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**Embodied in Life: The Lived Experience of a Yoga
Practice in Relation to Pro-health Habits**

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Abstract

The objective of this doctoral study was to explore the influence of yoga on practitioners' lives 'off the mat', and the idea that yoga can be an effective tool to enable a person to self-regulate in the direction of pro-health habits (diet and exercise). A 'real world' approach focused on the lived experience of a yoga practice in a purposive sample of self-identified New Zealand yoga practitioners (n=38; 89.5% female; aged 18 to 65-years, with 60.5% aged 36 to 55-years). The research protocol captured data from yoga practitioners in the context of their own lives and practice, in order to access the subjective experiential narrative of yoga practitioners.

A primarily qualitative mixed-methodology was applied, using a Heideggerian hermeneutic phenomenological perspective in order to explicitly include the researcher's own experience, or shared meaning, of the research topic. The qualitative methods included in-depth semi-structured interviews (a subset of n=8) and an open-ended online survey. Quantitative methods included online outcome measures (health habits, self-efficacy, interoceptive awareness, and physical activity) in addition to practice component data (tenure, dose, yoga styles, yoga teacher status, meditation frequency) and socio-demographic data.

Four categories emerged from the participant narrative: impact (experiential downstream or flow-on effects of a yoga practice); health behaviour (interrelationship between yoga and pro-health habits); practice (the experience 'on the mat'); and internal landscape (an inner experience). Thirteen themes provided access to the concepts of self-regulation and mindfulness as an experience, including descriptions that captured both the external and internal experiences of practice such as embodied breath, a sense of grounding, and the ability to pause.

The majority of participants felt that their yoga practice facilitated pro-health habits (63% for diet; 92% for other exercise). Additional reported benefits of yoga included stress management, connection to community, and as a lens or filter through which to engage with life. The yoga practice was a self-sustaining positive feedback loop, experienced as self-regulation guided by an embodied awareness. Attunement to embodiment through movement, is the key narrative to emerge from this study. Through embodiment, movement can potentially elicit self-regulatory pathways that support health.

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Attestation of Authorship

"I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning."

Wendy L Reynolds

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Ethics Approval

Application number: 16/307

Ethics approval was confirmed by the Auckland University of Technology Ethics Committee (AUTEC) on 15 November 2016.

Appendix A includes both the initial approval letter and an amendment (1 May 2018).

Annual progress reports have been submitted to AUTEC throughout the project.

CHAPTER 1: INTRODUCTION

1.1 Thesis aims and objectives

The aim of this thesis is to explore whether habitual yoga practitioners experience any pro-health downstream influences of their practice 'off the mat' via their lived experience of yoga. From her own experience of yoga the researcher was curious to explore whether yoga has impacted practitioners' lives, i.e. the lived reality 'off the mat', and thus the questions that underpin this study arose from this curiosity. What is the lived experience of yoga 'off the mat'? Do the experienced effects of the practice differ between practitioners? Do yoga teachers experience the practice differently? Are practitioners aware of an expansion of yoga beyond their mat and into their lives and lifestyle choices?

To fully explore the 'off the mat' experience, and more specifically any experiences of pro-health influences, a mixed methodological framework was employed, with a primarily qualitative approach supported by quantitative measures. Qualitative in-depth semi-structured interviews for a subset of participants offer a phenomenological (experiential) lens, whilst an online survey provides demographic and yoga practice statistics alongside a broad thematic analysis across the dataset. Verbatim accounts enable access to a narrative of practitioners' subjective journeys and their unique lived experience of yoga. Emergent themes within the narrative data provide a window into any commonalities across the dataset, particularly with respect to practice tenure and pro-health behaviours or habits. Two research questions inform the analysis:

RQ1: How has a movement practice (yoga) impacted practitioners' lives 'off the mat'? i.e. the *experience* of the practice 'off the mat'; and

RQ2: Is there a relationship between adherence to a yoga practice and pro-health habits? i.e. practitioners' perspectives on the *relationship*.

By combining these two questions, the overarching research topic considers whether adherence to a yoga (movement) practice is experienced 'off the mat' as a positive self-regulatory influence on health behaviour. Thus, the objective of this study was to explore the idea that yoga can be an effective tool to enable a person to self-regulate in the direction of pro-health habits. The experience of yoga practitioners provides the context within which the questions are considered. Does yoga support lifestyle choices, and thus aid in the development of habits, that are pro versus anti-health?

The origins of this study emerged from the researcher's informal discussions with fellow yoga enthusiasts. These conversations often led to the topic of yoga seeping into practitioners' lives with experienced effects such as: being aware of the option to pause before responding, healthier lifestyle choices, improved relationships (with others and with oneself), improvements in physical and/or mental wellbeing, and even productivity gains at work. As the thesis will show, this experiential narrative is supported by studies demonstrating holistic health benefits gained from yoga, and by limited research on the experiences of yoga practitioners.

It was the researcher's aim to not impose a practice on participants, but to instead design a research protocol that captured data from yoga practitioners in the context of their own lives and practice. The protocol used a 'real-world' setting, rather than requiring participants to engage in a specific yoga intervention (Linnebank et al., 2018). Qualitative research on a lived experience of practice suits an observational or 'real-world' design with no prescribed change to participants' regular movement practice. The majority of yoga research to date offers pre-designed intervention 'sequences', and the literature is weighted towards studies seeking to relate specific yoga interventions to outcomes, considering which component(s) exert the most influence. The researcher supports the need to clearly identify the variables of a yoga practice, and thus collated practice details such as tenure, weekly frequency and duration (or yoga dose), and style(s) of yoga. Yet it is debatable whether a holistic movement practice can be teased apart to provide verifiable and repeatable outcomes across individuals, given that the act of selecting specific criteria for a practice or 'intervention' has an effect in and of itself, as with all research. The placebo effect and power dynamics between the researcher and the researched is a factor in all interventional studies. By exploring 'real world habit formation'¹, any insights gained have the potential to better inform the application of strategies within the context of individual's lives (Gardner et al., 2022).

¹Gardner et al.'s (2022) paper provides recommendations for the criteria of 'real-world' habit formation studies, and thus is much more prescriptive than this doctoral study given their emphasis on understanding the factors that may strengthen a habit, including the context. Rather, this study is aimed at capturing 'real-world' habit strategies, and seeking the participants' perspective regarding what may have supported (or strengthened) the formation of their habits.

1.2 Yoga

One of the classical texts often referred to within the Western yoga landscape — whether it forms part of a yoga teacher training (Powell, 2021), or a magazine article (Rosen, 2014) — is the *Yoga Sūtras* (or *Yogasūtra*) of Patanjali², a classical Sanskrit yoga philosophy text dating from around 400-200 BCE. A *sūtra* can be translated to a thread (Shearer, 1982), or a verse; though the brevity of each *sūtra* has led to various published commentaries espousing their own interpretations of the *sūtra*, each with the goal of capturing the essence beneath the words. Indeed, the dating of this primary yoga text continues to be debated, for example circa 500 to 201 BCE (Dickstein, 2017; Funes Maderey, 2018; Shearer, 1982) or 1 to 200 CE (Bryant, 2009) depending on the commentary. Maas (2013) provides evidence to suggest that 425 to 325 BCE fits with the timing of the philosophical underpinnings of the text; a timeline almost identical to the 400 to 300 BCE timeline suggested by Mallinson and Singleton (2017).

The 195 *sūtras* are often referred to as a path of yoga consisting of eight limbs or stages; almost a how-to guide to fully embrace a life committed to yoga. The eight limbs generally move from an external (limbs one to five) to an internal practice (limbs six to eight), commencing with the ethics of the *yamas* and *niyamas*, through mindful movement with breath, and on towards meditation and an integrated self. As such, the path of yoga can be understood as a progression from one limb to the next, as follows³:

- Limb 1: *yama* (control/respect for others) can be considered the five laws or ethics of life in the context of our relationship with others, namely *ahimsā* (nonviolence), *satyā* (truthfulness), *astēya* (non-stealing/honesty/integrity), *brahmacharya* (chastity/discipline), and *aparigraha* (non-attachment/non-grasping/non-greed).
- Limb 2: *niyama* (the self-disciplines) or rules for life to guard against self-destruction, consisting of *sauca* (simplicity/purity/cleanliness), *santosha*

² Vyāsa is most often considered the first commentator of Patanjali's work, though whether Vyāsa and Patanjali were one person, or whether Vyāsa was alive "a few centuries" after Patanjali is still debated among classical yoga scholars (Dickstein, 2017, p. 614). Maas (2013) — in his deep dive into classical Indian philosophy - hypothesises that Patanjali is likely his own commentator, to inform readers of his reasoning behind the succinct verses.

³ Adapted from Shearer (1982), Roy & Charlton (2019) and an accessible online database of historical documents and definitions (Hiemstra, 2022), alongside the researcher's own interpretation regarding relevance, given that *Sanskrit* terms have varied definitions according to the context in which they are used.

(contentment), *tapas*⁴ (purification/austerity), *svadhyaya* (introspection/self-study/refinement), and *isvarapranidhāna* (devotion/surrender to a higher purpose).

- Limb 3: *āsanas* (physical postures) for health, or to be more precise the term denotes a seat⁵, or seated posture.
- Limb 4: *prāṇāyāma* (breath control/practice) to enrich energetic resources. Also considered as the restraint or withholding of the breath.
- Limb 5: *pratyāhāra* (sense withdrawal) to not be controlled by the senses.
- Limb 6: *dhāranā* (focused or one-pointed gaze), a contemplation on one object or on the breath, i.e. release from distraction.
- Limb 7: *dhyana* (attention), denotes the start of meditation and the cultivation of focus in the midst of thoughts and emotions.
- Limb 8: *samādhi* (awareness), a state of unbounded awareness or absorption/trance. The latter is explained by Roy & Charlton (2019) as a sense of being “deeply rooted” (p. 291) and fully absorbed in the object of meditation.

A different perspective was offered on the J. Brown Yoga Talks podcast (Brown, 2016) in a discussion with Judith Hanson Lasater, a renowned yoga teacher and author of high regard⁶, whereby Judith raised an inquiry in reference to the first two limbs of yoga, the *yamas* and *niyamas* — or the ethical ‘rules’ of a life informed by yoga — that rather than perceiving Patanjali’s *sūtras* as goals to aim for, or rules to live by, perhaps Patanjali was simply recording the result of a disciplined yoga practice. In other words the *sūtras* may represent the experiential flow-on effects of yoga into a practitioner’s life; or to quote Judith directly:

⁴ *Tapas* can be a difficult term to understand. One explanation is to purify oneself through the heat generated by the physical and mental practice. Roy & Charlton (2019) assert that the yoga practice transforms the practitioner through the process of *tapas* as creative change.

⁵ Funes Maderey (2018) explains that *āsana* “creates the conditions for meditation” (p. 267).

⁶ Judith Hanson Lasater Ph.D., PT, and author of 11 books on yoga.

“[T]he ... yoga of Patanjali is not proscriptive⁷ (*sic*), it is descriptive of how an integrated person would be in the world. For example, an integrated person would not harm, ... [but] ... would honour the body...” (J. Lasater, personal communication, October 24, 2017⁸).

Similarly, Mallinson and Singleton (2017) note, whilst the word ‘yoga’ is nowadays indicative of a practice, historically the word denoted the goal (or the outcome) of the practice, such as the state of *samādhi* (the eighth limb), which is just one version of ‘yoga’. As such, considering participants’ experiences through the *sūtra* lens may shine a light on how the practice has been integrated into their lives and how they relate to the world. The specific aspects of the *sūtras* through which the findings are considered is informed by the literature and the experiential data.

Although Patanjali’s Yoga *Sūtras* can be applied to the current Western model of practice, as Lasater’s above interpretation clearly illustrates, this in no way asserts that the yoga of today equates to the yoga of Patanjali’s time. In contrast to the postural sequences practiced in modern studios in the West, the *sūtras* provided minimal information on the *āsanas* (Mallinson & Singleton, 2017). Indeed, Singleton (2010) suggests that ‘modern postural yoga’ be considered a ‘homonym’ to the classical practice alluded to in the *sūtras*, with “different meanings and origins” (p. 15), and puts forward the argument that classical and modern yoga (with its European gymnastic and fitness lineages) should both be considered in their own right. The researcher’s own experience of learning Patanjali’s *sūtras* as a teacher, and exploring different commentaries to inform the inquiry (both practice⁹ and research) informed the decision to use these ancient ‘threads’ to weave philosophy into the modern day lived experience of the study participants. Singleton’s

⁷ The *sūtras* as a guide or a system of rules/steps to follow would be prescriptive, versus proscriptive which refers to a sanction or “imposed restriction” (Merriam-Webster Incorporated, 2022c).

⁸ At the time of sharing this perspective, Judith had only spoken of this concept, i.e. had not yet published her ideas. As such, sincere thanks are due to Judith for her generosity in allowing her perspective to be included in this thesis. Her words aligned with the researcher’s felt sense — the impetus behind the research questions — that had yet to fully form into a narrative. Judith provided the words to flesh out that subjective feeling. Given the passage of time since the original communication, permission to include Judith’s perspective was gained in August 2022.

⁹ The simple description of *āsanas* in *sūtra* 2.46 offers an approach to the physical practice that facilitates steadiness and comfort (Mallinson & Singleton, 2017; Shearer, 1982). This concept of *sthira* and *sukha* — that can also be translated as stability and ease (Roy & Charlton, 2019) — is one that resonates with the researcher, such that it informs her approach both on and ‘off the mat’.

(2010) view that ‘yoga’ is forever adapting and developing within the context it is practiced in, is a reminder to situate the findings whilst being mindful that the practice is experienced anew by each practitioner. Indeed, Roy and Charlton (2019) go further by asserting that yoga is experienced ‘afresh’ every time a practitioner stands on their mat, yet still informed by the threads of yoga’s complex lineage: “... both present in the Now and linked to that ancient tradition of yoga.” (p. 12)

For this thesis, yoga is defined by the participants themselves, i.e. the study collates the yoga practice for each practitioner. The study seeks to determine if an habitual commitment to a yoga practice is experienced as a health-enhancing downstream influence off the yoga mat, moderated by a neural state that supports self-regulation. The term ‘downstream’ delineates a direction of flow — for example, from higher to lower centres of the brain (Noble & Hochman, 2019) — that offers a visual representation of a post-yoga neural state and/or the application of a yogic¹⁰, or yoga-informed, approach to life that may support self-regulation. Simply put, self-regulation denotes an intentional regulation of one’s responses (Baumeister & Vohs, 2018) and is a wide-ranging concept incorporating emotions, physiology, and behaviour, to name a few relevant themes (see Glossary on p. 265). More specifically, self-regulation in the context of this study refers to the process underlying the ability to sustain pro-health behaviours or habits. Furthermore, pro-health habits tend to be more unconscious, i.e. habitual, as a result of consistent learned and applied pro-health behaviours (Smith & Graybiel, 2016). Potentially, the yoga practice itself could be deemed a ‘keystone habit’, defined by Duhigg (2014) as a singular habit that elicits a cascade or a “chain reaction” of effects (p. 100). In other words, is self-regulation the cascade, flow-on or downstream effect that results from the practice of yoga?

The goal is that the participants’ experiential narrative can offer a contextual roadmap or, in simpler words, offer a guide to the path of yoga as lived by practitioners and situate the thesis within the contemporary¹¹ practice of yoga. Participant stories — in their own

¹⁰ The use of ‘yogic’ in this context is describing the approach as one derived from, or informed by, yoga philosophy. Thus, it relates to the term ‘yogi’, which is often misused in modern yoga vernacular to describe a male (yogi) or female (yogini) practitioner, when historically the term applied to ascetics or religious devotees, some of whom were advanced yoga practitioners (Mallinson, 2022). Yogi gained popularity over the term yogin (Singleton, 2010).

¹¹ The field of ‘modern yoga’ is beyond the scope of this thesis but suffice to say that research exploring the cultural progression of yoga over time is alive and well. For example, the Hatha Yoga Project on the history of ‘physical yoga’, undertaken by leading contemporary yoga scholars from 2015-2020, within the Centre of Yoga Studies at SOAS (School of Oriental and African Studies) University of London (SOAS University of London, 2022). A 2009 synopsis of the history of ‘modern yoga’ — that

words — can provide an entry point for the reader to the felt sense of the experience; to breathe life into the text, and assist the reader towards their own interpretation of the findings.

1.2.1 Researcher Reflexivity: A personal experience of yoga

Transparency and self-reflection are integral features of the methodological approach central to the thesis, namely interpretive phenomenology. As such, the researcher recorded her own synopsis in response to the question: What is yoga to me? A self-reflection was undertaken at the start of the research process (while developing the research proposal), i.e. prior to data collation, and in the final 3-months of writing up the thesis, to provide comparative reports at either side of the doctoral journey.

Self-reflection 1:

How I use yoga in my life changes daily, weekly, with the flow. But the constant, so for me the core meaning, of my yoga is the connection to why I'm here, how I can best serve. Through simply moving with breath, regardless of the yoga āsana that calls to me at any specific time. The focus on breath with movement brings me back to me, reminds me to be, and in the be-ing, the experiencing, that focus aligns my actions to the priorities in life.

Self-reflection 2:

My practice has evolved to be more receptive to my daily needs. Having been through an unexpected health journey, I have developed a compassionate approach to how and when I move, with a preference for little and often, rather than one longer session on my mat. Online yoga has become my go-to as I prefer to practice early in the mornings in my own space. I had shifted to online delivery before the pandemic, though I have noticed that the online platform I use expanded into a wider range of offerings as a result of the influx of members in the past couple of years. In my own practice, meditation has come to the fore, and my ability to feel into what my body/mind needs has developed further. Yoga has enabled me to retain a grounding

informed the questions under study —explored the physical (modern) versus spiritual (historical) emphasis, and concluded that modern (physical) yoga was gaining in popularity within India, and that embodiment research exploring the subjective experience of yoga was emerging (Newcombe, 2009).

structure (a consistent ground to return to). A constant amidst life (and global) change. I notice a subtle and gradual negative shift in my mental and physical state if I am not able to practice (which is a rare occurrence). Conversely, almost every time I step off my mat I notice an internal shift towards a more easeful experience of self.

These reflective accounts provide a concrete example of a shift over time towards an inherent sense of the type of movement the body and/or mind is craving, and towards a practice that is interspersed throughout the day to better respond to the needs of the moment. A greater emphasis on meditation also emerged.

1.3 Study Rationale

Whilst a research narrative is emerging around the utility of yoga as a self-regulatory tool, there is a need for studies to consider quantified physiological outcomes, interoception, and health behaviour (Sullivan et al., 2018). In line with the increase in participation in yoga globally, since 2016 there has been an increase in literature exploring the field of yoga and self-regulation (Odynets et al., 2019; Saoji et al., 2017), with the evidence provisionally supporting a yoga-autonomic paradigm. An aspect not addressed directly in the yoga literature is whether long-term practitioners feel supported (to self-regulate) by their chosen practice; a question posed directly to the research participants in this study. The aim being that this research will add to the emerging field of yoga and self-regulation by studying the experience of a downstream impact or influence of yoga 'off the mat' in practitioners who have adhered to a consistent practice.

Yoga tenure will be a key aspect considered in the exploration of yoga as a self-management tool for health. Self-regulation in the context of this research relates to adoption and/or adherence to pro-health behaviours or habits. Have committed yoga practitioners optimised their adoption of, and adherence to, health-promoting behaviours? And, if so, do practitioners consider yoga to be a tool that supports their self-regulation? The research will consider whether any pattern emerges between tenure and a flow-on experiential effect to practitioners' lives. For example, are self-regulation strategies, such as improved diet or stress-coping tools, established in practitioners as yoga tenure increases? Residing in a parasympathetic state offers a neural paradigm that can positively regulate response to internal and external cues associated with habit, e.g.

hunger and access to food, respectively (Sullivan et al., 2018). As noted, yoga appears to have an impact on the autonomic nervous system, with this link between body and brain covertly referred to as ‘mind-body exercise’ or “physical exercise executed with ...[an]... inwardly directed focus” (Archer-Eichenberger, 2004). This research will consider whether a committed yoga practice intrinsically supports the self-management of health, which may be indicative of parasympathetic influence.

Findings in relation to long-term adherence to yoga as a movement practice may be of use to the health and fitness industries in supporting clients to adhere to recommended exercises and regular physical activity, respectively. Yoga is a low-impact accessible modality proven to elicit wide-ranging positive effects, particularly with respect to reducing the stress response (Kiecolt-Glaser et al., 2011; Payne et al., 2015; Rocha et al., 2012). This research study aims to add to the literature that positions yoga not just as a treatment option for stress, anxiety, and depression, but as a low-cost preventative measure (Caplan et al., 2013; Rocha et al., 2012). Yoga could be promoted as a useful strategy against the epidemic of obesity¹² via its positive impact on stress reduction (Ross & Thomas, 2010); given the apparent “dose-response association between exposure to ... stress and risk of obesity” (Brunner et al., 2007, p. 835).

The Ministry of Health (2013) is focused on modifiable risk factors for ill-health, such as physical inactivity and poor diet, to reduce the burden of healthcare costs on future generations. For example, low levels of physical activity were estimated to account for 4.2% of health losses (estimated as disability-adjusted life years) in New Zealand (NZ) in 2006-2016 (Ministry of Health, 2013). According to the 2014/15 NZ Health Survey, adult physical inactivity was on the rise, with 1 in 7 adults partaking in less than 30 minutes of exercise per week, compared to 1 in 10 in 2006/7 (Ministry of Health, 2015); a statistic that informed the initial doctoral research proposal. The impact of the current COVID-19 pandemic on activity levels is considered in the Discussion chapter (section 5.4). Evidence-based tools to assist people towards the uptake and adherence of positive health behaviours have the potential to redress the balance towards a healthier NZ population. A key motivator that inspired this thesis was to hear from adherents to a movement practice (yoga).

¹² The prevalence of obesity (defined as a BMI ≥ 30) in NZ increased from 29% to 31% (approx. 1.1million people) between 2011/12 and 2014/15, with higher rates in socioeconomically deprived areas, and in Māori and Pacific peoples (Ministry of Health, 2015).

1.4 Yoga participation in New Zealand and globally

Yoga continues to expand in the West, with national and global participation rates consistently on the rise. The number of practitioners (teachers, teacher trainees, and yoga students who practiced in the previous 6-months) in the USA rose from 20.4 to 36 million since 2012 (Yoga Alliance & Yoga Journal, 2016). Potential barriers to practice need to be overcome in order to facilitate adherence to a movement practice. Looking at movement participation data in NZ collated by Sport New Zealand (from 2015 to 2022) provides local (pre-COVID) context. Firstly, in a 2013/14 nationwide survey of adult sport and 'active recreation' participation, Sport New Zealand (2015) found over 10% of respondents chose to partake in either yoga or Pilates (combined statistics) in the 12-months prior. In addition, yoga and Pilates (combined) were one of the twenty most popular activities for women (16.6% participation rate), and 4.5% of respondents (n=6,448) noted that they would like to try yoga and/or Pilates (Sport New Zealand, 2015). Secondly, survey data from 2019¹³ explored how adult New Zealanders (n=21,689¹⁴; 54.8% female; ≥18-years) moved their bodies (Sport New Zealand, 2020). The authors noted a downward trend in participation, e.g. the proportion of adults aged 18 to 34-years exercising for less than 30-minutes per week rose between 2017 and 2019. A difference by ethnicity was also clear, with activity levels lower in adult Māori, Pasifika, and Asians versus Europeans (Sport New Zealand, 2020).

Of note, the yoga/Pilates participation rate dropped between the two time points: from over 10%, to a consistent 8%¹⁵ (between 2017 to 2019) (Sport New Zealand, 2020). The most frequently reported barrier to participation (58% of respondents) in the later dataset was the need to prioritise other commitments, with more barriers recorded for females (mean 3.3) than males (mean 2.6) (Sport New Zealand, 2020). Beyond the NZ context, lack of time or childcare obligations featured in the interview data from a small-scale Norwegian study on long-term¹⁶ fitness centre members (n=21; 52.4% female; mean age 43-years), primarily from those in the participant pool who were caring for children at

¹³ As noted by the authors, the data used is from the Active NZ survey (collated January 2019 to January 2020 including 21,972 adults in total (72% active and 28% non-active) (Sport New Zealand, 2020).

¹⁴ Numbers relate to those participants who self-reported as being physically active in the prior 7-days (Sport New Zealand, 2022c).

¹⁵ Yoga/Pilates featured as the tenth most popular activity in 2019 (recorded for the prior 7-days) (Sport New Zealand, 2020).

¹⁶ Long-term membership being 2 to >10-years (Riseth et al., 2019).

home (Riseth et al., 2019). Accessibility was a key theme noted by the authors, with factors such as location (close to home or work) and easy parking or public transport options supporting attendance. The accountability of a paid membership and the time-bound feature of group classes were also related to adherence (Riseth et al., 2019). Motivators and barriers are explored in more detail in the following section, alongside access to the practice (including sociodemographic factors).

According to Munir et al. (2021), yoga has transformed into a marketable commodity¹⁷ that has grown alongside the fitness industry since the 1980s resulting in a 'desacralization', or 'Americanization', process that distanced the practice from its Hindu lineage in order for yoga to be more palatable to the Western market. Until recently the majority of yoga practitioners in America were female, white, educated, and 20-50 years old (Birdee et al., 2008; Park, Braun, et al., 2015). Encouragingly the picture is evolving, as 2012 statistics showed that young black females were the largest U.S. demographic to access yoga in the 12-months prior (Cramer, Ward, et al., 2016). The latest figures indicated a shift towards almost one third male practitioners and approximately 40% over 50-years old, combined with increased participation rates (Yoga Alliance & Yoga Journal, 2016). As noted above, from a NZ perspective movement participation rates do differ by ethnicity. Specific to yoga, adult participation rates reported in 2019 (for the 12-months prior) were 18% for Europeans, 16% for both Māori and Asians, and 14% for Pasifika. The gender difference being more evident, with a 25% and 9% yoga participation rate in females and males, respectively. Gender barriers feature in the next section.

1.4.1 Practice motivators and barriers

A 2012 Australian survey of yoga practitioners (n=2,567; 85.5% female; mean age 41.4-years) found the most common motivators to either initiate or adhere to a yoga practice were to improve fitness (strength and flexibility), and to reduce stress, anxiety, or depression (Penman et al., 2012). Similarly fitness, flexibility, and stress relief featured as motivators in the USA yoga industry survey noted prior (Yoga Alliance & Yoga Journal, 2016). Likewise, in their study of long-term practitioners (n=542; 93.4% female; mean age 42.2-years; 28.8% yoga teachers), Park et al. (2014) found exercise, flexibility and stress

¹⁷ A process, the authors argue, that was assisted by the changing discourse of the prominent US-based magazine — the *Yoga Journal* — towards consumerism and fitness ideals (Munir et al., 2021).

featured as key motivators.

An American survey (based on 2012 national health statistics) considered factors that predict yoga use, with 'disease prevention', improved energy levels, and alleviation of back pain and stress emerging as key predictors for almost 21 million yoga practitioners (who had practiced in the year prior) (Cramer, Ward, et al., 2016). Ross et al. (2012) found that a home yoga practice was the main predictor of health in their U.S. survey of over 1,000 randomly selected Iyengar practitioners (n=1045; 84.2% female; mean age 51.7-years), weighing in above yoga tenure or frequency on selected measures such as mindfulness and wellbeing. Commonly cited barriers to physical activity uptake are insufficient time or resources (Sport New Zealand, 2015). To counter these barriers, a home yoga practice requires minimal time or expenditure, though a practitioner would need to either feel confident in their ability or be able to access beginner-level online classes to instigate a home practice.

What cannot be ignored is that the majority of yoga practitioners (and thus research participants) identify as female, with the addition of a lack of diversity in both race/ethnicity (a white majority) and socio-economic groups (primarily populations with higher education). Barriers to male participation have recently come under the spotlight, with Cagas et al. (2021, 2022) exploring both why men do not participate, and their motives to partake in yoga. Their 2021 Australian paper collated interview themes (n=21; median age 35-years) and identified the main barrier to a yoga practice was men's preference for alternative movement modalities, particularly sports or training at the gym; though a few of their male interviewees with yoga experience did feel the practice offered benefits, e.g. stretching and/or core strength (Cagas et al., 2021). Not surprisingly, the second main interview theme was that yoga was a feminine activity, or at least the media representation was stereotypically feminine, and partaking in a class that was attended predominantly by women could be discomforting and even stigmatic for men, potentially exacerbated by the gendered "bloke" culture specifically noted in the Australian context (Cagas et al., 2021, p. 4). Ideas to reduce barriers to participation for men were to emphasise yoga as a cross-training activity, e.g. to facilitate sporting proficiency through increased range of motion, or as a rehabilitative modality (Cagas et al., 2021). The first of two later papers published by the authors offered a different lens on the topic of gender, by surveying yoga practitioners from Australia and the Philippines (n=546; 73.1% female; mean age 40-years) with a

minimum practice tenure of 3-months¹⁸ (practice frequency $\geq 1/\text{week}$) regarding their motivations to practice and their responses to three masculine norms¹⁹ (Cagas et al., 2022a). Respondents were categorised into three groups who either focused on the physical side of practice, the ‘psycho-spiritual’ aspects, or a combination of both, with the ‘exercisers’ — physically-focused practitioners — slightly more prevalent in males (29% versus 22.6%); those interested in all aspects of the practice slightly more prevalent in females (40.1% versus 34.1%); and spiritually-focused practitioners accounting for approximately 37% of the sample, regardless of gender (Cagas et al., 2022a). Interestingly, whilst the authors had found that emphasising yoga’s potential as a supplementary modality to other activities could reduce barriers to yoga for men (Cagas et al., 2021); the male yoga practitioners were more motivated (than their female counterparts) to do yoga because of this very reason (Cagas et al., 2022a). Of the male respondents, 32.6% were yoga teachers (versus the 6% of female respondents) potentially due to a response bias, which does limit the generalisability to male yoga attendees. However, the most motivated sub-group were practitioners with a combined interest in both the physical and spiritual elements of yoga, highlighting the potential of promoting an integrated practice to men, rather than simply an adjunct to sport.

Switching back to motivation, Cagas et al.’s (2022b) second paper using the same dataset (n=546; 73.1% female; mean age 40-years) focused on motivations to practice yoga. Teacher status stood out as being significantly associated with engagement in the mind-body integration and/or spiritual aspects of the practice, versus being motivated by the physicality of the practice, with the ‘exercisers’ being the youngest sub-group within the dataset (Cagas et al., 2022b). Of note, Cagas et al.’s (2022b) dataset was unusual, with almost two-thirds (62.5%) identifying as Asian (due to recruitment from both Australia and the Philippines). Whilst the authors acknowledged that memory recall may have impacted the data — with participants providing information on their practice 3-months prior to the pandemic lockdowns — a strength of the study was the extent of practice components collated, including tenure, frequency, duration, and location. The data

¹⁸ Recruitment was before the COVID-19 pandemic, thus not impacted by the implications of access to in-person yoga classes. The authors acknowledged the limitation of not asking whether yoga was the primary movement practice of respondents (Cagas et al., 2022a).

¹⁹ Masculine norms were items selected from a measurement tool (Conformity to Masculine Norms Inventory-46) with the three norms deemed relevant to the paper being emotional control, heterosexual self-presentation, and self-reliance (Cagas et al., 2022a). The male respondents were more likely to control their emotions, and were more uncomfortable about being considered gay for attending yoga, whilst self-reliance was similar across both genders (Cagas et al., 2022a).

showed similar percentages for practice frequency regardless of teacher status (Cagas et al., 2022b). Those who preferred guided classes mainly attended a yoga studio (70.5%), rather than a fitness setting (14.3%); whilst 90% of those who practiced without guidance had a home practice (Cagas et al., 2022b). The dominant yoga styles were Ashtanga and Vinyasa, both of which have a strong physical element to practice, which may have positively biased the physically-motivated practitioners (Cagas et al., 2022b).

Whether motivation changes with tenure, and how motivation impacts sustained practice, remains unclear. Yet, over twenty years ago Rothman (2000) outlined a theory of behavioural maintenance aligned to expectations: “To the extent that people’s experiences meet or exceed their expectations, they will be satisfied with the behavior and motivated to maintain it.” (p. 66) Perhaps the combination of an achievable expectation matched with self-efficacy is a recipe for adherence. Even populations new to yoga can find the practice supports them in making healthier choices, simply by gaining confidence in their own self-management and/or making health a priority (Cheshire et al., 2022); and one would expect an equivalent increase in pro-health behaviour with other movement modalities that are offered in a supportive environment, particularly if sustained adherence is encouraged²⁰.

1.4.1.1 Accessibility of yoga

A recent narrative is emerging with respect to the unequal access to yoga in the West, resulting in a lack of diversity within yoga communities and, therefore, in yoga research. The dial has started to shift alongside a cultural focus towards social justice issues. For example, Webb et al. (2020) considered the access, or lack thereof, for diverse populations or “marginalized social identities” (p. 365). The authors noted that underrepresentation in yoga (including yoga research) can be addressed via media representation, e.g. of diverse ethnicities, ages, and physical abilities; by yoga providers (teachers and studios) considering how to increase inclusivity; and promoting inclusive research (Webb et al., 2020). To note, the increase in accessibility to online yoga platforms consequent to the COVID-19 pandemic will feature in the Discussion (section 5.4).

²⁰ The yoga intervention studied by Cheshire et al. (2022) provided participants with information on local yoga classes post-intervention.

Ease of access facilitates the integration of a practice into one's life. As Cagas et al. (2020) noted in their scoping review of yoga studies (n=88), ease of access to classes, coupled with yoga to suit the individual, supported participation. Of the reviewed studies, 43% (38/88) included barriers to yoga practice, with 29% reporting lack of access to a studio, and/or appropriate parking or means of transport (Cagas et al., 2020). In addition, lack of finance was a factor in 10% of the studies (Cagas et al., 2020). A small-scale (n=5; 60% female; mean age 31.4-years) qualitative study based in the USA interviewed yoga practitioners' experience of social inclusion and/or barriers to participation, with competing narratives of the yoga community being inclusive for 'anyone', or alienating to those who do not fit the "white and affluent female" demographic²¹ (Smith & Atencio, 2017, p. 1175). Even the location of yoga studios in more affluent areas has the potential to exclude a socially diverse demographic, with a requisite for participation being a "resilience to access yoga" (p. 1180) in order to experience the practice whilst identifying as a minority within the yoga community (Smith & Atencio, 2017).

1.5 Yoga as a practice on and off the mat

Yoga 'off the mat' is a term used by practitioners and the media in reference to yoga's consequent effect on lives beyond the practice itself (Abrams, 2018). The experience of yoga's downstream impact is evidenced by studies demonstrating health benefits such as improved dietary habits (Alexander et al., 2013); increased physical activity beyond yoga (Bryan et al., 2012); improved social engagement via self-regulation of pain (Cramer et al., 2013); and improved sleep (Lundholm et al., 2014). A self-regulatory influence on positive lifestyle choices, such as exercise (in addition to yoga) and diet, was supported by the 2016 industry survey of yoga practitioners [n=1,707] in the USA (Yoga Alliance & Yoga Journal, 2016). Research, albeit limited, on the experiences of long-term yoga practitioners adds support (Birdee et al., 2008; Ding & Stamatakis, 2014; Kiecolt-Glaser et al., 2011; Park et al., 2014; Penman et al., 2012). Sustained practice has a tendency to change practitioners' inherent motivation from physical (e.g. fitness and flexibility) to spiritual and stress relieving outcomes (Park et al., 2014). The present research will explore yoga's scope of influence via the subjective experience of practice and practitioner

²¹ With respect to ethnicity, one interviewee identified as white; the remaining four identified as mixed, Asian, Latino, and African-American (Smith & Atencio, 2017).

narratives.

Yoga-centred research has hitherto explored concepts of psychology, neurology, interoception and self-regulation, and on occasion interwoven the historical yoga scriptures. The field continues to expand and open new corridors of thought. Of note, a similar debate is ongoing within the mindfulness field. For example, the relationship between mindfulness, defined as non-judgmental awareness, and health behaviour was explored by Gilbert and Waltz (2010) with respect to physical activity, diet, and self-efficacy. As the authors hypothesised, the level of mindfulness predicted all three variables.

The literature does question yoga's self-regulatory role, within and beyond the topic of health behaviour, for example considering pathways by which yoga may positively impact psychological health (Gard et al., 2014). Gard et al. (2014) discussed both top-down and bottom-up regulation, touching on autonomic inhibition of the sympathetic nervous system (SNS) via the hypothalamus-pituitary axis (i.e. top-down or neural influence), and the role of yoga philosophy (for example the concept of non-harming) on lifestyle choice (bottom-up or social influence). Parallels between yoga philosophy and neuroscientific models highlight the potential of yoga practices to regulate response from a philosophical and/or physiological perspective (Sullivan et al., 2018). Where psychological and neural states interrelate and interact is outside the scope of this research, albeit fascinating and relevant to health behaviour. The literature advocates for research to explore yoga as a potential behaviour change intervention (Büssing et al., 2012; McCall, 2013). By activating the parasympathetic nervous system (PSNS) — or more specifically the ventral vagal complex which has a calming influence that regulates our social engagement (Lucas et al., 2018) — yoga may positively change our relationship to both internal and external cues and thus our behaviour (Sullivan et al., 2018).

1.6 Relevant concepts

A range of concepts relevant to the research topic, and adjacent research fields, are outlined in this section, with the order not indicative of influence. The goal is to offer the reader a map of the overlapping contexts within which a yoga practice, and yoga research, sits.

1.6.1 Mindfulness defined

Given the interrelationship between the yoga and meditation literature — with the practices often conjointly studied²² — it is worth exploring the concept of mindfulness. Mindfulness is a concept borne from Buddhism. In fact it is worth bearing in mind that present moment awareness is just one of three elements of mindfulness — the other two ‘awarenesses’ being: acting with an ethical lens, and growing spiritually — that have been decontextualised from the philosophical and spiritual constructs of Buddhism (Lomas, 2016).

A paper of particular relevance to this study collated meditation practitioners’ own definitions, i.e. their lived experience of mindfulness, rather than looking to academic definitions (Alvear et al., 2022). Meditators responded to an open-ended online survey question that asked the following:

Using your own words: How would you define mindfulness? (Alvear et al., 2022, Measures section, para. 1)

All but one of the respondents (n=326 total; 72.7% female; mean age 50.2-years) answered the question, and almost two thirds (63.7%) identified mindfulness as their meditation practice (Alvear et al., 2022). Thematic analysis resulted in a range of definitions that included: mindfulness was an attitude of non-judgment; a tool to self-regulate (mind/emotions and attention); mindfulness was a state (with wellbeing, positivity, calm, and tranquillity used to describe this state of being); and mindfulness was a philosophy and/or lifestyle (Alvear et al., 2022). Mindfulness as a way of life also featured in an article by Lutz et al. (2015) that sought to provide an experiential framework, or as the authors called it a ‘phenomenological matrix’, to illustrate a multidimensional “continuum of practices” (p. 632) that mindfulness can accommodate, and a potential research tool on which to map unique practice styles and experiences of participants. Recent endeavours seek to explore mindfulness (and other cognitive) states via the use of computer modelling (Sandved-Smith et al., 2021). Yet the subjective inter/intra-participant experiences remain central to the understanding.

A good example of the range of concepts aligned to mindfulness is offered by a positive psychology website offering no less than 22 definitions from well-known meditation

²² The Literature chapter includes examples of studies on practitioners of yoga and/or meditation.

teachers/authors, organisations focused on disseminating mindfulness information, and dictionaries (Moore, 2022). The state of mindfulness is best described as a quality of simply being present in the moment, or a noticing of life as it is lived; a state that requires attention or awareness, i.e. being mindful is an active practice. Non-judgment and acceptance are often mentioned within definitions (Moore, 2022); but these terms best refer to a quality of allowing whilst being mindful, such that one can allow the moment to be as it is. The suggestion being that an equanimous — or self-regulated — response (within a mindfulness state) can create space to step back and consider how one could best approach a situation in one's life, distanced from reactivity.

Mindfulness has been described as a cyclical 'moment-to-moment process' whereby intention, attention, and attitude interrelate (Shapiro et al., 2006); and a 'mode of awareness' elicited by self-regulation of attention towards experience (Bishop et al., 2004). While meditation can include mindfulness techniques, one can mindfully do many practical activities, such as walking and noticing one's surroundings, or mindfully listening to a friend. Indeed, a yoga practice can be a moving meditation with a mindful approach. The state of mindfulness is more of an attitude that: "enables people to intentionally focus on what they experience in the moment with an attitude of openness, curiosity, and care." (The Mindfulness Initiative, n.d.) By practicing mindfulness, one can develop the capacity to be mindful more often. With this in mind, whether a yoga practice aids in the development of mindfulness is a question that the findings may provide answers to.

1.6.2 The breath (*prāṇāyāma*)

Thayer and Sternberg (2006) propose that yogic breathing is the key ingredient to activate the PSNS; while Brown and Gerbarg (2009) posit that *prāṇāyāma* (breath control or breath practice) improves neural plasticity, with a consequent increase in vagal tone²³ and heart rate variability²⁴ (HRV). A recent systematic review of slow breathing studies (n=15) found an association with increased HRV and parasympathetic dominance, and also suggested a link between breath modulation and positive "behavioural effects"

²³ Vagal tone measurement continues to be optimised, such as a technique published by Topçu et al. (2018) that separates the respiratory component of heart rate variability, i.e. respiratory sinus arrhythmia (or the variability of heart rhythm aligned with inhalation versus exhalation), in order to consider the cardio-vascular impact separately.

²⁴ HRV is an objective measure of physiological stress with a high variability between heart beats (the RR intervals) equating to a dominance of vagal influence, i.e. PSNS dominance (Altini, 2017).

(Zaccaro et al., 2018, p. 12) mediated by central nervous system or top-down regulation, though improved emotions and wellbeing are highlighted, rather than behaviour per se. The review authors do note the enhancement of neural flexibility through slow breathing practice (Zaccaro et al., 2018); with vagal tone being an indicator of autonomic flexibility (Kok et al., 2013; Kok & Fredrickson, 2010). Vagal tone has also been considered in relation to the so-called “silent inflammation” (p. 2) inherent to chronic disease states, with increased tone related to recovery from inflammation (Topçu et al., 2018). Equally, a 2017 narrative review of *prāṇāyāma* techniques considered sixteen articles from 1991 to 2017 focused on the psychophysiological effects (Saoji et al., 2017). Breathing techniques tended to increase both HRV (n=4 studies) and PSNS activity (n=1 study) with two exceptions being a fast-paced (and forced exhalation) breath technique known as *kapalabhati*, and right-nostril breathing (Saoji et al., 2017). Though studies are generally small-scale, a link between breath and autonomic function is apparent and the literature offers a hint of the interplay between *prāṇāyāma* and the autonomic nervous system; a ripe arena for future investigation.

Delving a little further into the research on *prāṇāyāma*, a 2011 study (n=10; 70% female; healthy adults aged 21 to 37-years) equated 5-minutes of left unilateral or bilateral nostril breathing to increased HRV (Fan et al., 2011). Whilst an earlier (2008) study compared alternate nostril breath versus right and left nostril *prāṇāyāma*, with results suggestive of differing impacts on the autonomic nervous system depending on technique, though the author’s emphasis was on blood pressure response (Raghuraj & Telles, 2008). Alternate nostril breathing or *nadi shodhana* (Cook-Cottone, 2015), a *prāṇāyāma* technique regularly taught in modern classes, offered the greatest impact, including increased HRV. Conversely, right nostril breathing showed a tendency to increase the sympathetic response, in line with the Hatha tradition of the right side of the body representing the sun and an energising quality (Raghuraj & Telles, 2008). Whilst there are published studies on a range of *prāṇāyāma* techniques, these often involve young adult (student) populations, such as Pal et al. (2014) who found that right side nostril breath increased sympathetic tone, versus a left (moon) side parasympathetic influence. It is worth noting that simply breathing through the nose may itself be a crucial factor at play in the autonomic response via olfactory stimulation, as can simply slowing the breath rate (Zaccaro et al., 2018).

1.6.3 Self-regulation, behaviour, and parasympathetic dominance

One of the questions underpinning this study (RQ2) asks whether a sustained yoga practice has a positive association with self-regulation, or — as defined earlier — supports adoption and adherence to pro-health behaviours or habits. A proposed shift to parasympathetic dominance²⁵ is a possible mediator by which a yoga practice may support adherence to a healthy lifestyle (self-regulation). Yoga can induce an acute parasympathetic shift (Markil et al., 2012). But this research will consider whether a consistent ‘dose’ of yoga is a supportive milieu for pro-health lifestyle choices.

The literature is replete with terms reflective of the role of the vagus nerve in governing the PSNS. Heart rate variability (HRV) — otherwise known as respiratory sinus arrhythmia (RSA) — is often discussed alongside cardiac vagal tone, which relates to an increase in HRV/RSA (Farmer et al., 2016; Kok & Fredrickson, 2010). Though recent commentary suggests that RSA is best understood as “an approximate index of cardiac vagal tone” Grossman (2022, July 7). In addition to vagal tone, ‘vagal dominance’ is a term indicative of a responsive autonomic system and can also be known as parasympathetic dominance equating to a parasympathetic shift (Gerritsen & Band, 2018). A responsive or flexible nervous system has been linked to increased self-regulation or self-control (Reynard et al., 2011; Segerstrom & Nes, 2007). Interestingly, the prefrontal cortex is an area of the brain associated with sympathetic inhibition (Thayer & Sternberg, 2006). This cortical region relates to behavioural responses, particularly with respect to diet (Jarczok et al., 2015; Thayer & Friedman, 2002); and thus suggestive of a wider neural network working in partnership with the vagus nerve.

Yoga therapy circles often refer to the polyvagal theory espoused by Porges (1995)²⁶ as a foundational model explaining autonomic regulation of the PSNS in response to the environment (Lutz, 2022; Sullivan et al., 2018). Put simply, yoga can create a space of safety by which the PSNS is upregulated; a process that can be facilitated by a trusted yoga therapist through a process of ‘co-regulation’ of the recipient’s physiological state (Porges, 2022). The polyvagal theory is currently under question within academic circles,

²⁵ An underlying physiological factor that can explain yoga being a mediator for self-regulation is heart rate variability (HRV). The study design did incorporate HRV as an objective measure of participants’ neural state. However, due to the size of the resulting project, this quantitative data has been excluded from the thesis. The HRV narrative is still included in this chapter to shine a light on the hidden potential of a parasympathetic shift induced by the practice of yoga.

²⁶ Polyvagal represents two distinct points of origin of vagus nerve fibres within the medullary region of the brainstem (Porges, 1995).

with an unresolved discourse²⁷ that contests elements of the neuro-developmental framework on which the theory is based²⁸. An alternative framework, the neurovisceral integration model, proposed by Thayer and Lane (2000) offered a perspective on dysregulation based on the failure of neural inhibition to downregulate the SNS. The authors' model was primarily based on the decreased HRV — indicative of sympathetic dominance — in general anxiety disorders (as just one example of emotional dysregulation). The model proposed that the cingulate cortex in the brain was responsible for integration of a mind-body (neuro-visceral) response, combining attention (cognitive information) with body signals (visceral information), with a negative feedback of affect (response) creating a cycle of dysregulation (Thayer & Lane, 2000). The neurovisceral integration model has been through two further iterations to account for advances in neuroanatomy and, in the latter paper, computational neuroscience or 'predictive coding'²⁹, whereby probabilities or algorithmic patterns predict neural function (Smith et al., 2017; Thayer & Lane, 2009). Thayer et al. (2021) most recently considered stress and aging through the lens of neurovisceral integration, asserting that emotion and stress regulation are intertwined, i.e. both are aspects of an integrated self-regulatory system. A shift over time, with age, towards sympathetic dominance, can be negatively impacted by stress, highlighting the benefit of self-regulation strategies (such as yoga) to increase stress resilience (Thayer et al., 2021). The authors noted a difference in emotion regulation by gender, potentially via a learned evolutionary behaviour-regulation that resulted in females adopting a parasympathetic (or collaborative versus combative) strategy when encountering a stressful situation. An interesting point that may be one factor influencing the predominance of females within yoga, i.e. movement practices incorporating a parasympathetic approach may be more appealing to females.

Meanwhile, the discourse around self-regulation requires a discerning eye as concepts evolve, adapt, and emerge. Self-regulation can be understood as control of impulsivity, not only with respect to behaviour, but also emotional reactivity and decision-

²⁷ The evidence questioning the polyvagal is still emerging, with the most recent update by Grossman clarifying the essential nature of the vagus nerve as a conduit between brain and body (Grossman & Deuring, 2022).

²⁸ The critique is beyond the confines of this thesis, given it requires an in-depth understanding of evolutionary neurodevelopment, but it centres around the polyvagal stance regarding the dual points of origin (and function) of the vagus nerve and an evolutionary explanation for vagal control of the heart that is specific to mammals (Berntson et al., 2007; Grossman & Taylor, 2007).

²⁹ Predictive coding can also be understood as a neural model of probability by which the brain predicts incoming interoceptive information based on prior perceived sensations (Schulz & Vögele, 2021).

making (Segerstrom & Nes, 2007). Self-regulation is primarily inhibitory in nature, and when depleted, e.g. after resisting the urge to respond in anger to a stressful event, the resultant state of 'ego-depletion' impacts the ability to sustain self-regulation, unless there is sufficient motivation to do so (Baumeister, 2014). Ego-depletion is a somewhat confusing term³⁰ dating back to the late 1990s (Baumeister et al., 1998). Yet it relates back to Freud's psycho-analytic perspective which surmised that choosing an action required energy, or as Solms clarifies: "... every human ego is the resultant of the effort to reach a balance among ... conflicts" (2018, p. 48). In other words, staying 'on task' and avoiding conflicting demands and distractions can result in a depleted energy reserve (Baumeister, 2014).

A simple metaphor is that self-regulation fatigue is akin to physical fatigue, in that once fatigue reaches a certain threshold, motivation and/or belief are no longer enough to sustain effort (Vohs et al., 2012). New habits are under conscious rather than unconscious control, labelled as 'intentional inhibition', which is a factor at play with respect to consuming self-regulation resources (Baumeister, 2014); the primary fuel source being glucose (Beedie & Lane, 2012; Gailliot & Baumeister, 2018). A healthier diet may indeed be another positive feedback loop for self-regulation, via an improved glucose metabolism³¹ (Gailliot & Baumeister, 2018). From an energetic perspective, a parasympathetically dominant state would require less fuel (glucose) than sympathetic activation, thereby freeing up self-control resources, and a possible explanation for the PSNS being a mediator of pro-health behaviour.

An inherent link between self-regulation and behaviour change was proposed by Audiffren and André (2014), whereby "both [the] adoption and maintenance of a new behavior (*sic*) draw on self-control resources" (p. 43). By applying Baumeister's model of self-control to exercise physiology, the authors explain how a positive feedback loop between chronic (long-term) exercise and self-regulation provides a self-regulatory framework by which a movement practice strengthens practitioners' self-control, and in

³⁰ To illustrate the potential confusion, ego relates to the sense of 'self' as separate (Merriam-Webster Incorporated, 2019), or a dual perspective. Patanjali's yoga *sūtras* offer a glimpse into the historical context of duality as the 'Self': the knower, the Seer, versus the seen. Another way of looking at ego-depletion, could be allowing the "feeling of 'I-ness'" (Patanjali, n.d., p. 123) to subside as one walks a yogic path; or as *sūtra* 2.25 asserts: "the Self is liberated from its identification with the world" (Patanjali, n.d., p. 106).

³¹ The PSNS is part of an "integrated 'fuel homeostasis' system" (p. 746): it plays a crucial role in glucose metabolism via the promotion of insulin release (Myers et al., 2021). Hence the colloquial term for the parasympathetic branch being 'rest and digest'.

turn supports ongoing adherence (Audiffren & André, 2014). In 2019, in collaboration with Baumeister, the authors presented their 'integrated model of effortful control' whereby they reasoned that the salience network – a neural network primed to respond to novel situations (Uddin, 2022) – was best aligned to effort management (André et al., 2019). While, following on from Vohs et al. (2012), Forestier et al. (2022) proposed the term 'self-control fatigue' as a temporary state due to insufficient energetic resources, lack of motivation, and/or cognitive capacity to enact a self-control behaviour.

Finally, in another recent paper exploring the neural mechanisms that may support willpower endurance, the authors discussed the idea of optimising efficiency (via connectivity within the salience network) and improving endurance akin to training physical endurance (via repeated practice of tasks that require effort) (Audiffren et al., 2022). Thus moving towards a more 'effortless willpower' through cognitive training and neural optimisation; a term that Quirin et al. (2021) — informed by Kuhl and Fuhrmann's (1998) theory of volition³² — linked to self-regulation, though their emphasis was on making decisions aligned to one's 'integrative self', or personal values and self-directed goals.

The vagal tank theory (Laborde et al., 2018) offers an elegant metaphor for self-regulatory resources; the vagal tank symbolising an individual's ability to self-regulate, akin to the fuel tank of a car. A full tank equates to optimum cardiac vagal control (or vagal tone), evidenced by an increase in HRV — a measure of autonomic function (Zulfiqar et al., 2010) — and an associated responsiveness facilitating self-regulation appropriate to the environment (internal and/or external). In a similar vein, Beedie and Lane (2012) proposed an additional layer of individuality in the use of glucose for self-control, whereby resources are allocated in line with individual priorities. Or rather, repeated behaviours result in adapted efficiencies to increase the availability of the requisite fuel for desired actions, i.e. via neural adaptation to optimise self-regulatory processes (Beedie & Lane, 2012). This 'resource allocation model' of self-control simply directs the fuel to where it is needed, with the nuance being that the individual's resonance with an effortful task, such as a movement practice, will stimulate a "priority-drive redirection of resources" (Beedie & Lane, 2012, p. 149). This appears to be yet another line of enquiry that suggests

³² Self-regulation defined as "the task of maintaining one's actions in line with one's integrated self" (Kuhl & Fuhrmann, 1998, p. 15).

practicing any kind of movement that stimulates an interest, or (even better) is enjoyable (see section 1.7), can reduce the barrier of effort as a habit develops.

Following this train of thought, a plausible physiological explanation for yoga's impact on the uptake of positive health behaviours is its influence on the nervous system. Yoga has been shown to switch on the PSNS, or the rest and digest mode, of the autonomic nervous system (Thayer & Sternberg, 2006). Thus the premise that a long-term yoga practitioner will tend towards a parasympathetic state, with less SNS — or 'fight, flight or freeze' — activation. Yoga has an up-regulatory impact on the PSNS by increasing vagal or parasympathetic tone via activation of the vagus nerve (Thayer & Sternberg, 2006); resulting in a state of parasympathetic dominance. To note, physical activity in general improves vagal tone, though evidence suggests that strength training promotes the stress response post-exercise (Figueiredo et al., 2015; Lujan & DiCarlo, 2013). One theory as to how yoga impacts this autonomic switch, is via a reduction in allostatic load³³; a term that has been defined as the workload required of the body to return to homeostasis when confronted by stress (Kawachi & Allostatic Load Working Group, 1997). In simple terms, yoga facilitates the return to optimal homeostasis (Streeter et al., 2012); homeostasis being the dynamic state of equilibrium of all body processes requisite for sustaining life. This implies that yoga reduces the degree of stress response at a (neuro)physiological level, and the evidence does point towards a reduction in 'stress reactivity', as denoted by studies (n=22) reviewed by Pascoe et al. (2021) whereby cardiovascular and inflammatory biomarkers associated with stress responded positively to yoga.

A positive association between parasympathetic dominance and consequent increased HRV is well supported in the literature (Brown & Gerbarg, 2009; Ross & Thomas, 2010; Taspinar et al., 2014; Thayer & Sternberg, 2006). Furthermore an increase in HRV is evident regardless of yoga style (Lin et al., 2015; Markil et al., 2012); again suggestive of an association between yoga and parasympathetic dominance. For example, a parasympathetic state induced by yoga was supported by Ross and Thomas (2010) who reviewed twelve studies comparing yoga and 'exercise' in the context of effects on the SNS and the hypothalamic-pituitary-adrenal (HPA) axis. The HPA axis being "a fundamental part of the endocrine stress response" (Fink, 2010, p. 59). Ross and

³³ An ongoing autonomic imbalance toward the SNS is related to both morbidity and mortality (Thayer & Sternberg, 2006). The stress response is a complex system of interrelated mechanisms at multiple levels within the body, ranging from increased secretion of cortisol to surging emotions; the majority of which are subconsciously driven by the SNS. Responding to stress requires an active process towards homeostasis known as allostasis, thus allostatic load increases with stress (McEwen, 2007).

Thomas (2010) concluded that yoga down-regulates both the HPA axis and the SNS. A high HRV (over and above population norms) may be a mediator for self-regulation. Thus yoga, with the potential to shift practitioners more readily into a parasympathetic neural state — and an associated increase in HRV — may be a facilitator of self-regulation (and pro-health behaviour change) with consistent practice.

A relevant paper that considered both top-down and bottom-up cognitive processing, aligned self-regulation with the attainment of self-awareness (or an embodied mind) through yoga, making specific reference to *sūtra* 1.20 (Roche, 2018). Roche (2018) theorised that an understanding of the present moment as transient (a common teaching in mindfulness) is a contributory factor in self-regulation through acceptance, suggesting that psychological state affects the ability to self-regulate. A movement practice that induces positive emotions could be a key element that supports self-regulation, with evidence to suggest that exercise promoting a positive frame of mind is beneficial to “self-control capacity” (Audiffren & André, 2014, p. 44). More simply, the experience of a positive frame of mind post-exercise provides an impetus to repeat the activity; and if you enjoy a movement modality, you’re more likely to adhere to it. Hence the public health messages to find exercise that is fun (Flanagan, 2015). The evidence base for yoga indicates its positive impact on depression and anxiety (Kinser, Bourguignon, et al., 2014; Streeter et al., 2010; Yoshihara et al., 2011, 2014).

This doctoral study questions whether yoga supports self-regulation with respect to pro-health behaviour. The discourse is suggestive of behavioural mediators that may positively impact self-control. Sleep and rest, both related to the PSNS — and indicative of a reduced sensory alertness or disengagement from one’s environment (Recordati, 2003) — replenish self-control. More specifically, quality of sleep protects against depletion (Baumeister et al., 2019). Furthermore, being able to employ choice in how one applies self-control, such as selecting a movement practice that resonates — or that enables “express[ion of] the self’s preferences” (Baumeister & Vohs, 2018, p. 115)— can limit depletion; as for Beedie and Lane’s (2012) ‘resource allocation model’ with resources allocated towards priority (or preferred) tasks.

A further consideration is whether adherence to a movement practice, irrespective of modality, facilitates self-regulation; a so-called ‘virtuous circle’ described by Audiffren and Andre (2019) to represent a theoretical bidirectional relationship between effortful control and a regular movement practice. In essence, the authors propose that adherence to movement — also termed ‘chronic exercise’ (Audiffren & André, 2019) — supports

cognitive health, whilst the practice of ‘efforting’ (using cognitive resources) over time trains self-control such that the barrier to adherence is lowered, likely alongside neuroplasticity, i.e. an increase in efficiency, that simultaneously decreases the cognitive effort.

1.6.4 Interoception and embodiment

The burgeoning field of interoceptive and embodiment research may offer further insight into how yoga relates to adherence to pro-health habits. Clinical research using functional magnetic resonance imaging (fMRI) has provided a window into a complex neural network within the limbic (or survival) system of the mid-brain that maps the interoceptive state as an integral facet of homeostasis (Craig, 2002); an interesting concept suggestive of a link between neural mapping of sensation and maintenance of homeostasis. Motivation for behaviour change may be an unconscious homeostatic drive from within the neural interoceptive network; a drive of so-called “homeostatic emotions” (Strigo & Craig, 2016, p. 1). This link between interoception and homeostasis does explain (from an evolutionary perspective) how interoception and self-regulation connect (Farb et al., 2015). The feeling of being self-regulated equates to the concept of “embodied self-regulation” (Cook-Cottone, 2016, p. 2). Embodiment may thus be linked to pro-health behaviours simply via attunement to homeostatic needs and acting in accordance with the attainment of those needs (Cook-Cottone, 2016). Farb et al. (2015) hypothesise that self-regulation itself, with practice, may attune our “awareness of homeostasis” (p. 18), suggesting that homeostasis may underlie the felt sense that a behaviour has resulted in a positive outcome, such as a post-practice glow. Will participants experience, and/or will the data show, a link between embodiment and self-regulation (diet and overall physical activity)? Whether these two aspects are related, or at least whether a narrative emerges whereby practitioners perceive embodiment to be a factor at play, is one area of inquiry.

Interoception and embodiment research provides an internal lens on how a yoga practice may support adherence to pro-health habits. Interoception is simply (as the term suggests) the perception of one’s internal space; a ‘felt-sense’ or neural sensation-map of the body (Craig, 2002). Basically, a map “connecting ... body to brain to behavio[u]r (*sic*) and thought” (Cameron, 2001, p. 708). Porges (2011) goes further to label interoception as the sixth sense, or a “functional awareness” (p. 77); an unconscious process that can be consciously awakened. Different facets or ‘dimensions’ of interoception have been

proposed, including interoceptive awareness, sensibility and accuracy (Garfinkel & Critchley, 2013). Accuracy — also termed sensitivity (Garfinkel & Critchley, 2013)— is predominantly studied via a heart rate discrimination test whereby participants are presented with audio tones and asked to determine if the tones are in, or out of, sync with their own felt heartbeat (Ewing et al., 2017; Forkmann et al., 2016). Whilst interoceptive sensibility and awareness have been defined and studied as distinct features that were not correlated to the accuracy of participants' tracking their own heartbeat (Ewing et al., 2017; Forkmann et al., 2016); the similarity between definitions of sensibility and awareness³⁴ add complexity to this field of study (Mehling, 2020). There is also a need to move beyond cardiac interoception towards a more nuanced psychophysiological and whole body interoception, i.e. the felt sense of different bodily systems such as the gut, and/or specific internal organs (Forkmann et al., 2016). Whole body interoception fits the context of this study (a movement practice), with attention focused toward different spaces, places, and structures within the body, such as awareness of where the body is in contact with the floor and the contrasting feeling of expansion away from the floor. Mehling (2020) asserts that a “maturation ... of bodily awareness” (p. 254) is one of the central processes at work within mind-body practices. Indeed, in an earlier study, Mehling suggested that mind-body practitioners are motivated to practice due to their “innate tendency toward embodiment” (Mehling et al., 2011, p. 10).

Embodiment is a term often used synonymously with interoception, but in the literature a distinction is made. Embodiment or body awareness represents the *experience* of interoception, i.e. the conscious felt sense of being (embodied) is discrete from the unconscious (neural) mapping of the internal landscape (interoception) (Mehling et al., 2011). As such embodiment — or the awareness of interoception— best aligns with the experience of practice. At the unconscious level, interoception may play a part in the link between HRV and behaviour (Jarczok et al., 2015). Embodiment, in turn, can be linked to pro-health behaviours simply by attuning to the body's needs from a health perspective

³⁴ Sensibility has been defined as “a dispositional tendency to be internally focused” (Forkmann et al., 2016, p. 71) or a self-perception of one's own ability, i.e. self-efficacy or “self-perceived proficiency” (Ewing et al., 2017, p. 165). A self-perception element was included in a definition of interoceptive awareness proposed by a multidisciplinary panel whereby “body awareness ... includes cognitive appraisal and ... is shaped by ... attitudes, beliefs, [and] experience” (Mehling et al., 2009, p. 4). Garfinkel and Critchley (2013) differentiated the two via the method of assessment, with self-report measures for interoceptive sensibility, and a comparison of an individual's awareness of their own interoception versus an objective assessment of their accuracy for interoceptive awareness. For clarity, interoceptive awareness is used within this thesis to describe an individual's own awareness and/or perception of their internal landscape (as defined in the Glossary).

and acting in accordance with the attainment of those needs (Cook-Cottone, 2016). Embodiment could simply be an inherent guiding system that informs consequent behaviour in response to a felt sense of health.

The inclusion of interoceptive awareness as a measure may provide real life examples of a sense of embodiment coupled with pro-health habits. By processing the body's signals via an embodied awareness of one's own somatic state-of-play, one may experience a shift in response to sensation (Mehling et al., 2011). Further, by reflecting on the felt sense and any thoughts encompassing the experience, one can be motivated to change a behaviour in order to positively impact the feeling or thinking state using pro-health methods, versus numbing the signals with, for example, one's vice of choice. However, the social (external) environment cannot be ignored with respect to behaviour. Taipale (2014) expands the scope of embodiment to not only an internal landscape, but suggests that the very sense of being embodied creates a relationship to the external environment, be that people or place. While the effect of the external environment is an area beyond the scope of this thesis (also noted in footnote 121, p.75), the social element of a yoga practice may prove an interesting aspect of participants' experiences.

As noted, behaviour change may be motivated by an unconscious homeostatic drive from within the neural interoceptive network, potentially informed by an interplay between the unconscious (homeostasis) and the conscious (emotions) (Strigo & Craig, 2016). A further assertion places the body at the centre of experience — using the term “body-centrality” — to explain a “nuanced awareness of the body” (Menon, 2018, p. 162); an awareness that movement can enhance, and a description akin to interoception or embodiment. Menon even names the “inner awareness of the self” as yoga phenomenology (Menon, 2018, p. 161); a term not seen elsewhere in the literature, but one that appears to theoretically merge the experience of yoga with the concept of ‘being’ that sits at the heart of the phenomenological lens.

As noted above, Cook-Cottone (2016) termed the feeling of being self-regulated as an “embodied self-regulation” (p.2). Cook-Cottone's body of research sits within the subset of yoga research as it relates to eating disorders, with a focus on positive body image and recovery. Also working through this lens, Cox and Tylka introduced a model proposing possible mediators and moderators linking the practice of yoga to embodiment (2020). Whilst mindfulness and self-compassion are more obvious pathways towards a positive state of being, psychological concepts such as the flow state and body image

flexibility are included as potential skills that may be enhanced through yoga (Cox & Tylka, 2020). The experience of flow was coined by Csikszentmihalyi (2014) to denote a subjective state of immersion that fits well with the moving meditation that can emerge, particularly through repetition, within a yoga practice. 'Body image flexibility' enables an acknowledgement of discomfort (with oneself) whilst proactively engaging in actions (such as yoga) to support positive change; actions which may incorporate a self-compassionate approach (Sandoz et al., 2019). In fact, a movement practice may itself facilitate change via an "increased sense of [personal] agency" through exploration of changing sensations and/or thoughts/feelings during the practice (Farb et al., 2015, p. 17). Conversely, the development of self-compassion can lead to a greater sense of 'body appreciation' or acceptance, which in turn has been shown to support intrinsic motivation to engage in yoga, albeit in a young adult female population from the USA participating in a 2-weekly yoga intervention over 16-weeks (n=323; mean age 20.3-years) (Cox et al., 2019). What seems promising is that embodiment may be a means towards an internal appreciation of how one's body moves, versus how one looks, and thus support adherence to movement by the "internalization of physical activity movement" (Cox et al., 2019, p. 115).

Linking back to the PSNS, Jarczok et al. (2015) suggest that HRV may be linked to behaviour through interoception. Given that yoga directs one's attention to movement, breath, and an awareness of sensation to guide one's practice, the refinement of interoception (the neural recognition of sensation) is a core principle at play. As Farb et al. (2015) state: "Interoception [like yoga] is an iterative process" (p. 2). This iteration, whereby perception informs response, or in the context of a physical yoga practice, sensation guides movement, is developed through practice. Though research is limited, a recently published review of neuroimaging yoga studies (n=34) confirmed changes to neuroanatomy as a result of yoga; both structural (increased grey matter density) and functional changes (increased connectivity) to the insula, an area of the brain central to interoception (van Aalst et al., 2020). Evidence is emerging for an increase in body awareness as a result of practice tenure. A long-term Ashtanga³⁵ yoga practice (n=45 yoga practitioners³⁶; 66.7% female; mean age 40-years; mean tenure 5.8-years) was correlated to both compassion and body awareness via questionnaire responses in an Italian study (Fiori et al., 2017). Whilst a Canadian magnetic resonance imaging (MRI)

³⁵ Ashtanga is a specific style of yoga incorporating levels (or series) of set sequences that progress in physical intensity from the primary series or introductory level (Pattabhi Jois, 2010).

³⁶ A comparative control (n=45) was matched for age, gender, and educational level (Fiori et al., 2017).

study — although small scale (n=14 yoga practitioners³⁷; 64.3% females; mean age 37-years) — adds weight to this idea by suggesting that yoga tenure relates to a decrease in age-related decline of grey matter versus a comparative physically active control group; and regions of the brain associated with embodiment — such as the neural representation of the body, visualisation, and attention — increased in volume (Villemure et al., 2015).

Interoception may prove to be one explanation for the positive mental health benefits of a yoga practice, though the discourse is ongoing. Anxiety, depression, and other mental health conditions may be associated with a dysfunctional interoception consequent to beliefs influencing visceral signals (Khalsa et al., 2018; Smith et al., 2020). Given that yoga is a practice that can enhance interoception, perhaps it is through the continuous experience of interoceptive on the mat, i.e. in a neutral (or safe) space, that yoga can offer relief. In other words, the practice may enable the brain to construct a new emotional paradigm aligned to sensation (Barrett, 2017).

1.7 Adherence (in the context of pro-health behaviour)

The behavioural research field informs health policy globally, and the drive to understand the maintenance of healthy behaviours is key to reducing the health burden of twentieth century sedentariness and access to processed foods. Finding ways to close the intention-behaviour gap continues to be a research focus (Teixeira et al., 2022). Equally, moving along the behaviour-habit continuum is crucial for pro-health behaviours to become the automatic choice and forgo the cost (and potential risk) of making decisions in the midst of life. As Rebar et al. (2022) note, behaviour has a dynamic relationship with individuals (and their motivations) and context. A behaviour that is yet to become habitual is vulnerable to an individual's change in attitude or external challenges (Verplanken & Orbell, 2022). Consequently, adherence is associated with an increase in “perceived behavioural enactment efficiency” (Rhodes & Sui, 2021, p. 11). In other words, automaticity (efficiency) and adherence co-exist. Although other factors come into play to increase the chances of adopting a behaviour, such as enjoyment and identity (Rhodes & Sui, 2021). In fact, an upward spiral theory of lifestyle change equated pro-health behaviour to the associated positive affect, i.e. experienced during the behaviour (Van

³⁷ Again, a comparative matched control (n=14) was incorporated in the design (Villemure et al., 2015).

Cappellen et al., 2018). Indeed, it does seem obvious that enjoyment of an activity would lead to adherence. Finding a pro-health diet or movement practice that is enjoyable, or at least provides a positive emotional outcome, and fits within the context of a person's life, facilitates adherence. As does, connecting a behaviour to 'self-identity', i.e. identifying as a practitioner or, in a dietary context, as someone who chooses to eat nutritious pro-health food (Verplanken & Orbell, 2022).

In the context of enjoyment, a 2022 prospective survey of UK adults (n=285 total; 1:5 ratio male to female; mean age 46.8-years) who attended health promotion clinics at their GP practices showed that affective attitude could predict 'healthy eating'³⁸ behaviour over a 10-year period, though at the 10-year mark over 75% of the respondents had dropped out (Conner & Norman, 2021). Affective attitude³⁹ being particularly impactful on behaviours that acutely change one's physiology, like eating (and movement), and assessed by respondents choosing whether a healthy diet was either pleasant/enjoyable or unpleasant/unenjoyable (Conner & Norman, 2021). This line of research could support adherence to health promotion interventions, if — as the authors assert — they are specifically targeted towards facilitating a positive affect towards the pro-health behaviour. Or, conversely, taking time to understand an individual's preferences.

Similarly, Teixeira et al. (2022) found enjoyment to be positively associated with movement habit, adherence intentions, and exercise frequency. Based on a Portuguese survey of health club members (n=273⁴⁰; 53.5% female; mean age 36.2-years; mean practice tenure⁴¹ 12.5-years), enjoyment also increased exercise tolerance, i.e. if the movement was enjoyable, a higher intensity could be tolerated (Teixeira et al., 2022). This finding is supported by a recent Brazilian study that considered participants' implicit associations towards various movement modalities and sedentary behaviours, e.g. whether they found an activity or behaviour enjoyable/relaxing versus unpleasant/painful,

³⁸ A healthy diet in this instance was defined as low fat and high fibre/fruit/vegetable consumption (Conner & Norman, 2021), despite recent health promotion messaging replacing low fat for healthy fats alongside a lower carbohydrate intake, particularly processed carbohydrates (Schofield, 2018).

³⁹ Williams and Evans (2014) discussed the interrelationship of emotions and health behaviour back in 2014, highlighting motivations driven by affect, namely craving/desire or fear, which help direct intrinsic motivations (arguably the most prominent health behaviour concept).

⁴⁰ Exercise habit was based on a sample of 215, due to loss of data (Teixeira et al., 2022).

⁴¹ Practice tenure in this instance equated to health club attendance, with movement practice ranging from solo activities, e.g. gym workouts, to group classes, or a combination (Teixeira et al., 2022).

prior to 7-days of measured activity⁴² in previously sedentary adults⁴³ (n=50: 70% female, median age 31.0-years) (Calado et al., 2022). The final evaluation (on day 8) incorporated a half-hour moderate-intensity exercise session to measure the participants' feelings about the exercise⁴⁴, with the finding supporting a positive relationship between implicit associations and participants' experience of exercise, i.e. an inherently positive view of exercise can equate to a more pleasurable experience (Calado et al., 2022). No relationship was noted between movement behaviour (in the recorded 7-days) and the exercise session response, which the authors suggested might have been from the homogeneity of participants' responses (96% perceived the session to be pleasurable), perhaps due to response bias given that the data from the sample's movement behaviour recorded a median of just 17-minutes of daily activity at the moderate to vigorous level (Calado et al., 2022).

What seems to be an essential factor in adherence is habit strength (Fleig et al., 2014; Kaushal et al., 2017). Fleig et al. (2014) assert that habit strength is indicative of available resources for self-regulation, which relates back to the concept of self-regulation or self-control fatigue (Forestier et al., 2022; Vohs et al., 2008). It also brings us back to the question of whether self-regulation is supported by practice tenure, and whether a shift to the PSNS plays a mediating role. Habit strength may offer protection against a decrease in exercise intention, and conversely may not be as influential when intentions are high⁴⁵ (Rebar et al., 2014). As noted earlier, the issue of exercise adherence is of paramount importance when it comes to prevention of ill-health and disease, yet the establishment of habits requires more than external support. This is clearly demonstrated by a controlled study of healthy adult fitness club members in the Netherlands (n=122; 68.0% females; mean age 42-years), that tested a 12-week programme offering monthly coaching sessions on goal-setting (Middelkamp et al., 2017). At the 1-year mark, only 3 of the 40 participants (7.5%) who were offered coaching were still classed as regular exercisers, despite the minimal criteria (≥ 30 minutes/week, intensity to increase breath rate or start to perspire), and almost half (47.5%) had dropped out by the end of the coaching

⁴² Participant activity was recorded via an accelerometer that was only removed to sleep (Calado et al., 2022).

⁴³ For inclusion, participants did not have a regular movement practice in the 6-months prior to the study (Calado et al., 2022).

⁴⁴ Using a Feeling Scale to measure pleasure versus displeasure on an 11-point Likert scale (Calado et al., 2022).

⁴⁵ Based on young adults in higher education (n=128, 59.4% female, mean age 21-years) (Rebar et al., 2014).

intervention (Middelkamp et al., 2017). This highlights the point made earlier, that identifying with an activity can support adherence (Rhodes & Sui, 2021). Thus, identifying the supportive factors at play may increase adherence rates, and thereby the efficacy of health promotion interventions. Or as Rhodes and Sui (2021) state: "... an understanding for whom, under what conditions, is the maintenance process most likely to occur is likely essential information ..." (p. 10).

The initial literature screen that informed the research design included a number of studies linking a yoga practice to pro-health habits beyond yoga. A 4-month randomised controlled trial (RCT) comparing yoga (Iyengar 90-minutes; 2x week; low intensity) and walking (1-hr; 3x week; moderate intensity) in menopausal women (n=164; mean age 49.9-years) noted that the yoga cohort were more likely to have increased their activity levels post-intervention (Elavsky & McAuley, 2007). Similarly, in a 2012 small-scale pilot RCT (n=27; 81.5% female; mean age 51-years), the authors suggest a bidirectional relationship between yoga and health enhancing behaviours (Bryan et al., 2012). Though the adult participants self-identified as physically inactive (<30minutes exercise, <2x week) in the previous 6-months, it is worth a mention given the relevance of its findings to the research questions posed (Bryan et al., 2012). Participants in the yoga cohort (n=15; 86.7% female; mean age 50-years) had a significant increase in their adherence to other forms of exercise, including gym use, versus the control (Bryan et al., 2012). Of particular note, this adherence was sustained 5-weeks after the 10-week protocol of yoga (Hatha; 60minutes/twice a week; average attendance 12 classes), with the yoga cohort recording an average of approximately 4-hours per week of additional exercise (Bryan et al., 2012). Wellbeing, exercise adherence and self-efficacy were all positively associated, with a sense of increased awareness around eating reported (Bryan et al., 2012). An additional factor that may enhance adherence, is an individual's outcome expectancy, i.e. a belief not only in one's own ability but in the efficacy of the modality to effect change (Flegal et al., 2007). And, as noted with self-control, emotions can play a part with adherence. The yoga cohort in the above pilot study reported an increased desire to exercise (Bryan et al., 2012).

With specific reference to adherence, a small-scale US pilot of sedentary adults (n=14; 85.7% female; mean age 58.6-years) suggested that the uptake of yoga can bridge the gap to an exercise habit, after a yoga intervention of only 2-months (and a 6-month follow-up) aimed at encouraging adherence to physical activity (Yang & James, 2016). Overweight or obese adults self-selected, with two groups randomised to either at-

home DVD practice or attendance at an instructed yoga class (Vinyasa; 90minutes per week; both cohorts) (Yang & James, 2016). The high retention rate (>70% at 6-months) is worth a mention, as is the fact that various modes of exercise (e.g. swimming and dancing) were undertaken during the 6-month protocol. The at-home group reported higher levels of exercise participation post-intervention, despite participants preferring a teacher-led class, though the limitations of self-report are acknowledged (Yang & James, 2016). The authors concluded that the at-home group had developed the habit of exercising on their own volition, so were thus better placed to continue this during the 4-months post-intervention (Yang & James, 2016); perhaps indicative of increased self-efficacy as a result of a home practice.

The effects of a 'combined yoga practice' — or integrated practice (as denoted in this thesis) — are discussed in the literature; that is a practice that incorporates *āsanas*, *prāṇāyāma*, and meditation (Chaya et al., 2006; Kinser, Elswick, et al., 2014). Two differing approaches offer interesting results. The first Indian study (n=104 total; 37.5% female⁴⁶; mean age 33.5-years) found that an intensive 6-month yoga retreat had an inhibitory effect on basal metabolic rate, postulated as an adaptation due to reduced SNS activity (Chaya et al., 2006). In the second USA study of females (n=27; mean age 43.3-years) with major depressive disorder, the yoga intervention itself was just 8-weeks duration, but positive effects were apparent in the long-term (n=9; one year post-intervention) with almost all participants retaining elements of yoga as coping strategies, e.g. breathing techniques, irrespective of whether they sustained a yoga practice (Kinser, Elswick, et al., 2014).

The literature advocates for research to explore yoga as a potential behaviour change intervention (Büssing et al., 2012; McCall, 2013; Wertman et al., 2016); to consider effects over the long-term (Chong et al., 2012); and referencing both physiological and behavioural impacts (Menezes et al., 2015). There has also been a call for qualitative studies of movement practices (Farb et al., 2015); and for studies to consider whether 'mindful' movement is a key difference between yoga and other movement modalities (Menezes et al., 2015). To conquer the impact of 'lifestyle diseases', i.e. ill-health resulting

⁴⁶ It is not unusual for Indian studies to have a greater proportion of male participants (due to the historical culture of yoga noted elsewhere in the thesis). The yoga group (n=55) were compared to a non-yoga group (n=49) who volunteered at the retreat, thus reducing the effect of context on the results (Chaya et al., 2006).

from poor diet, stress, and/or a lack of exercise, it is essential that positive health habits are adhered to.

More recently, behavioural researchers (from Australia, UK, and USA) keen to translate research into effective pro-health policies are seeking to gain a consensus within the field on movement adherence (Dunton et al., 2022). Aside from adopting a more standardised language (and measurement) of adherence, the authors recommend learning from addiction research by incorporating adherence (or behaviour maintenance) success and failure, in order to explore steps along the behaviour change journey where individuals may encounter vulnerability and disengagement with their movement practice (Dunton et al., 2022). A clear example of adherence challenges emerged from a qualitative study of a UK pilot yoga intervention (offered via GP 'social' prescription) for a population (n=240; 52.5% female; mean age 53-years) either at risk of cardiovascular disease, pre-diabetes, and anxiety/depression, or feeling socially isolated (Cheshire et al., 2022). A study worth mentioning given that it was aimed at a prime population within which to promote a movement practice to prevent potential chronic ill-health (physical and/or mental), with 48% reporting their health status as either fair or poor. Whilst this was a short-term yoga protocol (10-weeks; class frequency 1/week; class duration 2-hours), participants were encouraged to start a home practice through the provision of handouts, videos, and a course manual (Cheshire et al., 2022). The home practice was offered as a mat or chair practice of 'short or long' (unspecified) duration to further facilitate adherence (Cheshire et al., 2022). At the 3-month follow-up questionnaire, participants were asked about adherence barriers and facilitators. As Rhodes and Sui (2021) also noted, enjoyment featured as an important measure of adherence to a home practice during the intervention, and to a post-intervention practice (Cheshire et al., 2022). Barriers included the 2-hour time commitment, and a class that felt too challenging; whilst adherence was supported by perceived positive benefits, and the continuation of social connections enabling ongoing practice in the community (Cheshire et al., 2022). The authors' recommendation to support the transition from intervention to ongoing adherence was access (location/affordability) to classes applicable to different abilities (Cheshire et al., 2022). This need to accommodate ability matched the findings of Teixeira et al. (2022), whereby movement adherence was facilitated by both enjoyment and the appropriate intensity. Tolerance was shown to moderate habit and frequency (Teixeira et al., 2022). Therefore, finding a movement practice that is both enjoyable and suited to an individual's capacity would best support adherence.

1.8 In Summary

This doctoral study explores yoga's potential influence as a positive lifestyle choice in its own right, and in facilitating additional pro-health behaviours. By investigating the influence of yoga on the self-management of health and wellbeing through lived experiential accounts of the practice, this research aims to add to the growing body of evidence for yoga as a potential health intervention strategy to facilitate the adoption and, most crucially, adherence to pro-health behaviours in order to develop sustained healthy habits. The current debate within, and adjacent to, the research topic is explored in the Literature chapter.

CHAPTER 2: LITERATURE

2.1 Aim of review

The narrative review situates this doctoral research within the current literature and ongoing debates relevant to the concept of self-regulation as a result of a consistent, habitual yoga practice. A systematic narrative approach has been used, seeking out literature specific to yoga practitioners, and/or exploring key topics across adjacent fields of study, in order to map the narrative to date. Section 2.2 of this chapter explains the chosen review methodology, whilst Section 2.3 outlines the search strategy, inclusion/exclusion criteria, and the protocol employed to categorise the resultant articles. The layout of this chapter is guided by concepts and subject terms relevant to the research questions⁴⁷ that underpin the study to keep the narrative ‘on point’ while surveying the literature landscape, rather than following a chronological approach (Ulin et al., 2005). Underlying this review is a desire to explore the current narrative regarding adherence to yoga, and whether a yoga practice is an effective tool to support pro-health habits, such as diet and being physically active. Specifically, does the literature present ideas relevant to the topic under study, and from a broader perspective, how do adjacent research fields approach the topic?

A prior scoping review that informed the final research design was undertaken in 2017 to provide an overview, or the lay of the land, from which the research questions arose. The literature sourced for this chapter was selected initially from a 5-year period (Jan 2017 to Jan 2022 inclusive), with additional sources incorporated up to the end of May 2022⁴⁸. The most relevant or ‘niche’ literature is tabulated to provide a clear overview of the published research that most closely relates to the research topic. Contextual research, from overlapping and adjacent fields of study, informs the narrative alongside earlier studies that add to the discourse. This chapter concludes by summarising how the research topic relates to the source literature, and clarifying the niche within with this study fits.

⁴⁷ **RQ1:** How has a movement practice (yoga) impacted practitioners’ lives ‘off the mat’? **RQ2:** Is there a relationship between adherence to a yoga practice and pro-health habits?

⁴⁸ A small number of references published after this review (June to August 2022) have been included in the thesis were relevant and are noted as such.

2.2 Narrative review methodology

A narrative approach to the literature review provides a descriptive synthesis of the relevant source material on the experience of yoga and its influence on practitioners' lives. Narrative review methodology was considered appropriate for the task at hand, given the central tenet is experiential study: "The most defining feature of narrative inquiry ... is the study of experience as it is lived." (Clandinin & Rosiek, 2007, p. 69) Narrative inquiry or narrative research is a qualitative approach informed by descriptions or narratives of experience (Pinnegar & Daynes, 2007). Whilst it is a research methodology, rather than a review methodology per se, it offers an approach to the source material that seeks to place participant experience front and centre, enabling a story of the current relevant discourse to be woven around the experiential data. Of note, Clandinin and Rosiek (2007) refer to a theory of experience espoused by John Dewey in the 1930s, by which an experiencer is both passively experiencing, and actively engaging with others and their environment, whilst also reflecting on the experience. A Deweyan experience thus incorporates the social landscape (including the researcher-participant dynamics⁴⁹), and the context of the experience (time and space) (Clandinin & Rosiek, 2007). Cultural and personal understandings are interwoven with the primary (direct) and secondary (reflective) experiences (Dixon, 2020).

The ideas and concepts underlying the research questions provided the lens (topics and subject terms) through which to approach the literature. Use of a standardised critical appraisal tool to systematically evaluate the key (or 'niche') articles adds rigour to the review process, as does transparency of inclusion criteria to limit selection bias (Ferrari, 2015). By drawing out the key narrative threads within prior yoga studies and adjacent research fields, the review aims to establish the current discourse and position this research within it. In summarising the narrative, the use of language evoking a "shared habitus" (p. 107) — or a common experience — of yoga 'off the mat' will be considered, both across the literature and from the researcher's viewpoint, to inform the hidden narrative of the writer behind the review (Jones, 2004). The embeddedness of the researcher is considered an advantage for a narrative inquiry, enabling subjectivity and personal experience of the subject matter to inform process (Craig & Huber, 2007). The

⁴⁹ The researcher-participant dynamic is one item considered via a qualitative critical appraisal tool for the 'niche' studies included in this review.

researcher's perspective ultimately guides the presentation of the review (content and order of narrative).

2.3 Search strategy and categorisation of source material

This section details the sequential process undertaken to source literature relevant to the research questions and decisions made regarding inclusion and categorisation. The aim being to provide a transparent and replicable strategy.

2.3.1 Inclusion and exclusion criteria

The search criteria was initially set at a 5-year date range from January 2017 to January 2022 — i.e. literature published since the scoping review — with an age criterion of 18-65-years, and a focus on peer reviewed human studies in English. The date range was eventually extended beyond 5-years, to incorporate source material up to and including May 2022⁵⁰. A range of relevant databases within the health subset were sourced via the AUT University library — EBSCO Health, Scopus, AMED Allied and Complementary, Cochrane Library via OVID, Google Scholar — with the addition of thesis-specific sites both locally (AUT Tuwhera Open Access Theses & Dissertations) and globally (ProQuest Dissertations & Theses Global). The key search terms used were:

- yoga, yoga practice, yoga practitioner
(combined with “AND”)
- adherence, habit, health behaviour, interoception, movement practice, philosophy, prāṇāyāma, self-regulation, tenure
(excluding “NOT”)
- covid⁵¹

⁵⁰ The search endpoint was timed to coincide with thesis submission. To note, on occasion papers accessible online in May 2022 had a future publishing date, e.g. July 2022.

⁵¹ Due to the proliferation (and prioritisation) of COVID-19 related research since the emergence of the pandemic in 2020, it was necessary to exclude literature that had an emphasis on the use of yoga to alleviate COVID symptoms and/or improve immune response.

A proximity search was also completed to consider literature with 'long term' and 'yoga' situated within five words of each other, using a near (n) or within (w) operator, e.g. long term n5 yoga. A resource that proved effective in sourcing additional material was Semantic Scholar⁵², a platform launched in 2015 that offers an efficient tool to be notified when key papers are cited. Furthermore, ResearchGate⁵³ was useful for staying up-to-date with researchers active in the appropriate fields, with the advantage of access to pre-print articles and open source discussions/questions.

The process of screening literature took place between July 2021 and June 2022. The first of four screens was undertaken in July/August 2021. A total of 159 articles were collated for consideration from their title/abstract, after the removal of 63 duplicates from an initial article count of 222. A review of the 159 full articles excluded any studies focused on yoga for specific health conditions, and any yoga that was a short-term (acute) intervention (<6-months). The review's inclusion criteria were qualitative experiential studies, and articles focused on yoga (or holistic movement) practitioners, their practice, and any effects thereof. In addition, contextual studies were collated, e.g. comparable qualitative methodology to the thesis, adjacent fields of research, the social context of yoga (e.g. accessibility, global participation/demographics), and systematic reviews of relevant concepts and/or studies. Occasional secondary references proved to be an additional resource from the selected literature, as did database search alerts. Three further literature screens took place in December 2021, February 2022, and May 2022.

2.3.2 Categorisation of search results

Relevant literature was tabulated on two Excel spreadsheets for mapping key ideas and concepts: a 'niche' subset that appeared to address the research topic more directly, and a second 'contextual' subset that considered the wider conversation, such as mindfulness, barriers and facilitators to practice, health behaviour, and interoception. Once the first 50 articles had been marked for inclusion, context, and exclusion, they were peer reviewed (by the primary supervisor) to confirm the screening process. Across the review, specifics of each study — namely participant number, gender, and mean age

⁵² Semantic Scholar — <https://www.semanticscholar.org/> — is a free, AI-powered literature tool designed "to extract meaning and identify connections from within papers" (AI2 Allen Institute for AI, n.d.).

⁵³ ResearchGate — <https://www.researchgate.net/> — is another free online platform started in 2008 as ResearchGate GmbH.

(where provided) — have been included for consistency. However, as the data is reported in its published format, the specifics do differ slightly, such as median versus mean age.

The ‘niche’ studies of best fit to the research questions included one or more topics relevant to the research questions (such as diet or physical activity, outcomes ‘off the mat’, and/or long-term yoga adherence/practice). The final quotient (n=12) of ‘niche’ articles are collated in Table 1 with pertinent details including study design and yoga practice tenure. Five of the ‘niche’ articles explored the qualitative experience of yoga practitioners (or in one case yoga teachers) via interviews. The remainder were primarily surveys, with one meta-analysis. One of the niche studies incorporated two papers analysing the survey data and interview subset respectively (Mace & McCulloch, 2020, 2022).

To increase objectivity, the five experiential papers were evaluated using a Critical Appraisal Skills Programme (CASP) qualitative appraisal tool (2018) designed exclusively for qualitative research studies. Ten questions (or criteria)⁵⁴ are designed for researchers to systematically consider research rigour within the context of a qualitative approach (Critical Appraisal Skills Programme, 2018). The CASP (2018) checklist provides a critical viewpoint from which to consider the qualitative and experiential (phenomenological) approach, i.e. exploring the experience of a yoga practice. Table 1 records the number of positive responses to the CASP evaluation questions, i.e. a score out of ten. Overall the five experiential articles fulfilled the CASP criteria: stating clear research aims that warranted a qualitative approach; using a research design, recruitment strategy, and data collation method(s) fit for purpose; considering potential researcher bias and/or influence with respect to participants; providing confirmation of ethics approval; providing enough detail to show rigour in their analysis; and clearly articulating their findings and relevance/contribution of the research (Critical Appraisal Skills Programme, 2018).

⁵⁴ CASP evaluation questions to consider robustness of study design and findings: 1) Was there a clear statement of the aims of the research? 2) Is a qualitative methodology appropriate? 3) Was the research design appropriate to address the aims of the research? 4) Was the recruitment strategy appropriate to the aims of the research? 5) Was the data collected in a way that addressed the research issue? 6) Has the relationship between researcher and participants been adequately considered? 7) Have ethical issues been taken into consideration? 8) Was the data analysis sufficiently rigorous? 9) Is there a clear statement of findings? 10) How valuable is the research? (Critical Appraisal Skills Programme, 2018).

Table 1

Description of 12 'niche' articles most relevant to research questions

Author(s) Journal	Date	Title	Study design / Population	Yoga Tenure + Practice Details	CASP Evaluation Score out of 10 Noted Limitation(s)
Cramer et al. <i>Journal of Psychosomatic Research</i>	2017	Is the practice of yoga or meditation associated with a healthy lifestyle? Results of a national cross-sectional survey of 28,695 Australian women	Large-scale survey (n=28,695; 100% female) Australia	No tenure data Practice frequency data for prior 12-months (never/rarely/sometimes/often)	N/A
Kishida et al. <i>Complementary Therapies in Medicine</i>	2018	"Yoga resets my inner peace barometer": A qualitative study illuminating the pathways of how yoga impacts one's relationship to oneself and to others.	Interviews ⁵⁵ (n=12; 100% female) USA	Mean tenure 7.42-years (SD 5.57)	9/10 Single coder; no mention of researcher's interest in yoga
Watts et al. <i>The International Journal of Behavioural Nutrition and Physical Activity</i>	2018	Yoga's potential for promoting healthy eating and physical activity behaviors among young adults: a mixed-methods study	Survey (n=1820) with interview subset (n=46; 73.9% female) USA young adults	No tenure data Practice frequency data for prior 12-months (≥30minutes yoga per week in past year identified as practitioners ⁵⁶)	10/10
Cramer et al. <i>Complementary Therapies in Medicine</i>	2019	Associations of yoga practice, health status, and health behavior among yoga practitioners in Germany: Results of a national cross-sectional survey	Survey (n=1,702; 88.9% female) Germany	Mean tenure 12.72-years (SD 9.95) Yoga teacher status (58.2%) and practice component data	N/A
Wiese et al. <i>International Journal of Yoga</i>	2019	Effects of Yoga Asana Practice Approach on Types of Benefits Experienced	Survey (n=2,620; 84% female) USA & global	81% tenure ≥4-years Consistent practice (41%) Yoga teacher status (60%)	N/A
McKinney <i>International Journal of Yoga</i>	2020	Determinants of Maintaining a Daily Yoga Practice: Health Locus of Control and Self-determination Theory Perspective	Survey (n=100; 68% female) India, Ireland, Holland	Av. tenure 6.43-years (SD 4.9) Only Ashtanga practitioners	N/A

⁵⁵ Interviews were informed by themes generated by a prior online survey (n=107; 92.6% female) (Kishida et al., 2018).

⁵⁶ A practice frequency of <30minutes per week (or no yoga) in the past 12-months classed as a non-practitioner (Watts et al., 2018).

Author(s) <i>Journal</i>	Date	Title	Study design / Population	Yoga Tenure + Practice Details	CASP Evaluation Score out of 10 <i>Noted Limitation(s)</i>
Sala et al. <i>Health Psychology Review</i>	2020	Trait mindfulness and health behaviours: a meta-analysis	Meta-analysis (n=31,697: 61.2% females) Based on 122 papers ⁵⁷ ; young adult median age	No tenure data 4 studies included yoga practice data; 2 studies yoga or tai chi frequency	N/A
Cartwright et al. <i>BMJ Open</i>	2020	Yoga practice in the UK: A cross-sectional survey of motivation, health benefits and behaviours	Survey (n=2,434; 87.3% female) UK	Mean tenure 13.9-years (SD 11.6) Yoga teacher status (37%)	N/A
Mace & McCulloch <i>Animals</i>	2020	Yoga, <i>Ahimsa</i> and consuming animals: UK Yoga Teachers' Beliefs about Farmed Animals and Attitudes to Plant-Based Diets	Survey (Phase 1) (n=449; 87.5% female) UK yoga teachers ⁵⁸	No tenure data	N/A
Campeau-Bouthillier <i>Anthropology and Medicine</i>	2021	Bodies in yoga: tangled discourses in Canadian studios	Observations/Interviews (n=21; female majority ⁵⁹) Canada	No tenure data	8/10 <i>No detail on thematic analysis methods; no recommendations re application of findings</i>
Cox et al. <i>Journal of Women & Aging</i>	2021	A qualitative study exploring middle-aged women's experiences with yoga	Interviews (n=21; 100% female) USA	No tenure data Participants self-identified ⁶⁰ as either experienced in yoga or a beginner/novice	10/10
Mace & McCulloch <i>Worldviews</i>	2022	Yoga Teachers on Consuming Animals: Dietary Journeys, Barriers to Veganism, and Negotiating Ahimsa	Interviews (Phase 2) (n=9; 88.9% female) UK yoga teachers	22.2% (2/9) tenure >10-years; 44.4% (4/9) tenure 4 to 6-years; 33.3% (3/9) tenure 1 to 3-years	9/10 <i>No participant data on yoga teacher training or regularity of teaching</i>

⁵⁷ Countries within which studies were undertaken were not stated, but the impact of ethnicity to the association of mindfulness and health behaviour was considered (Sala et al., 2020).

⁵⁸ Eligibility criteria were residing in the UK and completion of a yoga teacher qualification (with no practice details collated) (Mace & McCulloch, 2020).

⁵⁹ Descriptive statistics for the interviewees were not provided, including no identification of gender, though only two male practitioners were quoted in the paper (Campeau-Bouthillier, 2021).

⁶⁰ Participants were not provided with any definitions regarding the classification of either experienced in yoga or a beginner/novice; rather it was left to the participants to choose the label that they felt best applied to them (Cox et al., 2021).

2.4 Narrative review: Yoga and pro-health habits

This review is organised according to the relevant narratives (or themes) within the published literature. Section 2.4.2 presents the narrative on yoga's influence 'off the mat', i.e. relevant to RQ1⁶¹. Section 2.4.3 focuses on practice adherence and pro-health habits, i.e. relevant to RQ2⁶². The 'niche' literature is weaved into the review, but firstly, a brief overview of the approaches and key topics addressed by the 'niche articles' (Table 1) is warranted.

The 'niche' articles span the review timeframe (from 2017 to 2022) and include studies across the globe, from Australia, Europe, the USA, Canada, and India. Of the five experiential articles, one also incorporated a survey. A meta-analysis considered health behaviours from a mindfulness lens and was the only article included that was not specific to yoga (Sala et al., 2020). Six papers were surveys of a yoga practice, both practitioners and/or teachers. Two of the published papers (Mace & McCulloch, 2020, 2022) were Phase 1 (survey) and Phase 2 (interview subset) of a single study of yoga teachers. Similarly, one of the five experiential studies combined survey and interview (subset) data (Watts et al., 2018). Tenure data was collated in half (6/12) of the studies. Of the five studies evaluated by the CASP criteria, only one lacked transparency with respect to their thematic analysis (Campeau-Bouthillier, 2021). The percentage of female participants across the niche studies ranged from 61 to 100%, mirroring the higher female demographic within yoga highlighted in the Introduction chapter.

2.4.1 *A yoga practice and practitioner defined*

The primary focus of this thesis is the lived experience of a yoga practice, yet a confounding aspect within the field of yoga research is the wide range of characteristics that define a yoga practice. Despite the word 'practice' being suggestive of a regular weekly (if not daily) commitment, a yoga practice (for research purposes) may be as little as 30-minutes per week (Kristal et al., 2002; Neumark-Sztainer et al., 2017; Watts et al., 2018); or be defined as participation in yoga in the past 30-days with no confirmation of

⁶¹ **RQ1:** How has a movement practice (yoga) impacted practitioners' lives 'off the mat'?

⁶² **RQ2:** Is there a relationship between adherence to a yoga practice and pro-health habits?

practice components⁶³ such as tenure (Forseth et al., 2019). Self-identification as a yoga practitioner by research participants is a central feature within studies, as a common route to participation is through self-selection criteria. Identifying as a yoga practitioner is suggestive of a commitment to the modality, rather than to a specific frequency or duration of practice. Equally, practice tenure may not be indicative of a consistent practice as demonstrated by Kristal et al. (2002) who defined tenure as the number of years practiced in the past 10-years, yet the minimum tenure category was labelled as an “abbreviated” (p. 29) practice that was sustained for at least 1-year (out of the 10). Thus whilst studies based on large national datasets — often comparing yoga versus non-yoga groups (Forseth et al., 2019) — appear robust from a statistical perspective, one needs to consider the criteria defining participation in yoga. Given that the specific practice components of source studies also differ greatly, careful consideration is required to ascertain whether there is sufficient yoga context to make sense of the findings. In fact, one of the ‘niche’ papers primarily considered mindfulness in relation to health behaviour. Furthermore, Sala et al.’s (2020) meta-analysis only featured 3.3% (n=4/122) of studies that collated yoga practice data (with a further two studies noting either yoga or tai chi practice frequency). Yet the paper was selected for review due to the fact it considered the ‘off the mat’ application of mindfulness to health behaviours, i.e. a mindfulness approach to life that bears similarities to a yogic approach.

To further confuse the issue, seated meditation studies and movement practices can both be labelled as yoga in the literature. For example, Travis (2018) denotes yoga as an inner state of being whereby over time practitioners experience an “integration of Yoga — inner silence — with outer activity” (p. 36), i.e. the application of a practice to daily life. Although the author refers primarily to a specific modality of meditation (transcendental meditation), rather than a movement practice, his definition of combining inner quietude with action could equally fit the experience of relating to the world after having moved and breathed on one’s yoga mat (Travis, 2018). This integration is similarly defined by Menon (2018), with reflection on the outer world and introspection of the inner world both considered parts of a yoga practice. Deciding whether to delineate yoga and meditation as dualistic concepts of mind-body, or to integrate them as visible (yoga) and invisible (meditation) elements of the practice is a topic discussed by O’Brien-Kop and Newcombe (2021). An integrated approach sits well with this thesis, given that data was collated on

⁶³ Practice components refer to the descriptors of a practice, e.g. tenure, style of yoga, frequency, or location.

both aspects of practice. Ultimately for the purposes of this study, the practice — with or without a meditative element — is defined by the participants' experience within a modern NZ context.

2.4.1.1 Experience of the practice

An emerging discourse considers the lived experience of a yoga practice via a wide range of research approaches. For example, a Canadian ethnographic⁶⁴ study (n=21; no gender identification; aged 18 to 82-years; varied practice tenure) considered practitioners' embodied experience over 18-months (Campeau-Bouthillier, 2021). The lens through which Campeau-Bouthillier (2021) considered participants' experiences was yoga as a 'health practice', defined as "health and healthy bodies in the context of yoga" (p. 360). Concepts such as 'working the body' captured the experience of participants interacting with their bodies, from releasing locked areas, to responding to the body's needs, to using the extremities as focal points (Campeau-Bouthillier, 2021). Participants also shared their experience of using visualisation to better perceive internal structures (interoception), and feeling into the body (embodiment), with individual agency and self-regulation themes (Campeau-Bouthillier, 2021). The author concluded that the yoga practice was experienced as a work in progress, with the body as a project aimed (perhaps) towards an ideal, or at least a healthier version.

From the same journal issue — focused on the narrative between health and yoga — an editorial by Shaw and Kaytaz (2021) explained that the impetus for the issue was the expansion of the 'yoga industry' worldwide into a 'health and wellness' practice. Following an overview of the dissemination of 'modern postural yoga'⁶⁵ in the West, the authors assert that the context within which the practice (and the research) sits needs to be explicit. Hence their anthropological framework for research, whereby "health and wellbeing are socially and subjectively constituted" (Shaw & Kaytaz, 2021, p. 287). Equally Hauser (2021) — again from the same issue — used a concept of 'health imaginary' to

⁶⁴ Ethnographic methods included observations at yoga studios, semi-structured interviews with practitioners, and collation of visual body-maps drawn by interviewees (though only comments made by interviewees whilst creating the body-maps featured in this published paper) (Campeau-Bouthillier, 2021).

⁶⁵ Modern posture practice was coined by Singleton (2010), who defined it further as "transnational anglophone yoga" (p. 9-10) to depict the transmission of yoga in English from India to Europe. As such, 'modern postural yoga' is describing Western yoga that is primarily situated outside of the context of the Hindu and/or Buddhist lineage.

explore the comparative health discourse within postural yoga in Germany and India. Hauser (2021) defines ‘health imaginary’ as: “... a set of shared notions about health, the human body, illness causality, and ... healing” (p. 298). Or, in other words, a social construct of health within which yoga sits. The author highlights the narrative of yoga postures as therapy and/or self-care, including the “medicalization” (Hauser, 2021, p. 304) of yoga in India contrasted with yoga therapy offered in an *ashram*⁶⁶ environment in Germany. The social, subjective, and contextual elements of research are, however, applicable to qualitative methodologies beyond anthropology. Yet, the reminder that lived experiences and ideas (such as health) are framed by context — and the contextual discourse — ensures that research findings, e.g. themes, are situated beyond the confines of the study. As such, yoga is one modality within a wide range of modern-day self-care practices that facilitate health autonomy, where access is available. One such population with access were the middle-aged women from the USA who featured in Cox et al.’s (2021) study (see section 2.4.2.2). Themes of healthful or self-care behaviours and increased mindfulness emerged from participant interviews, with participants using mindfulness ‘off the mat’ in different ways, from simply reducing anxiety through the focus gained during practice, or better management of stressful situations and/or the associated mental narrative (Cox et al., 2021). Pro-health behaviours influenced by yoga also featured.

A further expansion of the practice is the journey from practitioner to teacher, a topic explored by Liu et al. (2021) who consider the transformation from yoga as a leisure pursuit to a leisure career, or as they frame it ‘devotee work’ — defined as “self-enhancing work” to which “devotees feel a ... strong positive attachment” (p.2). Using a grounded theory approach, interview data⁶⁷ from Chinese yoga teachers (n=15⁶⁸; females aged 23 to 48-years; av. practice tenure >9-years) was coded via a constant comparative method (using themes from relevant literature as the comparator) (Liu et al., 2021). The authors described a thematic progression from casual to serious leisure pursuit, i.e. the development of a committed yoga practice, and thus to the professional pursuit of teaching. The peak of the leisure career was equated to the concept of ‘devotee’ work, at

⁶⁶ An *ashram* is a retreat designed for attendees to be fully immersed in religious or spiritual practices (Merriam-Webster Incorporated, 2022a).

⁶⁷ Recruitment was via purposive sample during the COVID-19 pandemic, and thus interviews were virtual (Liu et al., 2021).

⁶⁸ Three of the participants both taught yoga and owned a studio; three solely owned a studio (yoga/Pilates/fitness); a further seven identified as yoga teachers (n=5 full-time; n=2 part-time); whilst two no longer identified as a teacher/studio owner (Liu et al., 2021).

which point teachers may expand towards the business side of yoga (Liu et al., 2021). Of note, practicalities of teaching (and the corporate side of yoga) can result in a teacher reverting back to simply being a practitioner, or just teaching casually, which was the case for a third of the study's participants, indicative of a bidirectional relationship between leisure as a pursuit versus a career (Liu et al., 2021).

2.4.2 Yoga's impact 'off the mat'

The impact of yoga 'off the mat' refers to any effects experienced by practitioners in their daily lives. Within the parameters of this review, a key topic of interest was whether practitioners feel supported by yoga to make pro-health choices. An underlying premise of 'support' attests to the self-regulatory effects of yoga, and the literature does consider yoga's self-regulatory role within and beyond the topic of health behaviour. For example, an equanimous response to life appears to emerge in yoga practitioners over time, i.e. correlated to practice tenure; a potential theory being that: "Through repeated yoga practice, there is a resulting skillful optimization of autonomic control in response to stressors on and off the yoga mat" (Gard et al., 2014, p. 13). Gard et al. (2014) proposed a model of mechanisms or mediators that may explain the self-regulation of psychological health by yoga as a result of movement, breathwork, meditation and/or yoga philosophy. The authors discussed ideas ranging from autonomic inhibition of the SNS via the hypothalamus-pituitary axis, to the role of ethics within yoga philosophy on lifestyle choice — a role that features within the literature on yoga and dietary preference (section 2.4.3.3).

Gard et al.'s (2014) premise is supported by Cramer et al. (2019) in their survey of German practitioners, whereby the study of yoga philosophy (at a 1/week frequency) was correlated with health behaviour, after controlling for sociodemographics (including age, gender, and employment) and chronic illness. For example, a vegetarian or vegan diet⁶⁹ was present within the cohort (n=1,702) at a level six times higher than the general population (Cramer et al., 2019). As the authors point out, yoga may entice those who have an interest in health; in which case, a positive feedback loop of ongoing health habit change via a philosophical stimulus may be present. Similarly, Mace and McCulloch

⁶⁹ Discussed in section 2.4.3.3 in the context of dietary preference.

(2020, 2022) found a link between the philosophy of *ahimsā*⁷⁰ — one of the limbs espoused by Patañjali, commonly equated to the Buddhist concept of ‘non-harming’ — and UK yoga teachers’ adoption of a vegetarian or vegan diet. Yoga research that explores self-regulatory outcomes in relation to concepts from psychology, neurology, interoception, and (occasionally) historical yogic texts, is a burgeoning area that continues to expand and open up new corridors of thought.

2.4.2.1 Spirituality

Spirituality emerges as a theme within the yoga and wider contemplative research fields. Spirituality is, given its internal focus, a subjective term that is experienced uniquely by individuals in relation to both internal and external (social, including religious) settings. Although the external drivers of spirituality do factor into an individual’s experience; spirituality is, in essence, primarily an internal experience. As such, though spirituality may encompass a sense of connection, it is different to a social connection with others (which features in the following section). Within the context of modern Western, or postural, yoga, a useful definition is an integration of contemplation into the practice (Sarbacker, 2014); an integration that most likely develops over time.

To add complexity, spirituality is often defined by the study (e.g. a survey question) rather than the participants. As an example, a 2014 survey of yoga teachers⁷¹ (n=156; 93.4% female; mean age 42.2-years) questioned whether the reasons for continuing to practice had changed, or whether new reasons had emerged over time (Park et al., 2014). The vast majority of teachers (85.8%) reported a change from their initial motivation to try yoga, with a corresponding positive correlation between a change in motivation and teachers’ practice tenure. Furthermore, a sustained yoga practice had a tendency to change inherent motivation from the physical to the spiritual flow-on effects, with almost 45% (44.4%) noting spirituality as their primary reason to practice spirituality⁷². Yet what spirituality meant to the participants remains unclear, and one must query whether

⁷⁰ *Ahimsā* is often translated as ‘non-harming’ or ‘non-violence’, which includes not harming animals in order to eat. But a wider definition of *ahimsā* denotes a state of being, or an approach to life, that centres on a “loving openness” to all of life’s situations (Shearer, 1982). Satapathy (2016) goes further by considering the position of various commentaries on Patañjali’s *sūtras*, by which *ahimsā* can encompass avoidance of suffering (in all its forms, including that of animals and of oneself).

⁷¹ The study also included 360 yoga students, but the spirituality concept was most apparent in the teacher subset (Park et al., 2014).

⁷² 16.4% of students reported that spirituality was their current primary reason to practice (Park et al., 2014).

'spirituality' would have arisen without it being a prompt amongst a list of possible responses to the question: "What was the primary reason you continued to practice yoga?" (Park et al., 2014, p. 3). Spirituality also featured as an important shift in practice focus of respondents (n=2,434; 87.3% female; mean age 48.7-years) to Cartwright et al.'s (2020) UK survey. Again, the specifics were vague, with the authors highlighting a shift towards a "more holistic psycho-spiritual approach" (p. 9) with tenure. Whilst Cagas et al. (2022b) found spirituality to be a motivator in practitioners (n=543; 73.1% female; mean age 40-years; Australia/Philippines) with a longer practice tenure, though 'mind-body integration' was a stronger motivator in their study (as noted in the Introduction chapter), potentially due to the concept being a more acceptable entry point to practice than spirituality.

In a 2019 systematic review of 30 primarily quantitative studies (83%; 25/30) that specifically explored how yoga and spirituality may interrelate, an attempt was made to distinguish spiritual elements, such as seeking insight, meaning, faith, and/or compassion (Csala et al., 2021). A third of the studies lacked a clear identification of participants' yoga experience, and the inclusion of clinical populations and spiritual/prison communities amongst the studies does muddy the water, yet the authors provide a robust discussion of the topic. An integrated practice, i.e. incorporating both movement and meditative aspects of yoga, versus a yoga intervention designed for a specific population under study, featured in just 16.7% (n=5) of the reviewed studies. An additional six quantitative studies were accessed to source the most recent evidence, with no change to the review's finding that regularity of practice was a key requirement for spirituality to emerge from yoga (Csala et al., 2021); a similar finding to that of Cartwright et al. (2020) noted above.

Spirituality, for some practitioners, may equate to enhanced mindfulness, which itself has been positively associated with pro-health behaviour in a meta-analysis of studies (n=31,697; 61.2% females; median age 28.3) that explored trait mindfulness (using data from standardised measures) and health behaviours, albeit with the limitation of between-study variability in defined variables and outcome measures (Sala et al., 2020). Trait mindfulness being distinct from 'in-the-moment', or state mindfulness, with respect to being a general approach to life over time (Sala et al., 2020). As noted earlier, despite the low percentage of yoga data included in the studies, the application of mindfulness to health behaviours was deemed relevant to the research topic. The authors found both physical activity and healthy eating were related to trait mindfulness, though interestingly the correlation between physical activity and mindfulness was negatively related to the

number of male participants in a study. Sala et al. (2020) explained that this gender influence on the correlation is most likely due to a lower rate of mindfulness practice in men. One single facet of mindfulness, acting with awareness, stood out as “the most consistent predictor” (Sala et al., 2020, p. 369) for pro-health behaviour. As noted in the Introduction chapter, Gilbert and Waltz (2010) found a similar effect from non-judgmental awareness a decade earlier.

A point of interest is provided by another study (n=84: yoga naïve females, mean age 22-years), again led by Csala, exploring the type of verbal cues offered by a yoga teacher (Csala et al., 2020). The aim being to compare a cohort offered cues based purely on the physicality of practice (n= 27) versus a cohort who also received spiritual and philosophical cues during class (n=23), with a comparative control group (n=34) (Csala et al., 2020). Whilst the findings are based on a young adult female (University) population and a short-term yoga intervention (10 classes; frequency 1/week; duration 90-minutes), the study found that the type of cue did not impact outcomes related to spirituality, interoception (or body awareness), and mindfulness in a yoga naïve sample (Csala et al., 2020). Improved spirituality occurred irrespective of spiritual cues, with the authors suggesting that the practice of yoga itself may be the stimulus for spiritual and/or psychological change. As Sarbacker (2014) asserts in his paper discussing the subtle spirituality within ‘modern postural yoga’:

The physical body ... is both an entry point into the practice of yoga and the place in which the spirituality of yoga is focused and expanded. It is a neutral point of reference, ... and ... an opening to the spiritual dimension of yoga. (p. 104)

Sarbacker’s (2014) quote is alluding to the idea that the process of embodying the physical practice may result in a spiritual transformation; consonant with the eight limbs outlined by Patanjali which can be interpreted as a progression through the physical realm of the third limb (*āsana*) to the final three limbs of *dhāranā* (steady mind), *dhyāna* (meditation), and *samādhi* (settled mind) whereby the mind transcends itself, or the “experiencer, experiencing, and [the] object of experience has been left behind” (Shearer, 1982, p. 74-75).

Sarbacker (2014) also points to the tendency to shift towards the philosophy and spirituality of yoga as a practitioner commits to the practice, and (as noted earlier) begins to ‘integrate contemplation’ within their practice. The development of a practice from practitioner to teacher may also impart different flow-on effects, or it may be that teachers

are simply more aware of any spiritual outcomes or relational benefits (emerging from a spiritual integration), such as compassion towards others (Wiese et al., 2019). Thus, connection to others developed through practice is a feature of the literature.

2.4.2.2 Connection

Another narrative that emerges is the concept of social connection developed through the group dynamic of yoga (as opposed to a home practice). In-person classes can provide a place away from home commitments that is dedicated to practice, with the added impetus of “social encouragement” (Cheshire et al., 2022, p. 9). Cox et al.’s (2021) USA study of middle-aged women⁷³ (mean age 56.5-years) who either classed themselves as experienced in yoga (n=12) or novices (n=10) felt that yoga provided a supportive environment (teachers, fellow practitioners, and/or community-feel of studio) that enhanced motivation to practice. In fact, the authors highlighted the importance of a supportive milieu to foster positive yoga experiences, and thus adherence. Likewise, a larger USA-based study (n = 542, 87% female; mean age 44-years; 30% yoga teachers) reported “psychosocial” (p. 3) outcomes from a yoga practice, such as connection with others (Park et al., 2015); matching the social connections highlighted by Cheshire et al. (2022) in their UK yoga prescription study demonstrating that, even in a short-term yoga intervention, the social aspect can emerge. Participants (n=240; 82.5% female; mean age 53-years) were prescribed a 10-week yoga intervention either for social isolation or for being at-risk regarding a range of physical/mental health conditions⁷⁴ (Cheshire et al., 2022). As noted, the authors found adherence beyond the intervention was supported by participants forming a socially cohesive group with whom they could continue to practice (Cheshire et al., 2022). It was not clear whether adherence differed depending on the reason for the yoga prescription, i.e. whether participants who were socially isolated were more motivated to sustain social connections (and thus yoga adherence). To note, the changing landscape of yoga class delivery since the onset of the COVID-19 pandemic, and whether connection can be achieved virtually, will be included in the Discussion chapter, to provide a current lens beyond this study’s pre-pandemic findings.

⁷³ As per the majority of samples within yoga research, the participants identified as white, and 90% were degree educated (Cox et al., 2021).

⁷⁴ As noted prior, the population was recruited from GP practices after being identified as at risk for “cardiovascular disease, pre-diabetes, anxiety/depression, or experiencing social isolation” (Cheshire et al., 2022, Abstract).

With a focus on relational outcomes of yoga, both in terms of relationship to oneself and others, Kishida et al. (2018a) developed a conceptual model of the dynamic interactions and possible pathways by which a yoga practice influences relationships. For example, the development of self-compassion and compassion for others via mindfulness, defined by the authors as a “nonjudgemental attitude and openness ... cultivated through yoga”⁷⁵ (Kishida et al., 2018a, p. 215). Their relational model was developed from female (n=12; mean age 49.3-years) interviewees’ descriptions of associations between concepts that emerged from the literature and participants’ own responses, suggestive of a co-creational (or participatory) research methodology. Initial themes derived from a USA-based online survey of practitioners recruited from yoga studios (n=107; 92.6% female; mean age 41.4-years) informed the interviews. Emergent themes of a grounded and aware state of being, and overall connectedness and/or community were evident from yoga practitioners with a practice frequency of ≥ 1 per week⁷⁶ (either home or studio) and a mean practice tenure ranging from 7.4-years (for the interviewee subset) to 8.2-years for the full sample (Kishida et al., 2018). The authors identified a progression from improved intra-relationship (to oneself) to improved inter-relationships (with others). An intra-relationship is likely more akin to spiritual outcomes, again suggesting that an improved connection to self develops, or expands, into better social connections as per Wiese et al. (2019). The small sample size and self-interested population (a common factor) is worth noting, but is likely to be representative of the dominant Western practitioner narrative. As noted in the majority of studies, access to different research populations⁷⁷, such as a range of socioeconomic and ethnic groups, would be advantageous for all research endeavours.

Relating to others features in a study by Dagar et al. (2022), who hypothesised that altruism — the act of benefitting, or acting positively toward others without need of a reward — would be facilitated by a yoga practice. Altruistic behaviour and compassion to others both fit under the umbrella of a sense of connection and/or service to others. But rather than using a compassionate perspective, the authors explored altruism as it related to subjective vitality, self-transcendence, and psychological capital⁷⁸, then considered the

⁷⁵ This mindfulness definition closely matches those discussed in the Introduction, where the question was raised regarding yoga’s potential to facilitate the development of a mindful state.

⁷⁶ Another example of a practice definition: inclusion required a yoga practice frequency of 1/week minimum (Kishida et al., 2018).

⁷⁷ The Discussion will consider the topic of accessibility to yoga.

⁷⁸ The three concepts (measured by validated self-report online questionnaires) can be defined as: having the energy to feel vital such that one can exert positive action (subjective vitality); to be aware of

influence of a short-term yoga protocol (7-weeks; frequency 2/week; duration 25-minutes). The context of management education within which the topic was explored does limit the generalisability, in concert with the fact that the study was based on a young, primarily male⁷⁹, sample (n=109; 12% female; av. age 24.2-years) of Indian management postgraduates, with no record of participants' prior yoga experience. On the plus side, the yoga arm of the study was a randomised controlled trial with twice weekly yoga (n=56) compared to a control group (n=53) that were offered a yoga 'alternative' (weekly self-reflection exercises and discussion) (Dagar et al., 2022). The study's findings did support yoga's influence on altruism, despite the short time frame, and provided a theoretical model by which altruistic behaviour may be mediated. In addition, longitudinal data (at the 4-month follow-up) provided a glimpse of yoga adherence, as almost three quarters had sustained their yoga practice after the protocol ended. The authors did note the limitations of a short-term study design, with the recommendation that access to experienced yoga practitioners could add depth to the findings (Dagar et al., 2022). The specificity of this population, with the intervention incorporated into a credited part of their education, both reduces applicability and increases the risk of response bias (to gain a good grade). However, this study was included as a unique example of how yoga may be applied well beyond the mat, as a means to — as the authors assert — cultivate altruism and ethics in management rather than a culture of self-centred competition (Dagar et al., 2022).

The cultivation of self-compassion is an interesting concept with respect to the research questions, given that it has a link to pro-health behaviour. A meta-analysis of associations between both physical health and health behaviour to self-compassion (n=94 studies; 2009-2019) provided evidence of the potential efficacy of targeting self-compassion to support health behaviour change (Phillips & Hine, 2021). The total sample pool (n=30,129⁸⁰) did contain a range of populations from adolescents to older adults,

one's place in the Universe (self-transcendence); and a blend of self-efficacy, optimism, hope, and resilience (psychological capital) (Dagar et al., 2022).

⁷⁹ As noted prior, a majority male population is more often seen in yoga studies undertaken in India, most likely a residue from the cultural history of yoga being the pastime of educated, and higher-caste, male populations (Sarbacker, 2021). Mallinson and Singleton (2017) were able to find several references to female practitioners within the ancient yogic texts suggesting women did have some access to the practice, though the extent to which they practiced is unknown, and the texts are written from a male practitioner's perspective. The opposite demographic to the present day female-dominated Western yoga culture. Singleton (2010) notes the influence of women's gymnastics and the gendered sport and fitness culture as yoga was adopted in Europe.

⁸⁰ Gender data for the full cohort of studies was not provided, given the range of participant groups within the meta-analysis (Phillips & Hine, 2021). In terms of mean age, 65.1% of participants were aged from 20 to ≥40-years, with 27.9% aged from 12 to <20-years (Phillips & Hine, 2021).

both healthy and clinical, and including military personnel (Phillips & Hine, 2021). This broad pool of data highlighted the significant effect of longer-term self-compassion interventions (Phillips & Hine, 2021); perhaps indicative of the need for sustained practice to move towards automaticity of a new approach (Rhodes & Sui, 2021). Nutrition and exercise behaviour (combined) had a significant positive relationship with self-compassion ($n=104$; $p<.001$), as did the majority of health behaviours under study⁸¹ (Phillips & Hine, 2021). As the authors note, the impact of self-compassion can be a tool in recovery from eating disorders; a point discussed prior in the Introduction⁸². An interesting feature of the metadata was that trait self-compassion — as assessed by self-report trait measures — predicted both health behaviour and physical health, although a reported limitation was the potential that this relationship could be in the opposite direction, i.e. good health and pro-health behaviours could facilitate self-compassion (Phillips & Hine, 2021). Whilst causation could not be verified, given that self-compassion is a positive gesture to oneself, it seems fitting that this attitude would promote a positive move towards health. It does also match the relationship that Sala et al. (2020) found between trait mindfulness and pro-health behaviour.

2.4.2.3 Ethics and yoga philosophy

An ethical survey tool developed by Büssing et al. (2021) — the Yama/Niyama Questionnaire based on principles denoted by Patanjali — was validated for Western yoga practitioners via a German survey ($n=901$; 89% female; mean age 49-years). Survey respondents had been practicing yoga for 13 ± 9 -years, with over half (55%) practicing ‘several’ times per week, and almost a third (31%) at a frequency of at least once per day, with 72% reporting a somewhat/very strict adherence to a vegetarian lifestyle (Büssing et al., 2021). Any other dietary preferences, such as vegan, were not surveyed. The sample had a lower alcohol intake than that reported within the yoga practitioner surveys included in this review, with 61% either never drinking alcohol or only imbibing once a month, possibly impacted by an over-representation from one specific yoga school (88% of the sample), though as the authors note, the yogic principles may be inherent characteristics of those attracted to yoga (Büssing et al., 2021). Yoga was considered either a ‘conscious way of living’, a lifestyle, or a spiritual path (for 91%, 82%, and 78% respectively) versus

⁸¹ Aside from ‘bodily routines’ (e.g. dental/body hygiene) and substance abuse (a potentially confusing term that collated alcohol and smoking use, alongside drug use) (Phillips & Hine, 2021).

⁸² Discussed in the Introduction chapter, section 1.6.4 on interoception and embodiment.

'gymnastics' for just a quarter (26%) of the sample (Büssing et al., 2021). The authors designed a total of 23 items to gauge a respondent's perception of their ability to follow the yogic principles, categorised into four 'factors' that collated different attitudes and/or ethical principles. For example, one factor was simply non-harming, i.e. related to the concept of *ahimsā* that is particularly relevant to diet⁸³; whilst another factor incorporated the concepts of devotion/surrender, self-reflection, contentment, and purity/clearness (or clarity), suggestive of a spiritual philosophy. Similar to a finding from Mace and McCulloch's (2022) study of yoga teachers, who noted that the adoption of a vegan or plant-based diet in alignment with yogic philosophy was equated (by one interviewee) to be an expression of a "spiritual journey" (p. 16).

One paper designed to specifically gain insight on the perception of wellbeing withing a yoga population, focused their attention on Ashtanga⁸⁴ yoga practitioners in order to reduce the heterogeneity of the practice, given that Ashtanga tends to follow a strict sequential 'formula' of *āsanas* practiced (ideally) six days per week (Ramirez-Duran et al., 2022a). Survey respondents (n=166; 80.1% female; 80.7% aged 25 to 54-years⁸⁵; 59.% practice frequency 5 to 6-days/week) were a subset of a larger online global study (n=352; 42 countries) (Ramirez-Duran et al., 2022a). A potential limitation of the survey was the fact it was based on closed-ended questions regarding practice and philosophy, thereby reducing the chance of respondents providing a more nuanced perspective and increasing the possibility of themes being guided by the questions. Of note, the yoga sub-group experienced wellbeing in an embodied way, and almost two-thirds (64.6%) felt yoga philosophy was relevant to their lives (Ramirez-Duran et al., 2022a). This underlying philosophy perhaps provided a context within which to perceive wellbeing as a transient state or a process, and a sense that wellbeing was linked to an ability to feel into and respond to life from an awareness of one's internal environment.

2.4.2.4 Practice components

Practice components such as frequency, duration, tenure, and location (home versus studio) are variables that feature within the research design, so how these components

⁸³ To be discussed in depth in Section 2.4.3.3.

⁸⁴ The lead author is a committed Ashtanga yoga practitioner with a teaching certification. As such, the authors acknowledged this influence, but also the potential of improved analysis due to depth of understanding of yoga concepts (Ramirez-Duran et al., 2022a).

⁸⁵ Demographics provided in a supplementary document (Ramirez-Duran et al., 2022b).

are discussed in the literature is a point of interest. In a multi-centre study (India/Ireland/Holland) of Ashtanga practitioners (n= 100; 68% female; mean age 37-years), practice components were positively correlated with tenure related to both practice frequency and the percentage of home practice (McKinney, 2020). As noted by McKinney (2020), Ashtanga is a yoga style that recommends a six day a week practice, so it is unsurprising that the average weekly practice frequency was five days. Equally, the repetitive sequencing and encouragement to practice at one's own pace is conducive to home practice — half of the Ashtanga practitioners reported practicing 50-100% at home — and explains the author's focus on locus of control (McKinney, 2020).

An online survey (n=2,620; 84% female; aged 15 to ≥61-years⁸⁶) advertised on international yoga platforms — Yoga International⁸⁷ & Yoganatomy.com⁸⁸ — and distributed to members of Yoga Alliance⁸⁹ (in the USA), collated self-reported positive and negative experiences of 'modern hatha' yoga practitioners, including information on yoga practice components (Wiese et al., 2019). Just over half (58%) of respondents reported practicing multiple styles, with Ashtanga by far the most common (at 32%) (Wiese et al., 2019). All other yoga styles were reported by no more than 3% (Wiese et al., 2019). Thus the study's assertion that a weekly practice frequency of five days minimum is a positive predictor of health benefits is informed by the Ashtanga contingent, with (as noted above) their unique focus on practicing (preferably) six out of every seven days (Wiese et al., 2019). However, it is yet another example in the literature supportive of a positive correlation between yoga practice frequency and health. With respect to tenure, 81% of participants had a tenure of at least 4-years, with over a third (41%) labelling their practice as consistent — versus “off and on” (p. 220) — and this consistency predicts positive outcomes that included physical, mental and emotional benefits, e.g. healing, stress management, and responding to life with equanimity (Wiese et al., 2019). Practice tenure itself is not necessarily an indicator of the level of outcome experienced. Wiese et al. (2019) noted that a tenure up to 3-years resulted in benefits similar to a tenure of more than 10-years, with one exception. Equanimity was only reported with a >10-year tenure (Wiese et al., 2019).

⁸⁶ The age range of 31 to 60-years equated to 79% of participants (Wiese et al., 2019).

⁸⁷ <https://yogainternational.com/>

⁸⁸ <https://www.yoganatomy.com/>

⁸⁹ <https://www.yogaalliance.org/>

2.4.3 Adherence to yoga and pro-health habits

An overview of adherence and habit strength was provided in the Introduction chapter. This section now focuses on the application of this topic to yoga, considering access to yoga; practice components (such as frequency) that may support adherence and/or motivation to practice; and the relationship between a yoga practice and additional pro-health habits, specifically physical activity and diet.

2.4.3.1 Practice consistency and benefits of a home practice

Linking back to habit strength, the impact of consistency is at play when it comes to sustaining a movement practice, regardless of modality. Consistency is a crucial factor in transforming behaviour into a habitual practice. In fact, having a consistent practice routine — assessed as participants' consistency of exercising at a specific time of day — was the most reliable habit predictor in a Canadian study of gym/fitness centre members ($n=181$; 64% female; mean age 43.4-years) with a movement practice of ≥ 1 -year (Kaushal et al., 2017). In Kaushal et al.'s (2017) study, baseline measures including participants' perceived behavioural control⁹⁰, could predict 'habit preparation' at the 6-week follow-up. The authors defined the habit preparation phase as "behaviours ... [that] transition an individual to an exercise-ready state" (Kaushal et al., 2017, p. 432), and their findings highlighted how influential preparation is to the resultant behaviour. Both preparatory habit and exercise habit correlated with a consistent routine (Kaushal et al., 2017). It is worth bearing in mind that the participants had a relatively low movement practice tenure, which may positively bias the influence of routine (in the early phase of habit development). As noted in the Introduction chapter, repeated behaviours can optimise self-regulation (Beedie & Lane, 2012). Specific to yoga, Cramer et al. (2019) found that practice frequency — an indicator of commitment — was positively associated with health status⁹¹ and pro-health behaviour (such as a lower alcohol intake, an increase in plant-based nutrition, and additional weekly exercise beyond the yoga mat).

A home yoga practice is less time-restrictive and accessible than travelling to, and paying for, a studio-based class. In an online survey of German yoga practitioners ($n=$

⁹⁰ Perceived behavioural control was surveyed via questions related to autonomy and self-efficacy (Kaushal et al., 2017).

⁹¹ Health status evaluated via outcome measures for health-related quality of life, sleep quality, fatigue, and mindfulness (Cramer et al., 2019).

1,702; 88.9% female; mean age 47.2- years; 58.2% yoga teachers), a home practice was identified as the essential independent predictor of health, with yoga teachers more likely to self-report a higher health status than yoga practitioners, though the authors acknowledge the limitations of self-report wherein teachers may respond in a way that fits with a healthy role model, i.e. social desirability (Cramer et al., 2019). But these findings are matched by two further studies that almost span the past decade. An earlier USA-based study by Ross et al. (2012) surveyed Iyengar⁹² practitioners (n= 1045; 84% female; mean age 51.7-years) with regards to health outcomes including diet (fruit and vegetable intake) and physical activity. Home practice frequency was the strongest predictor of health, over and above practice tenure (Ross et al., 2012). Similarly, one of the recent 'niche' studies, that surveyed yoga practitioners and teachers throughout the UK (n=2,434; 87.3% female; mean age 48.7-years) found practice frequency to be the variable associated with respondents' perception of the positive impact of yoga on their health⁹³ irrespective of tenure, and thus the aforementioned link between consistency of practice and health (Cartwright et al., 2020). In fact almost 70% of respondents linked their practice to lifestyle (Cartwright et al., 2020). The author's findings specific to physical activity and diet will be discussed in the respective sections to follow.

A home practice does lack one aspect that features in the literature, and that is the sense of connection or social support that can be felt by attending a movement class. A lack of discipline can be a barrier to a home practice, as can access to an appropriate space in the home (Cagas et al., 2020). Equally, commitments and lack of time can negatively impact a home-based movement practice (Cagas et al., 2020). Yet, having a self-driven home practice does link to self-efficacy with regard to the uptake of additional exercise (see the following section), and removes both financial and time barriers to practice. A longitudinal study (n= 1,830; 56.4% female; age 31.1-years) that collated weight-related health data on young people in the USA as they moved into adulthood at 5-year intervals, found that (regardless of weight status) almost 60% of the regular yoga practitioners⁹⁴ (n=294; 77.0% female; age for subset not available) had a home practice,

⁹² Iyengar being a breath-based movement style, akin to modern vinyasa, derived from the Krishnamacharya yoga lineage (Iyengar, 1979; Iyengar Yoga New Zealand, 2010).

⁹³ Respondents rated seven domains of health on a 5-point Likert scale — physical, mental, stress, strength, flexibility, sleep, lifestyle — according to “the extent to which they perceived yoga impacted” each domain (Cartwright et al., 2020, p. 3).

⁹⁴ As noted prior, a regular yoga practitioner was identified as having a minimum of 30-minutes of yoga per week in the preceding 12-months (Neumark-Sztainer et al., 2017). A practice frequency of at least 2-hours per week was reported by 23.8% of the practitioner subset (Neumark-Sztainer et al., 2017).

and this was their preferred location versus at a yoga studio, or gym/fitness centre (Neumark-Sztainer et al., 2017). Over three times as many females (20.5% of total sample) practiced regularly versus males (6.1%) (Neumark-Sztainer et al., 2017). Vinyasa flow — a popular Western yoga style with a focus on continuous breath-focused movement — was reported by just over half (56.1%) of practitioners, whilst approximately a quarter chose Hatha, hot yoga, or restorative/yin styles⁹⁵ as their usual practice (Neumark-Sztainer et al., 2017). A further 17% had a different or ‘other’ style, such as prenatal (Neumark-Sztainer et al., 2017); indicative of the wide range of yoga accessible in the West. Feeling confident in one’s ability (or self-efficacy) to move does appear to facilitate ongoing movement. A positive loop, whereby experience of yoga supports ongoing practice (Cagas et al., 2020).

2.4.3.2 Pro-health behaviour: Exercise / physical activity

The most recent yoga industry statistics⁹⁶ from the USA in 2015 (n=1,707 yoga practitioners, 72% female; n=2,021 non-yoga, 51% female; age >18-years) suggested a link between yoga and physical activity uptake, with over 75% of practitioners more active (in modalities other than yoga) than those who did not practice yoga (Yoga Alliance & Yoga Journal, 2016). Interestingly, the starkest contrast between yoga versus non-yoga practitioners was other ‘group exercise’ (not including Pilates which was identified separately). A larger percentage of yoga practitioners (37%) were regular group exercisers, with only 4% of the non-yoga respondents partaking (Yoga Alliance & Yoga Journal, 2016). Similar findings emerged from a later American study by Watts et al. (2018) that interviewed young adults (n=46, 73.9% female, mean age 30.6 years) who self-identified as yoga practitioners. As noted earlier, the inclusion criteria of a minimum of 30-minutes of yoga per week in the year prior is a minimal practice frequency and duration. Despite this, 70% of the participants reported an increase in physical activity levels in addition to yoga (Watts et al., 2018). Tenure or frequency of practice may be less indicative of a practice commitment than self-identifying as a yoga practitioner. A finding that stood out in Watts et al.’s (2018) study, was the fact that each hour of yoga practiced

⁹⁵ Hatha offering more static or held postures (versus a dynamic Vinyasa style; hot yoga indicating a practice in a heated room; and restorative/yin focusing on passive stretches either supported by props (restorative), or longer held postures with the assistance of gravity (yin). Yoga *āsanas*/postures may be classified according to a dynamic versus static approach (Bhavanani & Ramanathan, 2018).

⁹⁶ Yoga Alliance (personal communication, November 3, 2020) did advise that a large scale study was planned for 2021, but no response was received to enquiries made in October 2021 and July 2022..

weekly equated to (almost) a further hour of movement 'off the mat', or, to be exact, an extra 0.9-hours of moderate to vigorous activity, e.g. fast walking to jogging, or easy to fast biking.

A substantial online survey of Australian women based on a national health survey dataset (n=28,695; three cohorts randomly selected: aged 19 to 25-years, 31 to 36-years, and 62 to 67-years) reported a higher incidence of moderate physical activity (denoted as 150-minutes minimum) in the week prior than their counterparts who did not practice yoga or meditation practice, irrespective of practice frequency and age (Cramer et al., 2017). To note, yoga was not separated from meditation, and tenure of practice did not feature. Rather, a simple practice frequency was collated to determine how often respondents had practiced yoga or meditation in the past 12-months, with data categorised as never/rarely, sometimes, or often (Cramer et al., 2017). The majority practiced 'sometimes', which does not necessarily equate to an habitual movement practice. This differs greatly from the UK survey of yoga practitioners by Cartwright et al. (2020) — introduced in relation to spirituality — who on average practiced 5.5 hours over 3.9 days of the week (split evenly between home and studio settings). This difference is primarily due to specific recruitment through UK yoga circles (organisations, events, studios, etc.) versus a generic health survey, that one could argue provides quantity over quality, if one is seeking to source data for yoga participation. The UK respondents, sourced directly from within the yoga community, felt that their practice supported their lifestyle; and the vast majority (93.5%) self-reported brisk exercise at least once in the past week (Cartwright et al., 2020). Whilst the middle-aged women in Cox et al.'s (2021) small-scale study (n=22, mean age 56.5-years) shared experiences of yoga influencing uptake of other movement modalities, including walking and tai chi. For the study, participants self-selected whether they were experienced in yoga or a beginner/novice, with no guidance as to what these identifiers meant (Cox et al., 2021). What is interesting is that 20% of those participants who classified themselves as a beginner/novice, had more than 20-years practice tenure (Cox et al., 2021); perhaps indicative of a 'beginner's mind' attitude, a concept from Zen Buddhism (Rand, 2003)⁹⁷. Half of the novices had <1-year tenure, versus over half (58%) of the experienced practitioners reporting >20-years tenure (Cox et al., 2021). The authors checked for any contradictions in interview responses in relation to yoga

⁹⁷ A teaching that, from the researcher's own experience, can be used in yoga classes to guide a practitioner to let go of the outcome of a practice and/or to drop into the experience of the practice anew.

experience, but do not specifically relate tenure to yoga's influence. The only indication that tenure, or more specifically yoga 'experience', may have had an influence is that the thematic examples for 'self-care' behaviours linked to yoga were primarily from those practitioners that identified as experienced (five of the six quoted participants).

Finally, in a German online survey comparing modalities (yoga versus dance and team/individual sports) to wellbeing and body image in 'regular exercise practitioners'⁹⁸ (n= 270 healthy adults; 75% female; age 18 to 76-years), the yoga practitioners had the highest mean duration of movement⁹⁹ per day at almost 3-hours (2.98) versus 2.55, 2.43, 2.19, and 1.77-hours for individual sports, team sports, ballroom dance, and non-exercisers respectively (Marschin & Herbert, 2021). The authors questioned whether yoga led to an increased awareness of health promotion¹⁰⁰ or whether yoga attracted an already active population, though given that all survey respondents who identified as movement practitioners had a daily practice of more than 2-hours, one could argue that they were all active, regardless of modality. Equally, data was not collated regarding the extent of their activity prior to starting their primary movement practice, so a suggestion that the yoga practitioners were more active than their counterparts appears to be speculative.

2.4.3.3 Pro-health behaviour: Dietary preference

This section is prefaced by the statement that the scope of this research does not include the determination of which diet is best for health. Rather, the language used by the literature with respect to dietary preference and practitioners' own ideas of, and intentions pertaining to, healthy eating and/or their health is considered. It has already been noted in this chapter that a dietary preference may be aligned to philosophical ideals, rather than nutritional principles. The choice to eat a higher proportion of plant-based foods is now perceived as a pro-health choice, not only for humans, but also for the planet

⁹⁸ The inclusion criterion was a minimum of once per week, but went on to collate participants' 'main exercise' and all types of exercise; the criterion for the 'main exercise' denoted as exercise performed "most of the time, on most days of the week, and with the longest duration per session" versus other exercise (Marschin & Herbert, 2021).

⁹⁹ Movement included all physical activity reported by survey respondents alongside their primary modality (Marschin & Herbert, 2021).

¹⁰⁰ An awareness of health promotion is most likely referring to a knowledge of health promoting lifestyle factors, but the authors did not clarify why other movement modalities would not also increase this awareness.

(WHO/Europe, 2021). This combination of planetary and human health offers a broader ethical and/or philosophical framework on which to base dietary choices.

The literature does explore how a yoga practice may affect diet, for example via a change in perspective. A qualitative study of yoga practitioners from the USA (n=20; 75% female; age 35-67-years) discussed the concept of yoga offering a 'different experience' to weight loss via an habitual shift towards healthy eating (Ross et al., 2016). More specifically, participants believed that reduced stress as a result of their yoga practice resulted in "a better frame of mind to make healthier food choices" (Ross et al., 2016, p. 5), which is suggestive of a self-regulated emotional state. In addition, practitioners' commented that yoga strengthened their resilience to adhere to a healthful diet and thus sustain weight loss (Ross et al., 2016), again supporting the concept of self-regulation. Yoga tenure of participants was varied, with a mean of 15.3-years (SD 13.6) (Ross et al., 2016). The authors noted two intertwining themes within participants' narratives. Firstly, a shifting mindset towards health; and secondly, psychological changes, such as increased discipline, self-acceptance, and body awareness (Ross et al., 2016). The narratives thus reflect a holistic (mind/body) effect, an oft-quoted sequelae of yoga that may support behaviour change (Kirkpatrick, 2017).

An earlier large scale longitudinal study of adults from the USA (n=15,550; 51.4% females; aged 53 to 57 years; 10 years retrospective data¹⁰¹) surmised that participants who self-selected as yoga practitioners (n = 1,039) were less likely to gain weight (Kristal et al., 2002). Yoga practitioners were categorised according to practice tenure, duration, and frequency (up to 1-year, <30-minutes at least 1/week; 1 to 3-years, ≥30-minutes at least 1/week; and 4+ years, ≥30-minutes at least 1/week) (Kristal et al., 2002). Limitations of the study preclude the ability to determine the reason for weight maintenance, e.g. whether they were more generally active (Kristal et al., 2002). Less weight gain could be indicative of improved health habits in those with a history of yoga. Similar findings emerged from interviews with a subset of yoga practitioners (n=46, 73.9% female, mean age 30.6 years) selected from the 2018 study of young American adults and their weight-related health behaviours noted in the previous section (Watts et al., 2018). When asked about the impact of yoga on behaviour, 90% felt yoga had a positive effect on their eating behaviour (Watts et al., 2018). Participant themes included being motivated to eat healthier food to prolong the positive effect of yoga; an increased mindfulness or

¹⁰¹ Data was collated from a 'Vitamins And Lifestyle' study that excluded anyone reporting poor health, or with any history of disease that may influence weight loss (Kristal et al., 2002).

awareness around food and their body's needs; and increased energy for other exercise, as noted prior (Watts et al., 2018). The motivation to eat healthier (and move more) is suggestive of a switch to inherent motivation, i.e. the desire to expand on gains achieved through yoga, in comparison to an external motivator such as peer pressure or body image¹⁰². Indeed, positive body image can be facilitated through yoga, as noted in one of the 'niche' articles where middle-aged (n=22 total; mean age 56.5-years) novice and experienced female practitioners shared their experience of a changing relationship to their body through a yoga practice (Cox et al., 2021). Yet again, yoga seems to create a positive feedback (or self-regulating) loop. Cox et al.'s (2021) study provided a similar theme of yoga regulating food intake, both through the practice itself (via a decreased desire to eat a big meal) and through an increased awareness of, or attunement to, the body.

Likewise, adherence to exercise has been shown to offer a self-regulating effect on 'emotional eating' in obese¹⁰³ female participants (n=120; age ≥ 21 -years), with weight loss over a 2-year period attributed to psychological changes, such as improved mood rather than energy expenditure (Annesi, 2018). Exercise was self-reported by participants via questionnaire for the week prior (number of ≥ 15 -minutes of aerobic exercise). The 2-year protocol (providing exercise and nutrition group education/support in a community setting) provided evidence to support a consistent mediating effect of exercise, with a significant bivariate relationship between exercise behaviour and weight from baseline to 6-months onwards (Annesi, 2018). The role of regular exercise in facilitating a pro-health diet was evidenced four years prior by a German study. Fleig et al. (2014) completed a longitudinal questionnaire-based study of a clinical population (59% females; mean age 50.46-years) 18-months after completion of a cardiac (n=124) or orthopaedic (n=379) rehabilitation programme. As for Annesi's (2018) study, a habit of regular self-directed exercise (post-rehabilitation) was a predictor of adherence to healthy eating (Fleig et al., 2014).

¹⁰² Body image is a topic of research that lies outside the remits of this thesis. Images that represent yoga practitioners often fit a specific slim and toned physique in advanced postures (Hinz et al., 2021). A recent survey (n=297; 79.7% female; mean age 30.8-years) of young adults' motivations to practice found improved health outcomes in respondents who were interested in the mindfulness effects of yoga, rather than practicing to improve their physical appearance (Kramer-Kostecka et al., 2022).

¹⁰³ Obesity was classified as a body mass index of ≥ 30 and < 40 kg/m², or class 1 and 2, with participant eligibility including not partaking in any other weight-loss program, including self-directed (Annesi, 2018).

Of note, from the literature collated to inform the research design, a 2014 comparative study of long term movement practitioners (yoga versus running) intended to specifically “explore the potential long-term benefits of consistently practicing selected health behaviours over time” (Satin et al., 2014, p. 240). For their study, Satin et al. (2014) defined long-term as a minimum of 2-years practice, at a frequency of at least 30-minutes, once per week; another example of a minimal yoga ‘dose’; though on this occasion with a tenure $\geq$ 2-years, versus a criteria of 12-months for Watts et al. (2018). Yoga practitioners (n=47; 57% female; mean age 39.5-years) with a practice frequency of three times per week, and a minimum duration of 30-minutes per session (yoga being their only exercise modality¹⁰⁴), were compared with runners (n=46; 57% female; mean age 33.6-years) who had the same frequency/duration of practice, and a sedentary control (n=52; 54% female; mean age 34.6-years) (Satin et al., 2014). Satin et al.’s (2014) study informed RQ2¹⁰⁵, as a difference in dietary choice was evident, with more yoga practitioners self-identifying as vegetarian or pescetarian; though whether this preference preceded uptake of a yoga practice was not clarified.

A correlation between yoga and vegetarianism/veganism has been demonstrated in several studies across countries led by Cramer and co-authors, who feature prominently within the integrative medicine field (which includes yoga and meditation studies). Examples include the 2017 cross-sectional national survey of Australian women¹⁰⁶ (n=28,695) discussed in the previous section, whereby the youngest cohort who practiced yoga or meditation (aged 19 to 25 years) showed the highest prevalence of a vegetarian (8.7%) or vegan (1.6%) diet, versus 2% and 0.1% respectively for the oldest yoga/meditation cohort (62 to 67-years) (Cramer et al., 2017); and, again mentioned prior, a 2019 survey of German yoga practitioners (n=1,702; 88.9% female; mean age 47.2-years) — over half (58.2%) being yoga teachers — with a prevalence rate of a vegetarian/vegan diet six times higher than the wider population (Cramer et al., 2019). A further study based on a large USA dataset (n=34,525; gender data not provided; aged 18

¹⁰⁴ Again, the nuances of a yoga practice are apparent: yoga for Satin et al. (2014) was defined as including both postural and meditative components, yet the meditation could be on or off the mat. Additionally ‘hot yoga’ styles, i.e. undertaken in a heated environment, were excluded to prevent any confounding impacts of temperature, presumably because the study included outcome measures specific to cardiovascular health, such as blood pressure (Satin et al., 2014).

¹⁰⁵ **RQ2:** Is there a relationship between adherence to a yoga practice and pro-health habits?

¹⁰⁶ As the sample was taken from a health survey dataset, yoga teacher status did not feature as a variable (Cramer et al., 2017).

to >65-years; yoga teacher data unclear¹⁰⁷) of yoga practitioners collated in a national population health survey — the 2012 National Health Interview Survey — again confirmed a higher rate of vegetarianism (in the preceding 12-months) in respondents who identified as yoga practitioners versus their non-yoga counterparts; 8.3% versus 1.3% respectively (Cramer et al., 2018). Of note, the prevalence rate for the yoga subset is remarkably similar to that of the younger cohort of the Australian study (Cramer et al., 2017), despite it being an earlier (2012) dataset. Perhaps, given the expansion of the plant-based movement in recent years — particularly in Europe where it has been aligned to climate change policy (Plant Based Treaty, 2022) — it is not unexpected that Cartwright et al. (2020) found a much higher prevalence in their UK survey respondents (n=2,434; 87.3% female; mean age 48.7-years), 40% of whom were yoga teachers. Almost a quarter of practitioners identified as vegetarian (18.7%) or vegan (3.9%) (Cartwright et al., 2020). Again, the proportion of each — approximately 5 times more vegetarians than vegans — was similar to the younger cohort (age 19 to 25-years) in Cramer et al.'s (2017) survey.

There is cross-study support for a higher prevalence of a non-meat diet in yoga teachers. For example, 24.5% of yoga teachers were vegetarian, versus 14.8% of non-teachers (Cartwright et al., 2020). A recent UK study of yoga teachers also matched the data of Cramer et al. (2019), reporting a prevalence six times that of population norms for a vegetarian diet, while the prevalence rate of a vegan/plant-based diet in their yoga teacher sample (n=449; 87.5% female¹⁰⁸) was 25 times higher than the UK norms (Mace & McCulloch, 2020). Unsurprisingly, teachers who participated in a survey focused on the consumption of meat as it relates to *ahimsā* in yoga philosophy are likely to be interested in this topic, potentially creating a pre-selection bias in respondents' dietary preferences. Equally, yogic philosophy may be a factor more prominent for yoga teachers (versus practitioners) when making lifestyle choices, which, as Cartwright et al. (2020) noted, may present as a greater tendency towards a plant-based diet than the general population.

The tendency for yoga philosophy to translate to lifestyle 'off the mat' does offer a plausible explanation for reasons underlying pro-health behaviours in yoga practitioners,

¹⁰⁷ A formal yoga training variable was included in the survey as "Took a class/received formal training" (p. 50) without any confirmation of whether a respondent was in fact a yoga teacher (Cramer et al., 2018).

¹⁰⁸ Neither an age range, nor median age was reported (Mace & McCulloch, 2020). Only the two largest age cohorts were identified: 35% of the yoga teacher were aged 35 to 44-years (n=156) and 31% aged 45-54-years (n=141), i.e. representing only two thirds of the sample (Mace & McCulloch, 2020).

given the benefits of primarily plant-based and 'healthy'¹⁰⁹ food choices (Hemler & Hu, 2019; Szabo et al., 2021). But this translation did not come to fruition in Mace and McCulloch's (2020) survey. Although almost 70% of their UK yoga teacher sample were in agreement¹¹⁰ with the statement: "A plant-based diet is most aligned with my yoga practice"(p. 10), only 20.2% were vegan, and a further 19.3% vegetarian. So whilst the high level of agreement does suggest an underlying culture, other factors were at play with respect to the incongruence between philosophical ideals and their application. The reasons became clear in a later published article by Mace and McCulloch (2022) focused on the yoga teacher interview data (from the same study). Nine interviews¹¹¹ (aged 35 to 54-years; 88.9% female) were completed to the point of theme redundancy (Mace & McCulloch, 2022). Whilst a plant-based diet was deemed consistent with *ahimsā*, a variety of diets were prevalent within the interview sample, including vegan, vegetarian, pescatarian (eats fish/seafood, dairy, and eggs), reducetarian (reducing meat, fish, and dairy intake), conscientious omnivore (purchasing based on animal welfare and local produce), and a 'standard UK diet', defined by the authors as consumption of animal product "without conscious effort to reduce consumption ... or to procure ... from higher-welfare sources" (Mace & McCulloch, 2022, p. 8). The interviewed teachers described their 'dietary journeys' as an evolving awareness of animal welfare, but motherhood and family preferences had influenced their diet (either towards meat or in the opposite direction) (Mace & McCulloch, 2022). Furthermore, concerns regarding adequate nutrition were a barrier to veganism, though the two vegans trusted their diet could sustain them healthfully (Mace & McCulloch, 2022). The authors concluded that the teachers had 'negotiated' different applications of *ahimsā* to best fit their circumstances, with a wider perspective beyond the ideal of veganism towards reducing harm through improved animal welfare. This negotiation enabled the teachers to incorporate meat in their diet if they felt it was beneficial to health (Mace & McCulloch, 2022).

The large-scale USA study (n=34,525) by Cramer et al. (2018) that was noted earlier¹¹², explored the specifics of diet and practitioners' relationship to their practice. Respondents who identified as a vegetarian yoga practitioner were more than twice as

¹⁰⁹ Hemler and Hu (2019) delineate between healthier plant-based diets, with a focus on whole foods, fruit, vegetables, nuts, etc., versus a diet of refined grains, fruit juice, and processed food products.

¹¹⁰ 27.9% somewhat agreed and 40.7% completely agreed (Mace & McCulloch, 2020).

¹¹¹ The interviews were not face-to-face: eight were virtual (audio only), and one undertaken via email (Mace & McCulloch, 2022).

¹¹² Data was collated from the 2012 National Health Interview survey (Cramer et al., 2018).

likely to eat organic food than the non-vegetarian (omnivorous) yoga practitioners (at a rate of 46.8% to 22.2%) (Cramer et al., 2018). One possible explanation for eating organic food may be that it is a philosophical choice, i.e. less harming to the environment. Alternatively it may simply be considered healthier to eat organic, given that participants were motivated towards a 'healthier diet'. In addition, almost two thirds of the vegetarian practitioners (57.7%) rated yoga as very important for the maintenance of health and wellbeing, versus a third (35.2%) of the non-vegetarian contingent (Cramer et al., 2018); suggestive of a greater focus on yoga as a pro-health choice in those practitioners who prefer not to eat meat. A philosophical or ethical motivation to dietary preference was not examined, aside from the authors raising the question of a cultural affinity between yoga and vegetarianism (Cramer et al., 2018). One plausible explanation is that yoga predicts vegetarianism rather than the other way around, given that a non-meat diet is a feature in the religious traditions underlying yoga. As Gemar (2020) noted in his survey of a generic representation of the UK population¹¹³ (n=1,106; 51.9% female; age 18+ years), an alignment to Hinduism or Buddhism was associated with vegetarianism. Intriguingly, the key predictor of a yoga/meditation practice and/or being vegetarian (a category that included both vegetarians and vegans) was the degree of importance respondents placed on 'exercise' (Gemar, 2020); a term not defined by the author, yet it does provide a sense of the priority respondents placed on being physically active, irrespective of modality.

Referring back to ethics, an explicit link between the yoga teachings (*sūtras*) of Patañjali and vegetarianism is proposed by Dickstein (2017) who suggested that yoga practitioners "strive"¹¹⁴ (p. 623) towards vegetarianism — thereby upholding *ahimsā* — as a result of their commitment to practice. Whether *ahimsā* is also inclusive of non-harm to the environment is not yet evidenced in the literature, despite the increasing emphasis on the need for a greater global uptake of plant-based nutrition to help mitigate climate change, with the added advantage of reduced global health burden (Drew et al., 2020; Plant Based Treaty, 2022). What is evident is that yoga practitioners do not necessarily abide (or have interest in) yoga philosophy. As shown by Cramer et al.'s (2018) data, yoga practitioners in their USA-based study tended towards pro-health behaviours, whether or not meat formed part of their diet; with similar findings on motivation to select healthier

¹¹³ A population who have consented to partake in Survey Monkey surveys to a quota sample representative of the UK census data for age/gender (Gemar, 2020).

¹¹⁴ Strive is a direct quote, given that striving is not a common phrase that accompanies yoga philosophy, where the emphasis is usually on non-attachment to outcome, or *aparigraha* (non-grasping) (Roy & Charlton, 2019).

foods (59.2%/46.6%), and to increase exercise frequency (72.3%/65.9%) for vegetarians and omnivores respectively.

Conversely, to provide balance to the pro-health behaviour evidence, an intriguing finding by Cramer et al.'s (2017) Australian study was an increased use of marijuana and hallucinogenic drugs over the prior 12-months in two of the three yoga/meditation cohorts, with the exception being the oldest age category (62 to 67-years). For example, hallucinogenic prevalence was up to 4 times that of the non-yoga/meditation cohorts (Cramer et al., 2017). The authors speculated that drug usage may have been for the purposes of expansion in a spiritual context, or that yoga and drug use may appeal to similar personality traits, with a recommendation for further research to gain understanding in this regard. Again, on the 'unhealthier' side of the spectrum, another dietary behaviour that warrants consideration is the potential for an ethical viewpoint to shift towards obsessive eating practices, or orthorexic¹¹⁵ tendencies. Whilst the link between yogic philosophy and orthorexia had not yet been directly studied (at the time of collating the literature), obsessive eating¹¹⁶ within exercise and sporting contexts was considered by Strahler et al. (2021) in their review and meta-analysis of 25 studies globally that measured movement frequency (n=10,134; 56.4% female; mean age 25.2-years). Gender did not factor into the findings, i.e. gender differences were negligible, but a moderate correlation between orthorexic eating and exercise addiction was found, and only a slight correlation to exercise in general (Strahler et al., 2021). The authors did note that the findings were limited by the fact that addiction or exercise dependence only featured in 28% (7/25) of the reviewed studies and due to the wide-ranging populations across studies, from athletes and ballet dancers to gym members (Strahler et al., 2021). But it is worth keeping in mind the possibility that a strict adherence to a guiding philosophy, such as *ahimsā*, may augment the chances of an unhealthy obsession. Overall, the narrative is one of pro-health behaviour in yoga practitioners that transcends

¹¹⁵ Orthorexia nervosa is a condition introduced by Bratman and Knight (2000) to encapsulate "a fixation on eating healthy food" (p.9), whereby healthy eating dominates daily life. Orthorexics have more recently been defined as: "individuals with an obsession for proper nutrition who pursue this obsession through a restrictive diet, a focus on food preparation, and ritualized patterns of eating ... typically concerned by the quality ... of food" (Koven & Wabry, 2015, p. 386).

¹¹⁶ As denoted by responses to the ORTO-15 (Questionnaire for the diagnosis of orthorexia) (Donini et al., 2005); the DOS (Düsseldorf Orthorexie Scale) (Chard et al., 2019); or the EHQ (Eating Habits Questionnaire) (Gleaves et al., 2013). A total of 21 studies incorporated a version of the ORTO-15, i.e. some used fewer questionnaire items; 3 studies used the DOS; and just one study used the EHQ, which has had its validity and reliability questioned regarding the extent to which the EHQ may capture obsessive versus healthy eating tendencies (Mohamed Halim et al., 2020).

the yoga mat to encompass other movement modalities and food choices. Teachers, in particular, appear to have incorporated yogic philosophy in their dietary preferences.

2.4.4 Holistic movement and contemplative practices

Adapting or self-regulating in accordance with internal (interoceptive) and external (environmental) needs, or more simply, applying embodiment in an ‘off the mat’ context—and attuning this skill through practice — could explain positive health behaviour and the role of yoga/mind-body practices. The link between body and brain often referred to as ‘mind-body’ can apply to any physical activity undertaken with an “inwardly directed focus” (Archer-Eichenberger, 2004). Therefore, one would expect to find increased self-regulation with modalities offering similar intrinsic qualities to yoga, i.e. breath-centred or embodied movement with practitioners consciously focusing awareness on the breath and/or the felt sense of the body. The term ‘holistic movement practice’ has recently been proposed to encompass this subset of movement (Vergeer et al., 2021); a useful concept that embraces both the experience of, and attention to, the movement. Indeed, a definition posited by one journal requires holistic movement practice papers to incorporate “substantial physical activity” content sufficient for replication of findings (Taylor et al., 2021).

Most recently, Vergeer and Biddle (2021) developed a useful schema to categorise mediators and moderators of holistic movement practices into five areas: the physical components of a practice, such as intensity, duration, use of breathwork; mental engagement, specifically attention (to both internal and external environments) and concentration; the psychosocial context, i.e. the social connection and interaction with a teacher and/or peers versus a solitary home practice; the pedagogical (or philosophical) context; and the physical location, including all the sensory factors that could impact one’s practice, such as practicing alone at home versus in a group, and with or without music. As the authors note, alongside these five so-called “active components” (Vergeer & Biddle, 2021, p. 2), the practitioners themselves have their own subjective factors, e.g. health status and motivation, that can impact their experience and outcomes. These five categories of influence will provide a filter through which to observe the participant findings in the Discussion chapter.

What is worth noting is the historical lineage of concepts within yoga. Patanjali points towards an embodied self-awareness as a result of the eight limbed path outlined in the

Yoga *Sūtras* (Funes Maderey, 2018); a text both influenced by Buddhism and the philosophical Hindu discourse amongst Indian yogic schools of thought (Maas, 2013). Funes Maderey (2018) sheds light on the term “yogic perception” (p. 263) and its common use within classical Indian philosophy to denote an experience of self-awareness through meditation; going further to assert that an embodied self was represented in the *Upaniṣhads* — a collection of Vedic scriptures that span 600-100¹¹⁷ BCE (Elby, 2014) — as a ‘yoking’ of this yogic perception in order to notice one’s reaction to mental and physical fluctuations. *Sūtra* 1.20 is the first statement on yoga by Patanjali, after *sūtra* 1.10 announces that the teaching of yoga begins. *Sūtra* 1.20 can be translated as: “Yoga is the settling of the mind into silence” (Shearer, 1982, p. 90). This mental ‘settling’ describes the state of meditation — the end result of a yoga practice as denoted by Patanjali — and is a succinct overview suggestive of self-regulation of the mind(-body) as a consequence of being in a state of yogic perception or embodiment. A different perspective is offered by Bryant (2009), who interprets *sūtra* 1.20 as a description of a practice by which one may ‘settle the mind’ through discipline, study, and dedication to something greater than oneself. Whilst a later commentary rewrites the *sūtra* as: “Yoga is directing and containing the activities of the mind.” (Roy & Charlton, 2019, p. 14) These varied definitions demonstrate how the context within which the *sūtra* is considered, i.e. the temporal, social, and a reader’s individual interpretation, provide an infinite variety of ‘translations’. Yet despite this, the verse does uphold (what appears to be) its central tenet: that the mind is quietened, or down-regulated, through the practice of yoga (whether that be a moving or sitting practice).

There is growing support for ‘mindfulness-based movement’ across exercise modalities and including activities of daily living, i.e. outside of a specific modality or practice, with an emphasis on the cultivation of an intrinsic sense of being in the movement, irrespective of what form that movement may take (Lucas et al., 2018). A 2013 metareview of ‘meditative movement’ studies — primarily based on 14 review papers — for anxiety and depression suggested that modalities such as yoga, qigong, and tai chi, offer effects over and above ‘exercise’, though study quality was questioned (Payne & Crane-Godreau, 2013). The authors assert that the added elixir is a focus on breathing (*prāṇāyāma* in yoga) and attention, particularly in the form of ‘interoception’ (Payne & Crane-Godreau, 2013); a concept eloquently defined by Farb et al. (2013) as attending to

¹¹⁷ A slightly larger date range of 700 to 100 BCE is offered by Mallinson and Singleton (2017) for the early *Upaniṣhads*, who acknowledge the difficulty in dating ancient Indian texts.

the “sensation of the body itself” (p.13). The discourse vis-à-vis attention and embodiment (as the experience of interoception) across holistic movement practices suggests that the combination may be an influence on, or mediator of, self-regulation.

Contemplative practices, such as prayer or meditation, also offer self-regulatory benefits through embodiment, with potentially similar neurophysiological changes, though the addition of movement does provide an opportunity to enhance the capacity to perceive sensation. The attention side of the equation may be partly explained by an alternative discourse regarding the application of a narrow visual gaze to promote self-regulation in exercise and counter negative perceptions of the exertion required to exercise (Balcetis et al., 2020). The authors demonstrated an improvement in efficiency and frequency of walking when attention was directed towards a visual stimulus ahead, particularly in participants¹¹⁸ (across multiple studies) who were actively committed to a health goal (of losing weight). At first glance, this study seems unrelated to yoga, with Balcetis et al. (2020) recommending alternate strategies to narrowing visual focus in unchanging environments, such as on a yoga mat. Yet a fixed gaze during practice — such as between the feet in downward dog, or towards sensation, e.g. to the soles of the feet touching the mat — may facilitate both goal-direction and a practitioner’s perception of their practice. Though ‘goal direction’ in yoga may seem to be a misnomer, the ‘goal’ or intention could be simply being present to the experience. This narrow gaze of attention offers a possible explanation for adherence through a more easeful experience, i.e. an interpretation of Balcetis et al.’s (2020) findings through a holistic movement practice lens.

One Hungarian study compared yoga with two other movement modalities from an Eastern philosophical origin, aikido and judo, though notably the comparators were both martial art forms (Szabolcs et al., 2021). A control group was included in the design versus regular practitioners of the three disciplines (n=341 total; yoga participants n=75, 22.0%) (Szabolcs et al., 2021). An obvious difference was gender participation between the three practices, with yoga practitioners being predominantly female and slightly older (84% female; mean age 44.0-years), than aikido (18.2% female; mean age 37.3-years) and judo practitioners (21.7% female; mean age 33.2-years) (Szabolcs et al., 2021). Practice tenure was not recorded, but practitioners were only included if the practice was

¹¹⁸ Five studies (primarily USA-based and one global platform) were undertaken to consider a range of hypotheses and to consider any effect of the hypotheses on demand effects, with data captured from a New York study considering urban environments and health, and from an online survey conducted in New York City, Boston, Washington D.C., and San Francisco. Participants were adults (aged >18-years) (Balcetis et al., 2020).

their primary movement modality, and mean weekly practice dose was recorded at 4.5hours (aikido), 5.4-hours (yoga) and 8.0-hours (judo) respectively (Szabolcs et al., 2021). It is unclear whether the higher levels of spirituality and self-compassion noted for the yoga practitioners was due to the practice or to gender, though spirituality did show a positive relationship to the weekly yoga dose (Szabolcs et al., 2021). One notable feature of the study is that all modalities rated equal for mindfulness and body awareness (Szabolcs et al., 2021).

The adjacent field of contemplative practices (and contemplative psychology) offers a perspective that is worth documenting, given that meditation is a key element in an integrated yoga practice, and this study includes data on participants' meditative practice. Van Gordon et al. (2021) provide a comprehensive overview of the ideas that unite related fields, including yoga, Buddhism, and mindfulness, of which mindfulness in many forms has expanded into applications such as workplace wellness and mental resilience, particularly since the proliferation of working from home in the COVID-19 era¹¹⁹. Yet, adherence to a yoga practice does not necessarily include contemplation, unless a practitioner chooses to deliberately practice yoga with an attentive awareness directed towards personal wellbeing, to insight, or to a chosen object of contemplation (e.g. the movement of the breath, or a *māntra*¹²⁰) (Van Gordon et al., 2021). One would expect that adherence to a yoga practice over time would increase the potential for practitioners to incorporate contemplation. A specific aspect of contemplation highlighted by Van Gordon et al. (2021) — focused observation — is a good fit for the interoceptive or felt sense of yoga, or as the authors succinctly put it: “experiencing experience” (p. 6). As such, focused observation will be considered in the context of themes raised by study participants.

Research within clinical settings is also beginning to capture an integrated or holistic practice by offering less prescriptive yoga interventions, for example specifying the frequency and duration of the yoga class, and the need to incorporate *āsana*, *prāṇāyāma*, and meditative components of practice (Hiles et al., 2021). The sequencing of each yoga class within the research intervention may be left to the yoga teacher (or yoga therapist/physiotherapist), with the opportunity to adapt in accordance with the

¹¹⁹ The pandemic's impact on yoga, e.g. the proliferation of online yoga delivery, is considered in the Discussion chapter.

¹²⁰ *Māntra*, or ‘mind instrument’ has many definitions. One that fits with its common use in Western yoga teachings is “a word or the combination of words” which historically may be an access point to healing or to connect with a deity (Hiemstra, 2022).

requirements of the class attendees at any given time. For instance, how this evolved for Hiles et al.'s (2021) study of yoga in a severely asthmatic population was that over the course of their 16-week intervention (offered twice a week with guidance on a home practice), the duration of the meditative component of class increased from 10 to 30-minutes for the Friday afternoon class. This increase in duration was not specifically commented on in the findings, though participants reported that “stress-reducing relaxation skills” (p. 15) were one of the most helpful elements of class (Hiles et al., 2021). Perhaps the class participants shared their experience with the teacher, who responded by allocating more time to meditation. Indeed, in recent times, the fullness of yoga — inclusive of breathwork and meditation — is also appearing in yoga studies. For example, a recent narrative review does query the “synergistic effects” that may arise from combining a physical yoga practice (poses) with breathwork and meditation (Field, 2020, p. 66). Circling back to prescribed protocols, the Government of India has developed a Common Yoga Protocol (Ministry of Ayush Government of India; 2021) that it shares globally on International Yoga Day — on the Summer Solstice, June 21st — since the inaugural event in 2015. The suggested protocol features both breathwork and meditation to close the practice once the physical poses are complete, and since its inception has featured in yoga research (Sharma et al., 2021).

2.5 In Summary

By situating this doctoral study within the current conversation, the goal was to clearly identify any relationships between the source literature and the research questions. Due to yoga's ‘off the mat’ effects, recommendations to explore the relationship between yoga and lifestyle are a common theme in the literature. Not surprisingly, given the potential crippling financial burden of obesity and diabetes globally, research designed to explore sustained behaviour change with respect to diet and exercise is paramount (Watts et al., 2018). With the intention of adding to the conversation, this thesis explores the impact of experiential flow-on effects of yoga in an adult (18 to 65 years) population self-identifying as yoga practitioners (with yoga as their primary movement practice) throughout New Zealand. More specifically, this doctoral study considers two research questions¹²¹ which

¹²¹ **RQ1:** How has a movement practice (yoga) impacted practitioners’ lives ‘off the mat’? **RQ2:** Is there a relationship between adherence to a yoga practice and pro-health habits?

combine to explore whether adherence to a yoga (movement) practice is experienced as a downstream positive self-regulatory influence on health behaviour. The thesis thus explores the concept of a yoga practice as a self-regulatory tool to support health-promoting behaviours, specifically in the realm of diet and exercise.

A research narrative is emerging around the utility of yoga as a self-regulatory tool, and the objective of this study is to contribute to the existing narrative. There is a need for studies to consider HRV, interoception, and health behaviour (Sullivan et al., 2018). By impacting the PSNS — or, more specifically, the ventral vagal complex which calms and regulates our social engagement (Lucas et al., 2018) — yoga may positively change our relationship to both internal and external cues¹²² and thus our behaviours (Sullivan et al., 2018). Whilst yoga research is complicated by the study of practices that are both yoga and/or meditation, the inclusion of movement (rather than just seated meditation) is a fundamental component relevant to this thesis, backed by the introduction of ‘holistic movement practice’ to define a research subset that captures the experience of, and attention to, movement (Vergeer et al., 2021). Preferably holistic movement practices should be studied in isolation, rather than being combined together. For example, yoga and Pilates users have been combined in past research, particularly in national datasets looking at exercise participation (Sport New Zealand, 2020; Vergeer et al., 2017, 2018). Yet these two modalities have both a divergent history and practice focus.¹²³ The question of whether the modality of movement matters, or whether a quality of mindfulness, or simply an enjoyment of the practice (as noted in the Introduction chapter) is enough to engender adherence and pro-health behaviours is an open debate, and one that this study is focused on.

The methodological approach follows, with a research design aimed at capturing the full extent of participants’ individual movement practices — both within and external to the yoga studio context — in order to centre the findings on the participant experience. This ‘real world’ perspective both affirms the phenomenological framework underpinning the

¹²² The potential for yoga to change the relationship to external cues may offset any negative influence of the external environment on interoceptive abilities. Whilst positive social relationships are more likely to facilitate interoception (and vice versa), a challenging social situation may require an externally oriented focus thus limiting the attention available for interoception, labelled by Arnold et al. as an ‘attentional switching’ (2019). Given that study participants chose to practice either in a specific studio (that matched their needs) or in their own home, the environment was more likely to be a supportive milieu for an internally directed focus, and thus this subset of the literature was considered beyond the research scope.

¹²³ From the personal experience of the researcher who has taught both yoga and Pilates.

design, and the researcher's intention to observe within the field of practice rather than prescribing a practice (or yoga protocol) on participants.

CHAPTER 3: METHODOLOGY AND METHODS

3.1 Aims

The aim of this study was two-fold: to establish whether participants felt that an habitual yoga practice had pro-health downstream influences ‘off the mat’; and to explore the lived experience of yoga by practitioners, with an emphasis on experiential impacts beyond the mat. The overarching inquiry lies at the convergence of the study’s two research questions:

RQ1: How has a movement practice (yoga) impacted practitioners’ lives ‘off the mat’?

RQ2: Is there a relationship between adherence to a yoga practice and pro-health habits?

The research design was based on a ‘real-world’ setting, to study the movement practice of yoga as defined by the participants, rather than requiring participants to engage in a specific yoga intervention. By studying participants’ experiences of their practice and collating each participants’ definition of a yoga practice, the study aims to broaden the conversation within the yoga literature from an interventional — and often compartmentalised or purely postural — approach to an exploration of the lived experience of a yoga practice, whether that incorporates breathwork (*prāṇāyāma*) and/or meditation (*dhyana*) alongside yoga poses (*āsanas*). The experience of committed practitioners is viewed through the lens of adherence to yoga, with an exploration of the scope of influence of a personal practice on lifestyle choices.

3.2 Epistemology and Methodology

The epistemological lens through which the research topic is explored determines the methodology and methods fit for purpose. As Braun & Clarke (2022) noted, epistemology is often an unconscious knowledge base that can aid “design coherence” (p. 167) if explicitly acknowledged. For this study, the overarching epistemology or paradigm underlying the questions posed is a combination of critical realism and phenomenology. Critical realism is a view of reality through a cultural and linguistic filter, i.e. experiences

are coloured by context (culture), social and/or linguistic norms, and an individual's perception of the world and their place in it (Braun & Clarke, 2022). From the researcher's perspective, such filters include: an experience of yoga and the social practices within the NZ yoga community (both as a teacher and student); accessibility to studios, a home practice and yoga literature; being an educated, white, middle-aged woman; and having a personal interest in the research topic. The second theoretical underpinning is phenomenology, with a simple definition provided by van Manen (2014), who breaks down the word into its component parts: "... phenomenology is the study (logos) of phenomena ..." (p. 60). This broad definition highlights phenomenology as an epistemology aimed at accessing knowledge arising from "the quality and texture of experience" (Willig, 2013, p. 16). An experience is subjective to each individual and thus meaning is derived from multiple viewpoints. If we combine the two epistemologies in the context of this research: a critical realist perspective acknowledges the environment within which a yoga practice is experienced, yet phenomenology values the experience itself as a central defining knowledge base.

To separate phenomenology as a theory of experience from its application as a methodological approach, requires a return to the topic being studied. In order to explore the experienced flow-on or downstream impact or influence of yoga on practitioners' lives, the design priority was selecting a methodology and data collation methods that would enable the subjective experiential narrative to emerge, both at an individual level and across the dataset, such that it "brings out into the open that which is ... concealed" (Smith, 2007, p. 93-4). Accordingly, a qualitative methodology — interpretive¹²⁴ phenomenology — was the chosen approach, enabling subjective experience to be brought to the surface via "rigorous and extensive use of ... first-person insight" (Lutz & Thompson, 2003, p. 49). As Krell (1993) asserts, phenomenology is a method of interpreting a phenomenon, such as a lived experience of yoga, with hermeneutics being "the work of interpretation" (p. 84). The central focus is experiential data (a nod to the epistemology); seeking a "unified vision" or theme across different perspectives (Moustakas, 1994, p. 58). The narrative within the data provides access to the shape of experience (van Manen, 2014). Yet, as Willig (2013) clarifies, interpretive phenomenology is an approach that ventures beyond the experiential data to consider the wider social and cultural constructs, again supporting the choice of epistemologies.

¹²⁴ Also termed 'interpretative'.

A specific branch of phenomenology espoused by the German philosopher Martin Heidegger (1889-1976) has been selected due in part to Heidegger's view — outlined in one of his most well-known texts 'Being and Time' (published in 1927) — that through language (or narrative) we can access the essence of remembered 'being', or a memory of being in the moment (Heidegger, 1993). Given the fact that yoga provides an opportunity to reconnect with the present moment, to drop into a state of simply 'being' and experiencing the yoga practice as it unfolds, the Heideggerian approach was considered an appropriate fit for this study. From a historical perspective, Heidegger seems uniquely positioned for the study of an Eastern philosophy (yoga) from a Western perspective, given that he was pivotal in the acceptance of non-Western philosophical thought (Ellis, 2018).

Further support for this methodological choice is the acceptance of a researcher fully embedded in their research topic as a positive 'meaning-making' tool, rather than muddying the water (as outlined next). Indeed, bringing subjective experience to interpretation can offer a "dynamic interplay" (p. 6) from which new insights may emerge (Freeman, 2008); as long as the researcher reflects on their "own point of departure, ... presumptions and presuppositions." (Dahlberg & Dahlberg, 2019, p. 3-4) Moreover, Dahlberg and Dahlberg (2019) assert that understanding meaning, in relation to each participant's subjective experience and unique context, is the axis around which qualitative research pivots. The key point being that the researcher's goal is to best present the participants' meaning (or narrative), whilst simultaneously being aware of the constant presence of their own.

3.2.1 Heideggerian hermeneutic phenomenology: Researcher reflexivity

The need for transparency on the part of the researcher is central to the epistemological approach and is essential given the researcher self-identifies as a committed yoga practitioner. The relationship between the researcher (the seeker of knowledge) and the data itself should be laid bare so as to fully explore the data from all angles. The goal being to bracket the researcher's subjective experience of the topic to avoid any influence on the perspectives emerging from the dataset, whilst not forgetting the social context and constructs within which the data (and participant/researcher experiences) sit. Congruent to a hermeneutic phenomenological approach, "the meaning

of experience [is] informed by the context in which the experience occurs” (Dibley et al., 2020, p. 46).

To ensure any bias is considered explicitly, the researcher reflected on her own yoga narrative. To accommodate this, in-built into the research design is a process known as the ‘hermeneutic circle’, a key feature of Heideggerian hermeneutic phenomenology, highlighting the alignment of this methodology to the research topic. The Heideggerian branch of interpretive phenomenology specifically encourages a researcher’s experience of the subject to inform analysis, with the data in turn informing the researcher. This reciprocity describes a circular path of understanding or a “reflective-interpretative process” (Moustakas, 1994, p. 10). The circularity enabling the researcher to both place the data in the foreground and overlay their own experiential viewpoint. To view the data from this Heideggerian perspective, i.e. “being-in-the-world” (Finlay, 2008, p. 8) of participants and research questions, the researcher explicitly stated her own experience of yoga’s downstream impacts *before* the recruitment phase¹²⁵.

The joint endeavour, of both researcher and participants making sense of their practice, is an integral feature of phenomenological analysis aimed at clarifying “shared meanings” (McConnell-Henry et al., 2011, p. 29). A shared meaning is borne from the researcher being embedded in the research topic, or as Moustakas (1994) clearly stated, from the researcher being “intimately connected with the phenomenon” (p. 59). This strengthens the argument for the chosen branch of interpretive phenomenology, given the researcher’s commitment to a yoga practice is conducive to the research methodology rather than contaminating the field. As van Manen (2014) affirms, the researcher’s experience of the topic facilitates the “meaning-giving method of inquiry” (p. 28) that is phenomenology. Making sense of participants’ experiences requires an awareness of ‘intersubjectivity’, defined by Smith et al. (2022) as a “shared, overlapping and relational ... engagement in the world” (p. 13), that facilitates our understanding of others.

Yet, imperative to the transparency is the need for reflection on any preconceived ideas of different impacts of a yoga practice versus other movement modalities. The underlying research premise is questioning whether yoga influences a parasympathetic shift; a concept borne out of both the literature and the researcher’s own experience of yoga with the resultant shift in emotions, energy, and the felt sensation post-yoga versus

¹²⁵ Researcher reflections in response to the prompt: ‘What is yoga?’ were recorded in the Introduction chapter (Section 1.2.1) to provide a comparison at the start and end of the doctoral journey.

other movement modalities, e.g. running or strength training. These personal (researcher) narratives are brought to the surface within this thesis to ensure transparency. Rosenblatt and Wieling (2019) name this self-reflective process as one of affirming the “experiential groundings” (p. 52) from which the researcher approaches the data. In addition, peer review of the data analysis enables explicit questioning of any subtle bias that may have been overlooked. Any such instances of bias (whether noted by the researcher or peers) should be recorded (for transparency)¹²⁶. A key framework to limit bias is to ensure that findings are supported by an evidence base that is sufficient in both quantity and quality, with the participant narrative clearly identifiable (Rosenblatt & Wieling, 2019). Thus for the qualitative data, both theme frequency (quantity) and rich verbatim quotes (quality) provide sufficient breadth and depth of evidence. It is however important to remember that no data remains “untouched by the researcher’s hands” (Silverman, 2007, p. 55).

3.3 Research Design and Methods

This section provides the rationale supporting the selection of a design and methods that best suit the research questions under study, followed by a detailed description of the research process.

3.3.1 Refinement: Research advisory group and pilot study

Firstly, to identify any limitations within the initial research design, and consider alternative perspectives from a yoga, health, and research informed population, the researcher approached local yoga industry contacts and a health practitioner/researcher to act as an informal advisory group providing feedback on the initial protocol. To ensure that the research design would provide data relevant to the questions, and that the topic resonated with the proposed population, a pilot was completed in 2017 with three key informants (experienced yoga practitioners) who had a minimum of 2-years yoga practice tenure (n=1, age category 26 to 35-years; n=2, age category 46-55-years). These key informants were selected via a local yoga teacher social media page and informal local

¹²⁶ Researcher reflections are incorporated in the Discussion chapter. Peer review found no evidence of bias.

networks, to incorporate the perspective of both yoga teachers and students (Conboy et al., 2010; Park et al., 2014; Park, Braun, et al., 2015; Yoga Alliance & Yoga Journal, 2016). Of the three pilot participants, one was a yoga teacher. The rationale behind the pilot was both practical (to minimise inefficiencies) and exploratory (to inform the protocol).

Accordingly, the online survey was refined to reduce repetition and/or time-burden. Pilot participant narratives resulted in the inclusion of two interview questions to (i) explore whether practitioners had known strategies to support commitment to practice; and (ii) whether intention setting was a feature of practice. A key take-home from the pilot study was the distinctive journey *to* yoga for each participant — how and why they began their practice — juxtaposed with the similarity of their experience *of* yoga, such as awareness of the body–mind connection and the calming effect of a yoga practice. A summary of the data collation methods, and how the data relates to the research questions, is presented in Table 2 (in section 3.4.2).

The protocol was approved by the AUT Ethics Committee (AUTEC)¹²⁷ in December 2016 (Appendix A). In 2017/18 the protocol went through two major iterations over time. Firstly, a move overseas by the initial primary supervisor resulted in a change of the supervisory team (which is noted in the amended ethical approval in Appendix A). This change required an amendment to the design, such that a focus on subjective wellbeing — including access to a national wellbeing dataset — was removed in order to focus more directly on the experiential impacts of a movement practice on participants' lives, which remained the researcher's central point of interest. A participant information sheet¹²⁸ was completed in May 2018 to fully inform interested yoga practitioners in accordance with AUTEC guidance (Appendix B), i.e. detailing the purpose of the research study, any risks and/or benefits to participating, protection of participants' privacy, etc. As noted in the Findings chapter (p. 124), pseudonyms were used throughout to ensure confidentiality. Data management incorporated two layers of password protection, for computer access and for specific data files.

The second protocol change necessitated the removal of a comparative movement practice (that of committed gym practitioners) due to a lack of participation from the gym community. Despite a lengthy recruitment phase that included attendance at a national

¹²⁷ AUTEC Reference number 16/307, as per Ethics Approval (Appendix A).

¹²⁸ The participant information sheet details the use of a mobile phone app to collate heart rate variability data. This objective dataset may form part of future publications but is not included in this thesis in order to highlight the extensive qualitative data provided by participants.

industry conference, the gym participant numbers proved insufficient to be included as a movement practice comparator for this thesis. A further decision was made to not include the objective HRV data (as noted in footnote 25, p. 20 and footnote 129, p. 82) in order to foreground the experiential data as the best fit for the research questions.

Any changes to the ethical requirements of the study were provided to AUTECH by the researcher as per standard AUT procedures¹²⁹, in addition to the provision of annual research progress reports to AUTECH. To add another layer of ethical consideration, Dibley et al. (2020) propose that an explicit awareness of the researcher stance is an ethical imperative to ensure that the interpretation of the data retains the integrity of participants' narrative.

3.3.2 Design guided by experience

The design sits within a 'real world' or "community-based yoga research" framework (Wertman et al., 2016, p. 191), collating data on a yoga practice within the context of participants' lives. This is in contrast to a research or clinical setting that 'prescribes' a movement 'intervention', i.e. controlling elements of practice, such as duration and frequency. The decision to step outside of an interventional approach and consider a yoga practice from the experience of the practitioner flows directly from:

- i. the research premise;
- ii. the underlying qualitative methodology that informs the research design; and
- iii. the researcher's intention to not impose a practice on participants, but rather be a curious observer.

Further to bullet (ii) above, the 'real world' design aligns with a naturalistic perspective, which assigns import to context. More specifically, an interpretive constructionist approach to qualitative research accounts for the meaning (or narrative) through which participants view experience, or their subjective filter (Rubin & Rubin, 2012).

As noted prior, a 'real world' approach does differ to recommendations for research to tease apart specific components of yoga, in order to consider the optimal application of the practice to a specific condition or population, such as chronic low back pain (Anheyer

¹²⁹ As noted by an amended approval in May 2018 to allow consent to be gained via email (Appendix A).

et al., 2022); or to design yoga protocols that can be applied akin to a pharmaceutical drug, to optimise yoga dose to outcomes (Cook-Cottone, 2013; Estevao, 2022; Pascoe et al., 2021). This contrasting approach in yoga research methodology simplifies, or compartmentalises, a practice in order to study unique aspects of a practice, and thereby aims to limit potential mediators and moderators in action (Vergeer & Biddle, 2021). This approach is often guided by the fields of yoga therapy and physiotherapy within clinical populations, whereby a specific yoga sequence (of movements or *āsanas*) or a yoga protocol is applied as one arm of a randomised controlled trial to compare the effects of a yoga versus a non-yoga intervention. While limiting parameters under investigation may increase the potential to associate variables to outcomes, Vergeer and Biddle (2021) do acknowledge that simplifying a practice does negate elements of the whole, and that qualitative research is well placed to explore the fullness of an 'holistic movement practice'. It is exactly this 'fullness' of practice, i.e. capturing participants' individual yoga practices without set parameters, that is at the core of this study's design.

Thus, a yoga practice has purposely not been defined for this study. The decision to avoid a yoga prescription and consider a lived yoga practice (within the context of participants' lives) flows directly from the research questions, and the researcher's own yoga practice that has shifted alongside life's transitions. A unique feature of this study is the lack of a specified movement 'intervention', in favour of collating participants' lived experience of their practice. Rather, the practitioners themselves define their yoga practice, e.g. their style(s) of yoga, and whether meditative practices are incorporated versus a purely movement-based practice. Whether any differences emerge between participants that do or do not incorporate meditation within their practice will be considered.

3.3.3 Mixed Methods

The design priority in this study was to select qualitative methods grounded within the phenomenological methodology, in order to facilitate access to the subjective experiential narrative, both at an individual level and across the dataset. This experiential lens is supported by quantitative measures to provide a mixed-methodological approach. Whilst the quantitative methods provide a different, and arguably more objective, access point to participants' experiences of practice outcomes, Smith et al. (2022) argue that the qualitative perspective can provide a personal context — the 'meaning' — to those

outcomes that can offer a more nuanced interpretation.

The chosen qualitative (in-depth semi-structured interviews; online open-ended questions) and quantitative (online outcome measures) methods were informed by the literature. As Guest et al. (2012) recommended, mixed methods should only be selected as an approach if it offers the potential for increased clarity in response to research questions. An online survey tool accessed participants' health habits with the inclusion of self-efficacy (as it pertains to diet and physical activity) and overall activity levels in addition to participants' specified primary movement practice (yoga). Semi-structured interviews and open-ended online survey questions, combined with a measure of interoception, provide the experiential lens of adherence to a yoga practice. Interoception represents a visual of the internal neural landscape. Interoceptive awareness may support self-regulation (in the context of pro-health habits or behaviour) from a physiological (PSNS) perspective.

Consequently, a mixed methods study was chosen, with the caveat being that the study is based first and foremost on a qualitative methodology, supported by quantitative measures. Positioning interpretive phenomenology front and centre, as the principal approach, enables subjectivity to be brought to the surface. Experiential data is pivotal to phenomenology, thus (as noted earlier) the emphasis is on "first-person insight" (Lutz & Thompson, 2003, p. 49). It is through experience that one seeks a "unified vision" or a theme across different perspectives (Moustakas, 1994, p. 58). Both practitioners' experiences (accuracy) and depth (rich data) are key factors in a thorough qualitative design; whereby richness invites participants to fully share their experiences, and from which a variety of themes and common threads may emerge, with the potential to explore new concepts via theme combinations (Rubin & Rubin, 2012).

To access participants' practice details, the specific parameters of a weekly practice were collated. The practice components thus included the average duration of each practice session; the weekly frequency of studio attendance and/or home practice; and a record of the varieties of yoga style participated (such as yin versus hot yoga, or strength versus aerobic practice respectively), with or without meditation. The aim being to tease apart the variables that align to a committed yoga practice across the dataset, i.e. by practice tenure.

3.4 Research Process

This section provides a roadmap of the complete research process, from participant recruitment; to the collation of both quantitative and qualitative data; and finally, to the methods of data analysis.

3.4.1 Recruitment: Population

The eligibility criteria were based on a self-selected adult cohort (aged 18 to 65-years) with a committed yoga practice (minimum 6-months tenure) and access to a smartphone¹³⁰. For inclusion, practitioners considered their yoga practice to be their primary mode of physical activity or exercise. Those with a yoga practice tenure of at least 2-years are considered to be long-term practitioners in the literature (Kiecolt-Glaser et al., 2011; Satin et al., 2014). An adult age criterion was established due to a desire to seek practitioners who had lived with their practice long enough to experience, and be aware of, resultant changes in their lifestyle. The upper limit was set simply to refine the thesis narrative given the limits of a doctoral research timeframe and the focus of yoga/exercise literature on older populations towards addressing cognitive and physical decline (or ill-health), rather than a pro-health agenda.

Purposive sampling was employed at yoga studios located around NZ offering a range of yoga styles on their schedules. This strategy was geared towards accessing a population relevant to both the research topic and the design (non-restrictive with respect to practice), in order to capture a range of experiential narratives. Sampling from this perspective seeks to access sufficient “experiential data sources” to understand the phenomenon under study, rather than a specific quantitative target (van Manen, 2014, p. 353). Studios were provided with email copy to circulate to their members, and advertising in the form of posters and postcards to place on their reception counters (see Appendix C). The researcher’s connectivity with the yoga community — or as Dibley et al. (2020) denote: the ‘situatedness’ of the researcher — expedited recruitment. Interested practitioners contacted the researcher direct via email, at which point an information sheet was sent (see Appendix B). Recruitment was variable across locations, and a small

¹³⁰ The initial research design included the measurement of heart rate variability using a smartphone app. This data does not feature in the thesis to focus on the participant experiential narrative while remaining within the constraints of the doctoral project.

percentage (n=2; 5.3%) of participants heard about the study via word-of-mouth, opening up the range of studios beyond the researcher's network such that participants were located around the North Island of NZ, and based out of Christchurch and Dunedin in the South Island.

Participants were guided through the research process via a pre-prepared email stream designed initially to provide detailed information on the eligibility criteria and study requirements¹³¹, and post-consent to offer instructions regarding the online survey access. Participants were advised that they could opt out of the study at any stage of the data collation process. After data collation participants retained their right to either withdraw their data or agree to its continued use until research findings were drafted, at which point removal of data would likely not be feasible.

All participants completed the online survey, while a 20% subset were invited to partake in the virtual face-to-face interviews (of which all agreed). This interview cohort were randomised¹³² from the lowest (6-months to 2-years) and highest (>10-years) practice tenure categories, thus providing the opportunity to consider the concept of adherence by comparing the experience of practitioners with a long-term yoga practice to those with <2-years practice.

3.4.2 Data collation

It is clear that RQ1¹³³ benefits from an experiential lens to fully engage with the potential breadth of downstream practice impacts, and to enable participants to share their unique journey of practice. A survey tool and interview guide offered a road map with respect to pro-health habits to ensure that data relevant to RQ2¹³⁴ was collated and that selected interview questions were replicated on the survey for consistency and triangulation. Open-ended questions allowed the participant narrative to emerge, despite researcher bias being ever-present in the choice of questions.

¹³¹ The participant information sheet and consent forms shared with participants are included in Appendix B. A total of three interested yoga practitioners decided not to partake after receiving information on the study requirements. Two withdrew their interest because of the requirement to purchase a phone app, even though the cost of the app was fully reimbursed once their app data was shared with the researcher. One practitioner, on reflection, felt that they were too busy.

¹³² The [Research Randomizer](#) (a free online resource) was used to randomly select the interview cohort from the two tenure categories.

¹³³ **RQ1:** How has a movement practice (yoga) impacted practitioners' lives 'off-the-mat'?

¹³⁴ **RQ2:** Is there a relationship between adherence to a yoga practice and pro-health habits?

Open-ended survey responses for all participants were combined with in-depth semi-structured interviews with a cohort representing 20% of all participants. To restate, this interview cohort was randomly selected from two categories of practice tenure of either 6-months to 2-years, or ≥ 10 -years, i.e. low versus high practice tenure. The summary table below (Table 2) clearly aligns the choice of method and data type (variables) to the key topics of interest. Open-ended survey questions are listed in Table 3 and include both practice specific questions (to offer a contextual map of practice within the cohorts) alongside questions on health behaviour. An interview guide (Table 4) was established to ensure consistency — both inter-reliability between interviewees and intra-reliability across data sources — via the inclusion of a subset of the interview questions within the online survey, chosen to capture information of relevance to the research questions.

Table 2

Relationship of data collation methods to research questions

Method	Data Type	Research
Qualitative		
Thematic analysis (breadth) Frequency count: coded items	Open-ended online survey responses (n=38; both cohorts) Interview transcripts (n=8)	Practitioner experience of practice on and off the mat (RQ1), adherence and pro-health habits (RQ2)
Interpretive phenomenological analysis (depth)	Interview transcripts (n=8)	Practitioner experience of practice on and off the mat (RQ1); adherence and pro-health habits (RQ2)
Quantitative		
Statistical (descriptive) analysis	Online survey measures: practice components (tenure, frequency, duration, home practice, teacher status); health habits (smoking, alcohol, sleep quality); self-efficacy (nutrition/physical exercise); interoceptive awareness; activity level (in prior week).	Correlation between yoga practice components and outcome measures including pro-health habits (RQ2)
	Studio attendance data (for 1-month prior to date of consent to participate)	Triangulation with self-report of weekly yoga practice and activity (validity check).

3.4.2.1 Qualitative breadth: Online survey

The online survey included socio-demographic questions, namely participants' gender, age (categorised into 10-year age groups), the ethnic group(s) they identified with, highest academic qualification, and current employment status. With respect to gender, the survey did offer an alternative option to a binary choice — an 'Other' category — and all of the baseline characteristics provided the opportunity for participants to choose not to respond. More recent discourse has expanded survey categories by gender identity to incorporate non-binary gender identities and/or gender fluidity. For example, Stats NZ Tatauranga Aotearoa published a refreshed statistical standard in 2021 for collating gender statistics based on a robust review process that utilised consultation with the public, community advocates, and subject matter experts; the aim being to collect data that is inclusive and in line with the Human Rights Act 1993 (Stats NZ, 2021). Consequently the current best practice protocol in NZ (for the purposes of this study¹³⁵) would recommend using a category of 'Another Gender' with space for respondents to define their own gender identity/identities. (Stats NZ, 2021).

Additional quantitative variables were incorporated within the online survey. These independent variables include practice tenure (from 6-months to >10-years); practice duration (average daily practice) and frequency (per week); health habits (smoking, alcohol intake, sleep quality); and three validated measures: dual Self-Efficacy Scales (SES) for nutrition and physical exercise, the Multidimensional Assessment of Interoceptive Awareness (MAIA), and the short form of the International Physical Activity Questionnaire (IPAQ-SF) (all outlined in more detail below). Inclusion of online outcome measures was based on relevance to research questions; measures used in the literature; and the goal of exploring experiential qualities of a yoga practice, such as interoception (Brisbon & Lowery, 2011; Ivtzan & Papantoniou, 2014).

¹³⁵ This study did not require identification of transgender or gender fluid respondents, nor is the data required for external sources. In these circumstances, the guide produced by Stats NZ (2021) recommends the use of 'another gender' as an alternative to binary categories, with the opportunity for multiple responses according to respondents' individual gender identities.

Table 3*Open-ended online survey questions*

Online Survey Questions	
What does a YOGA PRACTICE mean to you?	Do you feel that your yoga supports you to be active in other ways? (Not open-ended: Yes/No)
What motivated you to start yoga?	
How do you feel after a session on your mat?	If Yes, how does your yoga practice support you to be active in other ways?
Overall, what kind of effects has your yoga practice had on your physical health?	Does your yoga practice support you in your dietary choices? (Not open-ended: Yes/No)
What kind of effects has your yoga practice had on your sense of wellbeing or mental/emotional health?	If Yes, how does your yoga practice support you in your dietary choices?
Has your yoga practice provided any benefits beyond your expectations?	In what ways do you feel supported by your yoga practice, in your life in general? Please share any thoughts.
Do you practice yoga when you don't feel like it? (Not open-ended: Yes/No)	If you were to promote yoga to others, what would you choose to highlight?
If you would like to, please share why you practice when you don't feel like it.	Please use this final opportunity to write down anything you feel is relevant to your yoga practice that you have not had the chance to share during this survey.

Online survey questions and interview guide (Table 4) support data triangulation

The survey questions on smoking, alcohol intake, and sleep were selected from the Sovereign Wellbeing Index (Human Potential Centre AUT University., 2015), and modified for alcohol and sleep to a 7-day recall period (versus 4-weeks) to match the recall of another included measure (the IPAQ-SF). Select demographic questions were also replicated from this Index given that it was specific to New Zealand, for example with respect to indigenous tribes/iwi (Māori ancestry) that participants may identify with. The three incorporated measures were chosen specifically to collate information on self-efficacy with respect to diet and exercise; awareness of interoception, i.e. embodiment; and the full extent of participants' physical activity in addition to their yoga practice. Broadly-speaking, these measures encompass self-regulation within the context of pro-health behaviour.

Table 4

Interview guide

Guide Questions*
How would you describe your yoga practice?
Can you recall what the initial motivation was to go to yoga?
What motivates you to maintain your practice?
What is it about yoga that keeps you coming back?
Do you set yourself an intention when you go to your mat?
Was there a point in time, or a defining moment, when you knew this practice had become a regular routine for you?
What are the biggest impacts of your practice?
Do you think your practice supports your lifestyle and/or your health? If so, in what ways do you feel supported?
If you were to project your mind forward, how do you see your practice in say 5-10 years from now?
Feel free to share anything else that comes to mind when you think of your practice and yoga.

**To enable free flow of conversation, questions were not asked if the participant discussed the subject matter in the course of their narrative.*

A long-held concept relevant to pro-health behaviour — self-efficacy — originated in the 1970's (Bandura, 1977). It can be defined as an individual's belief in their own capability (or skill set) to effectively undertake a task — or in this context adopt a behaviour — and is positively linked to adherence (Buchmann, 1997). Self-efficacy is an important mediator with respect to the uptake of health behaviour and has therefore been embedded within the protocol. The dual self-efficacy scales incorporated within the online survey — The Nutrition Self-Efficacy Scale and The Physical Exercise Self-Efficacy Scale (Schwarzer & Renner, 2018) — have been significantly correlated to health behaviour. Given their relevance to the topic and their brevity as a tool, both SES measures were included despite limited application at the time when the survey tools were selected. For nutrition, self-efficacy relates to respondents' self-report of certainty to situations that follow the primary statement: 'I can manage to stick to healthful foods, ...'. For example: '... even if I have to make a detailed plan.' Similarly for exercise self-efficacy the primary statement is: 'I can manage to carry out my exercise intentions, ...', with a situation such

as ‘... even when I am tired.’ In response to the question ‘How certain are you that you could overcome the following barriers?’, both scales provides four options of certainty, from very uncertain, to rather uncertain, to rather certain, and very certain, with the option to not answer (Schwarzer & Renner, 2018).

The Multidimensional Assessment of Interoceptive Awareness (MAIA) scale has been positively linked to psychological wellbeing (in 7 of 8 items), thus illuminating the body-mind experience of felt-sensation and thought (Hanley et al., 2017). Specific subscales (items) from the MAIA (version 2) were selected for inclusion, to access relevant data whilst keeping the number of responses required by participants to a minimum (Mehling et al., 2018). The selection was directed towards statements categorised as noticing (4 statements), emotional awareness (5), and body listening (3). Examples of statements from these categories include the following:

- I notice where in my body I am comfortable (Noticing);
- I notice that my breathing becomes free and easy, when I feel comfortable (Emotional Awareness); and
- I listen to my body to inform me about what to do (Body Listening).

(Mehling et al., 2018)

This self-report questionnaire asks respondents to score their answers on a scale of zero to five with respect to how often each of the statements apply to daily life, with zero equating to ‘*never*’ and five to ‘*always*’; as in I never or I always notice etc. (Mehling et al., 2018). These three MAIA categories relate to embodiment or “bodily awareness” (Hanley et al., 2017, p. 18), which as noted earlier may positively impact behaviour through the development of an inner awareness of the body’s needs, or a kind of internal homeostatic guidance system. A guidance system that may have been developed through a yoga practice, and potentially any or all movement practices. Given yoga’s fit within holistic movement practices, this body-wide mapping provides a visual representation of the practice’s whole-body influence, alongside the body-mind perception or felt experience of the downstream effects.

In addition, the short version of the International Physical Activity Questionnaire (IPAQ-SF) is a standardised and validated tool to record participants’ activity levels in the week prior to completion of the online survey (Craig et al., 2003). One minor amendment to the language used in the IPAQ-SF allowed for cultural context, with the word ‘yard’ replaced with ‘garden’. Whilst the IPAQ-SF does have limitations with respect to accuracy

of respondent's physical activity levels — for example, a mean over-estimate of 106% was reported in a systematic review of (n=23) validated studies (Lee et al., 2011) — the over-estimation of activity levels is a known limitation of self-report measures (Nelson et al., 2019); in part dependent on the degree of recall required. For example, a study by Neuhouser et al. (2013) — albeit in a specific population (n= 450; postmenopausal women aged 50-79 years) — found that a 7-day recall resulted in over-estimation of physical activity, compared to an under-estimation over 28-days.

Accuracy of recall may not be the only mitigating factor. Social identification as a yoga practitioner could lead to an exaggeration and/or inaccurate representation of a yoga practice in order to fit a social ideal; a concept labelled as “social desirability bias” by Nelson et al. (2019, p. 544). Mindful of the limitations of self-report, attendance data (where available) was collated from studios (for the month prior to consent to participate). Data release from the studios required an additional layer of consent from participants, though most often it was the participants themselves who requested this information from their local establishment. This external data source offers a direct comparison with self-report of each participant's weekly yoga practice via the online survey, and thus provides a triangulation point with the practice data from the survey and interviews. By using multiple data sources, any measurement error associated with self-report can be moderated (Ferrari et al., 2007). To complete the survey, selected semi-structured questions from the interview guide were replicated in the survey. This enabled a check of consistency, or reliability, of participant responses (within the interview cohort), though mindful of the limitation of survey responses.

3.4.2.2 Qualitative depth: Interviews

The interviews explored participants' experience of their primary movement practice (yoga), and whether they perceived any relationship between the practice and their health and/or lifestyle. A direct comparison of emergent themes from the interviewees' experiential accounts with online responses (across the cohorts) enabled cross-checking or triangulation (as noted above). Refinement of coding using both written transcriptions and audio-recordings of the interviews¹³⁶ provided the nuance of narrative tone to the collaborative interaction or 'jointly constructed reality' that interview data represents

¹³⁶ Interview recordings via videoconference opened up recruitment nationally. Note the data was collated pre-COVID so videoconferencing was a design choice rather than a necessity.

(Rapley, 2004).

Given the researcher's own yoga experience, and thus immersion in the subject matter, the inclusion of an interview guide — as noted earlier (Table 4) — establishes consistency of approach and content. But it also prevents the researcher's own interests circumventing the research questions or, crucially, pre-empting or even forestalling a participant's narrative. Semi-structured interviews keep the focus narrow and aligned to the research questions (Rubin & Rubin, 2012). To facilitate data reliability it was crucial to record and transcribe the practitioner's own words, to access the practice experienced by the practitioner, not a researcher-led endeavour. Thus whilst the interview guide ensured all questions were asked, the interview process remained open to the flow of natural conversation (or as natural as it could be given the subject-research dynamic). The goal being to capture vivid experiential examples to bring the narratives to life (Rubin & Rubin, 2012). The use of follow-up questions when appropriate invited subjective nuance, or "shades of meaning" to unfold (Rubin & Rubin, 2012, p. 105).

3.4.3 Data Analysis Methods

The analytical process is clearly outlined in this section, in order to inform the reader step by step how the researcher approached the participant data. The first section describes the analysis of the both the descriptive data (demographics and practice components) and the outcome measures. The second section focuses on the qualitative analysis of the participants' experiential data (from open-ended survey questions and interview transcripts).

3.4.3.1 Descriptive data and outcome measures

Participant demographics and quantitative survey data (numerical online scaled questionnaire responses, such as those with a verbal response scale from '*very certain*' to '*very uncertain*') are quantified and portrayed as mean values and standard deviation. The participants' practice details — collated from the survey and studio attendance data — are described according to practice tenure, types of classes attended (indicative of practice intensity), style(s) of yoga practiced, with/without home yoga practice, and with/without meditation. Practice tenure, yoga dose (multiplication of frequency and duration of a weekly practice), and meditation weekly frequency are the three key independent

variables. Teacher status and a home practice also provide avenues of interest, as possible facilitators of adherence. These two components were interpreted by exploring two comparative groups: participants who were teachers with a home practice (home+teacher) versus non-teachers who did not practice at home (non-home+non-teacher). In addition, two sources of yoga dose were obtained, via self-report on the survey and via studio attendance data (albeit minus the home practice contingent), thus enabling triangulation to consider the validity of the participants' reported weekly practice frequency and duration.

Given the focus of RQ2 was considering any relationship between yoga practice adherence and pro-health habits, any trends within the outcome measures data with respect to practice tenure were considered. To examine any linear associations between three of the yoga practice components (practice tenure, weekly yoga dose, and meditation frequency) and the SES/MAIA outcome measures (or dependent variables), a bivariate Pearson's correlation was performed using the SPSS statistics package version 28 (IBM Corporation, 2021). Pearson's r values and 95% confidence intervals, along with significance ($p \leq .05$), were used to interpret the quantitative data.

3.4.3.2 Participant narratives

Online survey responses captured participants' thoughts on any impacts of a yoga practice that had been experienced in the wider context of practitioners' lives. The focus was on effects that had impacted either participants' experience of health or their health (lifestyle) choices. In-depth semi-structured interviews with 20% of the practitioners provide data from which to tease out subjective experiential themes and offer the chance to explore any patterns in the data according to low to high practice tenure, teacher status, and both yoga practice dose and meditation weekly frequency. Both the online survey open-ended questions and the interviews were designed to target practitioners' viewpoint on any links between their yoga practice and their health and lifestyle, with a particular focus on exercise and diet. Any additional physical activity or exercise, i.e. movement in addition to yoga, reported by participants was verified via two survey sources as a cross-check: a self-report question and the IPAQ-SF measure (both incorporated within the survey).

3.4.3.2.1 Thematic analysis (open-ended survey responses and interview transcripts)

Thematic analysis across both cohorts provides an objective viewpoint from which to survey patterns by theme frequency across the two cohorts. As such, qualitative survey responses from the open-ended questions (as listed in Table 3) from both cohorts were coded and analysed for theme frequency. In addition, the theme frequency for coded items within the interviewee's transcripts were calculated. Initially the plan was to use a qualitative data analysis software in order to provide a degree of objectivity, i.e. removal of the researcher lens. However, the 2-year window between data collation and the latter stages of analysis created a substantial boundary between the role of interview versus researcher. Initial experimentation with the dataset within a data analysis platform confirmed that the nuance of the content was better served by the human eye; a process that felt more grounded in the data. A decision was therefore made to extract theme frequency via thematic analysis within Excel. (See Appendix D for snapshots of the coding process¹³⁷). The search function within Excel facilitated quantification of the coded themes. As noted prior, a quantified approach to the analysis of themes can improve reliability, with scoring enhancing "pattern recognition" (Boyatzis, 1998, p. 7). In addition, it provides an arena for researcher pre-assumptions to be acknowledged and re-considered in light of the data, if theme frequency does not support a concept close to the researcher's heart (Guest et al., 2012). In effect, an additional check for researcher bias, though as noted, the boundary of time between data collation and initial coding, and the stages of refinement towards the identification of themes (see section 3.4.3.2.3), facilitated a more objective access point to the data. An approach to the data that was guided by a curiosity to seek out narratives unique to the participants, i.e. experiences that differed to that of the researcher.

Frequency counts are not a measure of a theme's importance or dominance, but rather delineate the common language, or shared narrative, across participants, i.e. the language participants use to describe their experiences. A low frequency count does not equate to relevance, given that a participant may have either forgotten or chosen not to share a specific example (Braun & Clarke, 2022). As Braun & Clarke (2022) assert, the

¹³⁷ Appendix D includes three snapshots of the coding process: (i) Interview coding from initial thoughts to audio versus transcript coding to refinement; (ii) Survey responses (from survey cohort) coded in Excel for theme frequency; and (iii) Tabulated codes to questions (to get a sense of the key emergent themes).

fact that data collation is both “subjective and situational” (p. 141) negates the relevance of a quantitative count. Yet, the addition of a thematic analysis for the survey responses provides a more objective window on the qualitative data, as a validity check versus the subjective categorisation by the researcher. In order to provide an overview of the frequency count for themes and categories (groups of themes) across the dataset, the frequencies for the interview cohort and the remainder of the participants (identified as the survey cohort) will be tabulated to provide a clear view of the participant (coded) narrative (in Table 17 of the Findings chapter).

3.4.3.2.2 Interpretive phenomenological analysis (IPA): Coding and researcher reflexivity

To further separate the researcher’s practice and perspective from participant accounts, the qualitative analysis of interviews via IPA is a process of systematic coding of participant transcripts to uncover themes, verbatim quotes (or vignettes) that best illustrate “how [participants] ... [make] sense of ... experience” (Frost et al., 2010, p. 445). This focus on participants’ words is an evidence-based technique, in that the evidence (the narrative source) for coding and resultant themes can be explicitly recorded. As noted, incorporating the semi-structured questions (from the interview guide) within the online survey facilitated cross-referencing (triangulation) from two sources (interview transcripts and survey responses), to check for the internal consistency (reliability) of participant responses across formats. A slight rewording of the interview questions aimed to cover the same topics as the survey, whilst pre-empting a sense of repetition by the interviewees to maintain engagement. Triangulation may also serve to identify any researcher-led responses during the interviews, which could differ by some margin from the interviewee’s survey response to the same question, and may signal an interviewee responding to ‘please’ the researcher, or at least represent themselves in a different light to that offered during the online survey. Further indications to be cognisant of are leading follow-up questions or prompts by the researcher.

It is by increasing the reliability of qualitative analysis, that the utility of the hermeneutic circle comes to the fore. The researcher’s lens is apparent from the study’s hypothesis and the choice of both RQs and interview questions. As Pillow (2010) notes, self-reflexivity lays bare the role of the researcher, not only in data analysis, but throughout the research process, from defining the question(s), to the research setting. The

embedded etic¹³⁸ concepts “represent the ... [lens] through which the researcher perceives facts and phenomena in the field under scrutiny” (Kelle, 2004, p. 449), and defined the initial coding schema. The final stage of coding offers a more visual mapping across and within themes (and subthemes) to consider emic¹³⁹ concepts or patterns emerging across the cohort — or “shared cultural understandings” (Atkinson & Coffey, 2001, p. 811) — and establish any inconsistencies or convergence with respect to the researcher’s own frame of reference. As noted prior, peer review of the coding decisions aims to further reduce bias. A different perspective also provides an opportunity to reconsider the coding framework, which may limit constraints to the analysis as a result of reducing participant narratives to categories (Freeman, 2020). The data source, or evidence, is paramount: though interpretation and the naming of themes is undertaken through the researcher’s own lens, an accurate and balanced representation of the participant narrative informs the analysis (Rubin & Rubin, 2012).

3.4.3.2.3 IPA Coding

Data immersion without bias on the part of the researcher requires a considered approach to coding. As noted, the researcher’s ability to bracket her own perspective was facilitated by an extended timeline between the interviews (Dec 2018) and initial coding (May to Aug 2020), and a further time interval before assigning themes, subthemes, and categories (Nov 2021 to Jan 2022). Engaging with the data iteratively over an extended period of time provided space between the data collation and stages of analysis, enabling an objective researcher stance from which “to critically reflect on earlier analyses” (Pillow, 2010, p. 278). Time out to attend to other elements of the thesis provided a natural barrier between interviewee and analyser roles. As such, connection with interviewees who shared narratives that resonated more closely to the researcher’s personal experience of practice had faded by the time the initial coding took place. In addition, the process of literature review provided an external lens through which to interpret the analysis and assign names to themes and categories. An Excel worksheet recorded the initial coding process (in 2020), made up of four stages:

- i. Selection of text from the written transcript, with the source interview question;

¹³⁸ An ETIC analysis is based on researcher concepts (Rapley, 2004).

¹³⁹ An EMIC analysis is driven by participant concepts (Rapley, 2004).

- ii. Assignment of a one-word code to capture the essence of the selected text, such as access, balance, or diet;
- iii. Listening to the audio recording¹⁴⁰ of the interviews, to consider any nuances of the conversation that may re-contextualise the selected text; and
- iv. Initial ideas of themes across the sourced dataset.

In practical terms, a thematic framework offers a structure to codify individual experiences, in this instance moving from a narrow (text selection) to a broad (thematic) lens. Ulin et al. (2005) describe a process of data reduction as a distillation to uncover the “essential concepts and relationships” (p. 160) visible from a broad perspective, though the term ‘reduction’ seems contrary to the expanded viewpoint by which overarching ideas may emerge. In the final interpretative stage (in 2021/22) refinement of themes supported a shift from analysis towards data interpretation, resulting in a broader categorisation (Bathmaker, 2020). Themes were reduced into four main categories that best captured inter-participant narratives of their experiences — or “recurring aspects of meaning” (van Manen, 2014, p. 352) — whilst keeping in mind the context of the research questions. At this juncture, a process review by the research supervisors enabled a cross-check of the source data (for the interview cohort) with the assigned categories and themes/subthemes, to confirm that themes represented participant responses. All decisions made on theme fit for verbatim quotes and survey responses for the interview cohort were tabulated and an example is included in the appendices (Appendix E¹⁴¹) to show the themes in relation to the source material. By recording the data source — coded items — that informed the selection of themes, the reliability (or accuracy) of the data analysis is laid bare. Peer review provided an external cross-check to determine whether the data supported the themes, whilst the act of creating the tables facilitated a “reexamining (*sic*)” (Rubin & Rubin, 2012, p. 207) by the researcher.

Qualitative analysis is a subjective process, and the resultant coded data bears the researcher’s fingerprint. This is best illustrated by the fluidity of thematic coding, with concepts potentially matching more than one theme. Coding decisions are made explicit

¹⁴⁰ Audio-coding provided a more immersive re-living of the interviews, enabling the natural flow of conversation to come to the fore versus the written words.

¹⁴¹ The exemplar table of interview quotes and survey responses (from the interview cohort) coded to a specific theme (‘off the mat’) offers a glimpse into the final stage of interview coding. The first such table to be collated was peer reviewed (by the primary supervisor).

to identify these cross-theme items. The guiding principle throughout the coding process was to identify a single theme that best represented the contextual narrative. Rather than selecting specific words as an abstract coded item within a sentence, the full sentence or group of sentences within which the coded item was situated provided a context that informed best fit to themes or subthemes. This process of assigning a coded item to a single theme or subtheme commenced with a wide schema (multiple themes) before consolidating into fewer (interparticipant) themes grouped into categories. To reiterate, the extended timeframe for analysis allowed the overarching narratives to evolve without the residue of the interviewer stance colouring the researcher's lens, i.e. creating a boundary between the dual roles. Equally, the assignation of a single theme/subtheme name called for an alertness to capture links across themes, i.e. where a coded item had the potential to be dual-coded.

3.4.4 Validity and reliability

Optimisation of validity is a central rationale underlying a mixed methods approach, with validity reinforced by a diversity of data collation methods and data sources (Guest et al., 2012). To provide both breadth and depth of experiential data, an additional analytical method is included in the research design, i.e. a mixed-qualitative approach¹⁴² (Morse, 2009). Thematic analysis of online open-ended survey responses (to a subset of questions replicated from the interview guide) and interviewee transcripts offers breadth (Boyatzis, 1998); in order to observe constructs across the full participant cohort, with the potential to unearth 'group experiential themes' (Smith et al., 2022). Whilst the depth of participants' individual experience is sought via the application of IPA to the interview transcripts (Pietkiewicz & Smith, 2012); the strength of findings determined by the richness and depth of the narrative, rather than sample size (Dibley et al., 2020; van Manen, 2014).

Validity of interpretations is bolstered by the application of thematic analysis to the open-ended survey responses, with researcher effect assumed and transparency recorded (Guest et al., 2012), akin to the hermeneutic approach outlined prior. Boyatzis succinctly defines thematic analysis as "a process for encoding qualitative information" (1998, p. 4). By avoiding the IPA restriction to small sample size (Pietkiewicz & Smith, 2012; The University of Auckland, n.d.), thematic coding may provide access to the "lived

¹⁴² Also termed a pluralistic qualitative analysis (Biggerstaff, 2014).

experiences” of the entire cohort (Guest et al., 2012, p. 13), albeit dependent on the quality of the online responses.

Reliability and robustness of the research protocol is strengthened by triangulation between first-person subjective reports and objective data. Coon and Cook (2018) assert that triangulation is equivalent to statistical significance within the context of ‘real-world’ data. As outlined prior, triangulation of data sources facilitated a cross-referencing of the practice components provided on the online survey (participant recall) versus actual studio attendance, i.e. validation across data types (Bryman, 2006; Mackenzie et al., 2014; Silverman, 2006). With participant consent, access to studio attendance data (for one calendar month) was gained. The attendance data was provided directly from studio to researcher and was retrospective (one-month prior to the date participants signed their consent to partake) in order that their attendance was not affected by their participation. For example, an above normal practice frequency may result from the ‘Hawthorne effect’¹⁴³ whereby participants behave differently simply in response to being studied. Though McCambridge et al. (2014) proposed the use of the term ‘research participation effects’ due to the fact that effects differ across studies, and — of particular relevance to this study — highlighting the fact that studies exploring health outcomes may have a tendency to elicit change “in the direction of better health”. Despite the use of retrospective data to limit research effects, data may still divert from ‘normal’ as a simple consequence of participants being asked to record or discuss topics that they may not have considered prior. Thus the mere act of questioning participants can “stimulate new thinking” (McCambridge et al., 2014, p. 275).

Reliability, or consistency, of data was further enhanced by the use of an online survey tool and an interview guide to support the researcher to replicate scripted questions across participants. Plus, the repetition of questions from the interview guide within the survey (identified in Table 3) provided the opportunity to consider participant responses across sources. Reliability of cross-data findings are dependent on questions being similar across the dataset, with reliability of interpretation verified by, for example, quantitative scoring of theme frequency (Guest et al., 2012). By including thematic frequency within the analysis, the researcher can metaphorically step aside from the interpretive process to enable consideration of popular themes that may not have been

¹⁴³ The ‘Hawthorne effect’ dates back to 1962 and can be defined as “the stimulation to output or accomplishment that results from the mere fact of being under observation (Merriam-Webster Incorporated, 2022b).

immediately apparent (potentially due to bias) without the quantification of the narrative data.

In summary, listed below are the steps taken to check for inter-participant reliability via data triangulation:

- i. Practice components (yoga dose) via online survey and studio attendance.
- ii. Comparison of any other physical activity or exercise (aside from yoga) collated on the survey via a self-report question and the IPAQ-SF responses.
- iii. Comparison of open-ended survey and interview responses to the same questions.

3.5 In Summary

This chapter provided support for the choice of methodology, and the associated design and methods derived from the chosen methodological perspective. In closing, the argument for these choices being an appropriate fit for the research questions is outlined below.

The mixed methods approach and triangulation of data sources enable access to the participants' experiences from a range of angles, whilst providing a degree of validity and reliability. However, Rodham et al. (2015) suggest that the concept of 'trustworthiness' is a more appropriate concept for IPA with respect to the credibility of a study's findings. A number of design features in this study were aimed at strengthening this sense of trust.

The design was guided by experience, not just in terms of the experiential data being central to the questions under study, but by the researchers' own experience of the research topic. Rather than being a hindrance, the very fact that the researcher is herself a yoga practitioner provides an insider perspective that can enhance the analysis (Dibley et al., 2020). As Dibley et al. (2020) point out: "[The] connectedness between researcher and research ... [is] not viewed as an undesirable bias but as an essential contextual component ... which requires self-awareness and critical reflection." (p. 44) Indeed, one could argue that the self-awareness gained through yoga is a skill that can be employed in bracketing oneself from the data. The more self-aware the researcher, the greater the potential to reflexively view their own influence (Rodham et al., 2015).

By explicitly providing researcher reflections within this thesis, the goal is to unearth any unconscious bias so that it can be brought to the surface and openly considered (in the Discussion chapter). Hindsight can uncover biases that were previously hidden. In addition, the reader can make up their own mind regarding any 'intrusion' of the researcher on to the participant narrative (Rodham et al., 2015). Given the naturalist (non-clinical) setting of this doctoral study, simply collating each participant's practice, i.e. to minimise researcher input, was a priority; though cognisant that the act of recording one's practice (for research purposes) is sufficient for participants to modify normative practice and/or exaggerate their recording beyond actual events. The triangulation of data sources aimed to limit this effect.

During data analysis, reflections on participant narratives were recorded in order to provide the opportunity to uncover any researcher 'prejudgments', or the researcher's personal lens (Moustakas, 1994). Thus, reflections include the researcher's relationship to her yoga practice before and after the research process (in the Introduction chapter) and reflections on the participant experiential narrative (in the Discussion chapter). Peer review — or consensus (Rodham et al., 2015) — at the initial stages of IPA coding sought confirmation on the fit of themes to data. The extended analytical timeframe also served as a boundary between the role of interviewer to that of interpreter, thus facilitating the bracketing of any resonance with interviewee's personal accounts, and ensuring the participants are the source for the narrative. A marker of quality in IPA studies is an interpretation derived from the data; one that 'amplifies' the participant voice (Smith et al., 2022). Transparency of the analytical process, and the combination of group and individual perspectives, also engender trust in the findings (Smith et al., 2022). With that in mind, the participants' experiences come to the fore in the Findings chapter.

CHAPTER 4: FINDINGS

It kind of feels like I'm embodied in my life in a very liberating way.

4.1 Overview

This chapter presents the quantitative findings first, including the socio-demographic and online survey data, then the qualitative findings (from interviews and open-ended survey responses) are collated as categories, themes, and subthemes with associated verbatim quotes to best illustrate participant's experiences. The research population represented a small sample of New Zealanders who identified as yoga practitioners and, in addition, were interested in sharing details of their individual practice and any impact of yoga on their lives (Rubin & Rubin, 2012). The data were collated in 2018-2019: surveys were completed between June and October 2018, and interviews conducted in December 2018. As such, these findings represent a pre-pandemic perspective. The impact of COVID-19 on yoga delivery and access will be considered in the Discussion chapter, alongside the current health promotion debate.

4.2 Quantitative Data

This section focuses on the survey data, providing descriptive statistics and exploring potential relationships and/or correlations between variables. Participant demographics are presented first, followed by the yoga practice component data and outcome measure results. Finally, triangulation of data considers survey practice details versus studio attendance data, and any additional exercise via two survey sources: a self-report question and the IPAQ-SF measure. The format is kept consistent throughout, with the mean providing a measure of data centrality and standard deviation for data spread.

4.2.1 Online Survey: Socio-demographics

A total of 38 eligible participants took part in the study, of which a subset of 20% (n=8) were randomly selected to be interviewed from the lowest (6-months to 2-years; n=4) and highest (>10-years; n=4) practice tenure categories, and from herein denoted the interview cohort. The remaining participants who only completed the survey (n=30) are denoted as the survey cohort. Despite specifying the inclusion criteria on all study information (see Appendix B), two survey respondents were older than 65 years (one male, one female) and therefore ineligible to participate¹⁴⁴.

The table on the following page (Table 5) provides all participant baseline characteristics, plus those for the interview cohort. To note, numbers by ethnic group are not equal to the cohort, i.e. >38, as the survey accommodated self-identification with more than one ethnicity. Likewise, the numbers by employment type equated to >38, as participants could select more than one option (or provide their own answer) to represent their individual work/home/study context. The majority of participants (n=34/38; 89.5%) were females, with 36 to 55-years being the dominant age (n=23/38; 60.5%), and 78.9% (n=30/38) identifying as European with a tertiary education. More than six additional ethnicities featured, including those within the 'other' category (American, Australian, and Spanish). Most (n=27/38; 71.1%) were in paid employment, with 10.5% (n=4/38) self-employed. A further 7.9% were currently studying while either working or at home with children.

¹⁴⁴ The survey was set up such that any participant who selected an excluded age category was automatically forwarded to the end of the survey. The end of survey screen provided information explaining the reason for exclusion. Both of the excluded respondents emailed the researcher directly to express their disappointment that they could not share their yoga experiences.

Table 5*Sociodemographic characteristics of participants**

Baseline Characteristic		Full Sample (n=38)	Interviewees (n=8)
Gender	Female	34	6
	Male	4	2
Age group	18-25	1	
	26-35	7	2
	36-45	10	2
	46-55	13	2
	56-65	7	2
Ethnic group(s) (Self-identification)	Prefer not to answer	1	
	New Zealand Māori	2	2
	New Zealand European	27	6
	Other European	3	
	Samoan	1	1
	Cook Island Māori	1	
	Tongan	1	1
	South East Asian	1	1
	Chinese	1	
	Other	6	
Highest academic qualification	Prefer not to answer	1	
	Finished primary school	1	1
	Finished secondary school	1	1
	Apprenticeship, diploma, trade certificate	4	
	University Entrance/Bursar/Scholarship	1	
	Bachelor degree or higher	16	4
	Postgraduate diploma / degree or higher	14	2
Employment	Working in paid employment (or away temp)	27	5
	Doing housework, looking after children/other	4	2
	Not in paid work and looking for a job	1	
	In education - or on holiday	1	
	Combination of work and study	2	1
	Self-employed/Own business	4	
	Retired	1	1
	At home mum and studying	1	

**Only those categories selected by participants are displayed.*

4.2.2 Online Survey: Yoga practice components

An overview of the practice component data is presented in Table 6 below, focused on the sample means and standard deviation for yoga practice tenure in years, weekly yoga dose (frequency by duration) in hours, and weekly meditation practice frequency, i.e. number of meditation sessions per week. Of note, meditation data for this study includes yoga *nidra*¹⁴⁵, and the survey did not seek clarification regarding whether meditation may have formed part of a holistic practice with movement and/or breathwork incorporated, or if participants' considered meditation to be a practice of its own. However the different styles of yoga and meditation practiced do provide a snapshot of participants' preferences.

Table 6

Practice component data

(n=38)	ALL Participants	
	Min - Max	Mean±SD
Yoga Tenure (years)	1.0 - 10.0	5.7±3.4
Yoga Dose (hours)	1.0 - 16.0	4.6±2.9
Med Freq (weekly)	0.0 - 8.0	2.7±2.7

Participants' mean yoga practice tenure was approximately mid-way between the study's tenure category range of 6-months minimum to >10-years. With respect to weekly yoga dose for the interview cohort, those with a low practice tenure (≤ 2 -years; $n=4$) had a mean of 5.8 ± 3.0 -hours, i.e. equivalent to the mean for all participants, and approximately one third less of a weekly dose than the mean of 8.5 ± 5.4 -hours for the high tenure interviewees (>10 -years; $n=4$). Albeit in a small sample size, dose did follow tenure for the

¹⁴⁵ The survey question asked: Do you practice meditation or yoga *nidra*?

interviewees. In comparison, mean values for weekly yoga dose in the survey cohort were considered as three tenure groups of similar size as follows:

- Low-tenure (≤ 4 -years; $n=10$) mean yoga dose (hours/week) 3.8 ± 2.4
- Mid-tenure (4 to 8-years; $n=12$) mean yoga dose (hours/week) 4.8 ± 1.6
- High-tenure (>8 -years; $n=8$) mean yoga dose (hours/week) 2.6 ± 1.3

Thus, the pattern of tenure to dose differed to that in the interview cohort, with a peak in weekly yoga dose at mid-tenure for the survey cohort, though this peak dose was lower than that for the interview cohort.

Across cohorts, 47.4% ($n=18/38$) practiced at one yoga studio, with three participants — two of which were teachers — having access to their own studio. A third of all participants (34.2%; $n=13/38$) noted that they practiced at home; and practiced at more than one studio (31.6%; $n=12/38$). Teacher status was not correlated to the use of more than one studio, with just over half of participants using multiple studios (58.3%; $n=7/12$) having trained as a teacher.

With respect to the style of yoga practiced, the full range recorded by participants in order of popularity (number of mentions) was as follows: yin (25), vinyasa/flow (18), Bikram/hot (18), yin-yang (12), *nidra* (12) *prāṇāyāma*¹⁴⁶ (10), power vinyasa (9), hatha (8), Ashtanga (5), hot flow (4), restorative (2), shakti mat¹⁴⁷(2), own practice (2), and then a variety of other styles only mentioned once, e.g. yoga therapy, inversions, and body balance (described as a Pilates/yoga combined class). It is interesting to note that the most common practice was yin, i.e. a passive, meditative style with minimal movement.

Nidra shows up as a style of yoga, albeit it is a meditation. Overall, 68.4% ($n=26/38$) of participants practiced meditation (or yoga *nidra*): comprising 62.5% ($n=5/8$) of the interview cohort and 73.3% ($n=22/30$) of the survey cohort. *Nidra* had the most mentions (12) for meditation style. Other styles recorded were: guided (10), mindfulness (4), meditation during a class (3), vipassana (3), and sound meditation (2). Meditative styles that had a single mention were breathing, open-eyed and transcendental, with one participant simply stating that they used a variety of meditation techniques, without any

¹⁴⁶ As noted in the Introduction chapter, *prāṇāyāma* denotes breath control or a breath practice.

¹⁴⁷ A 'Shakti Mat' (Shakti Mat NZ, 2022) is a mat that provides acupressure when laid on, and is a prop that has been incorporated in classes by yoga studios.

further clarification. The guided meditation classes included examples were participants clarified that their meditation practice was simply that offered during other yoga classes (3), and the use of meditation apps. This data provides a window into the lived yoga practice of participants, with the vast majority of participants integrating multiple styles of yoga into their practice. All but one of the interviewees (7/8) had at least three yoga styles in their repertoire, with the exception being a pure Ashtanga practitioner. Likewise, only 10% (n=3/30) of the survey cohort practiced just one style of yoga, with another 13.3% (n=4/30) practicing two styles.

As noted in Table 6, the mean weekly meditation frequency (Med Freq) across all participants was 2.7 ± 2.7 times per week. Unlike the upward trend in yoga dose associated with tenure for the interview cohort, the mean meditation frequency for high tenure interviewees was exactly 50% lower (1.25) than their low tenure counterparts (2.50). In the survey cohort, the highest and lowest tenure groups had a similar weekly meditation frequency, and the 4 to 8-year tenure group had the lowest frequency:

- Low-tenure (≤ 4 -years; n=10) mean Med Freq (hours/week) 3.9 $\pm$ 3.0
- Mid-tenure (4 - 8-years; n=12) mean Med Freq 1.6 $\pm$ 2.1
- High-tenure (>8 -years; n=8) mean Med Freq 3.5 $\pm$ 3.3

Thus meditation frequency did not have the same pattern as yoga dose with respect to tenure. To note, the non-meditators (n=11/38) are viewed within the context of self-regulation in the Discussion chapter.

4.2.2.1 Triangulation of practice component data

Studio attendance data were compared with online survey weekly practice parameters to provide a measure of validity. Triangulation was completed for seven of the interviewees (n=7/8 total) and a randomised audit of one third of participants (n=10/30 total) from the survey cohort. The interviewee that was not included had a regular self-guided practice and thus did not attend a studio, whilst one participant from the randomised survey cohort advised via email that they attended “too many studios” making it infeasible to access attendance data. As such triangulation was undertaken for 16 participants in total. To clarify, the survey data captured a participant record of their ‘usual’ practice with no timeframe specified, i.e. simply asking how many times a week they practiced yoga (excluding teaching) and how long their average daily practice was, i.e.

their yoga dose. The studio attendance data provided a snapshot of a yoga practice for the month prior to partaking in the study. Or to be specific, the month prior to the date that each participant signed their consent form. So, whilst this may not fully represent participants' practice, e.g. if other commitments took priority that month, or if participants were on holiday, the attendance data captured real world data outside of the study. The comparison of weekly practice frequency and duration (yoga dose) at participants' respective studios was aligned with survey data for the majority of the interview cohort, but less so for the survey cohort. Small discrepancies were allowable, such as a survey response from an interviewee stated that an average practice duration was 75-minutes versus their studio attendance of 68-minutes average. Table 7 provides an overview of the triangulation data, with a tick for agreement between data sources and either a plus or minus sign where intra-rater reliability is in question (indicating on over or underestimation respectively). These inconsistencies may be due to simple memory recall; the experiential quality of time spent in a yoga class, such as a class feeling longer than it actually was; or the participation effect whereby participants may have conflated their only survey data.

For practice frequency seven interviewees provided survey responses that matched their studio attendance data. As noted in Table 7 (to follow), two participants from the interview cohort overestimated their average practice duration, thus representing a malalignment across data sources. Triangulation confirmed that only 50-62% of classes attended were of the duration stated on participants' respective surveys. In the randomised audit of 30% (n=9) of the survey cohort, practice frequency was congruent across the survey and attendance data for just three participants. One participant underestimated their actual attendance frequency (recording twice a week versus attendance of three to four classes a week), and five overestimated their weekly yoga frequency. Of note, one of the survey respondents who overestimated practice frequency — recording seven times a week versus actual attendance of twice a week — was dealing with an injury, so it is possible that they recorded their non-injury practice on the survey, or may in fact have recorded frequency of all exercise¹⁴⁸. Practice duration for the survey cohort also had a low congruency rate, with yet again just three (one third) of the participants audited recording duration data that matched their attendance. One participant underestimated practice duration, recording 30 to 45-minutes (mins) versus

¹⁴⁸ An email communication regarding attendance data included details of walking and strength training.

their studio attendance data wherein all classes attended were 45 to 60-mins in length. Duration data were not provided by two studios of the audited participants.

Table 7

Triangulation of attendance versus survey data

Cohort	Frequency Classes/week	Duration Mins/Class
Interview	✓ (n=7/8; 87.5%)	✓ (n=5/8; 62.5%) + (n=2/8; 25.0%)
Survey	✓ (n=3/30; 10.0%)	✓ (n=3/30; 10.0%)
Random audit of 30%	- (n=1/30; 3.3%) + (n=5/30; 16.7%)	- (n=1/30; 3.3%) + (n=3/30; 10.0%) NO DATA (n=2/30; 6.7%)

✓ *Triangulation Congruent, i.e. studio attendance data matched participant survey data*
+ *Survey data overestimation versus actual attendance*
- *Survey data underestimation versus actual attendance*

4.2.2.2 Yoga teacher status and home practice

Of potential relevance to adherence, yoga teacher status and home practice data were explored. The assumption being that both factors are indicative of a committed yoga practitioner, with a home practice also facilitating practice through ease of accessibility. Approximately a third of participants (34.2%; n=13/38) had trained as teachers, with training dates ranging from 2002, to being in the midst of training, or just graduated at the time of the survey. Not all trained teachers were actively teaching yoga: some out of choice (e.g. they completed training to improve their own practice, rather than to become a teacher); and others due to life commitments (such as children).

While analysing the data, the researcher noted that clarification regarding whether a home practice was self-guided or taught (e.g. audio/video classes) may have added to the analysis with respect to practice adherence. It is likely that teacher status would be the

primary variable to correlate with a self-guided practice, with the potential exception of participants who practiced Ashtanga (n=5), given that Ashtanga is a repetitive style of yoga that lends itself to solo practice once the sequence(s) have been learnt, though three of the five participants who recorded Ashtanga as a yoga style did also identify as teachers. As noted prior, 34.2% (n=13/38) of participants had a home practice, with exactly the same percentage having trained (or in the process of training) as a yoga teacher. Of the home practitioners, 69% (n=9/13) were also teachers. Nine participants (23.7%) were yoga teachers with a home practice, a specific group worth further analysis (to follow).

But first, teacher status and home practice were each explored versus practice tenure (years), yoga dose (hours), and meditation weekly frequency in the following table:

Table 8

Teacher status and home practice versus practice component data

ALL Participants (n=38)	Teacher (n=13; 34.2%) Mean±SD	Non-Teacher (n=25; 65.8%) Mean±SD	Plus Home Practice (n=13; 34.2%) Mean±SD	Minus Home Practice (n=25; 65.8%) Mean±SD
Yoga Tenure (years)	6.2±3.4	5.4±3.4	6.4±3.7	5.3±3.3
Yoga Dose (hours)	4.7±2.3	4.5±3.2	5.2±3.8	4.2±2.4
Med Freq (weekly)	2.9±2.4	2.5±3.0	4.4±2.8	1.8±2.3

The mean yoga practice tenure results showed a slight increase of 0.8 to 1.0-year for those participants with a positive teacher or home practice status. Similarly, for weekly yoga dose, a small positive mean increase equated to teacher or home practice status. Participants were asked to record their personal practice dose, i.e. not including classes taught. The similar dosage for teachers and non-teachers suggests that participants were compliant with this request. Participants with a home practice recorded one additional hour of yoga ‘dose’ per week, at 5.2±3.8-hours versus 4.2±2.4-hours for those without a home practice. Participants with a home practice had a mean weekly meditation

frequency that was more than double those who did not practice at home, at 4.4 ± 2.8 versus 1.8 ± 2.3 times per week. In contrast, teacher status had little impact, with a weekly frequency of 2.5 ± 3.0 to 2.9 ± 2.4 times per week for non-teachers and teachers, respectively.

4.2.2.3 Practice components in comparative groups

The nine participants (23.7%) who were teachers with a home practice — the ‘home+teacher’ group — were compared to their opposite counterparts — the ‘non-home+non-teacher’ group — who made up more than half of all participants (55.3%; $n=21/38$) to explore any trends in the data. The following table shows yoga tenure (years), yoga dose (hours), and meditation weekly frequency for the two comparative groups.

Table 9

Practice component data for comparative groups

Comparative Groups	home+teacher (n=9) Mean±SD	non-home+non-teacher (n=21) Mean±SD
Yoga Tenure (years)	7.2 ± 3.4	5.6 ± 3.4
Yoga Dose (hours)	4.7 ± 2.0	4.1 ± 2.2
Med Freq (weekly)	3.8 ± 2.3	1.9 ± 2.5

The comparative data shows that yoga dose (and the data spread) was similar for both the home+teacher and non-home+non-teacher groups. Yoga tenure for the home+teacher group was only slightly higher, by just over 1.5-years, with both groups falling within a mid-tenure range of 4 to 8-years. The home+teacher group recorded double the weekly frequency of meditation sessions at 3.8 ± 2.28 versus 1.9 ± 2.47 sessions per week for the non-home+non-teacher group.

4.2.2.4 Survey responses: Practice and diet/physical activity

Two of the online survey questions were specifically aimed at canvassing whether participants considered their yoga practice as a support for pro-health habits. The questions that simply offered three possible responses (Yes, No, or Not sure/Don't know) were:

- Do you feel that your yoga supports you to be active in other ways?
- Does your yoga practice support you in your dietary choices?

If participants responded in the affirmative, then a follow-up open-ended question asked: 'If Yes, how does your yoga practice support you to be active in other ways / support you in your dietary choices?' These open-ended responses were coded using IPA and are thus captured in Section 4.3. However, the initial closed questions listed above did provide an overview of the percentage of participants who responded positively regarding yoga's influence on their diet and physical activity (aside from yoga). Participants' were conclusive with respect to yoga supporting other exercise modalities, with all interviewees ($n=8/8$) and 90% ($n=27/30$) of the survey cohort agreeing that yoga supported them to be active 'off the mat', i.e. 92.1% ($n=35/38$) of all participants. Yet the survey data on additional exercise was too varied to gauge any trends related to participants' practices. A fuller response may have been gained if the online survey had offered a multi-response option to capture different modalities of exercise, rather than an open-ended comment field. While a range of modalities were noted, including walking, running, cycling, and swimming, the majority of responses referred to more generic physical gains from practice, i.e. strength, flexibility, feeling physically prepared and/or having more energy resources for other exercise, which were captured within the physical activity theme (section 4.3.4.3). Even within small-scale studies, experiential data can provide lived examples of yoga influencing other modes of movement (Cox et al., 2021).

Diet however was inconclusive, with over a third of participants ($n=14/38$) responding with a negative or unsure response; 25% ($n=2/8$) of the interview cohort and 31.6% ($n=12/38$) of the survey cohort. Of the participants who responded negatively, the majority ($n=5/14$; 35.7%) had a tenure of more than 10-years, versus just two (14.3%) with the lowest tenure of six to 12-months. Practice frequency did not show a pattern, e.g. of those participants ($n=14$) who did not feel that yoga supported them in their dietary choices, weekly frequencies ranged from one to over seven times per week (mean frequency of

3.9). Whether tenure influenced the experience of those participants who felt that yoga was a support for their physical activity and/or diet will be a question explored in the Discussion.

4.2.2 Online Survey: Outcome measures

The health habits data identified that smoking was not a prominent behaviour within the participant group. Only two participants identified as smokers (≥ 1 cigarette daily), both interviewees with a practice tenure of more than 10-years (male aged 56-65; female aged 26-35). Three participants (7.9%) had the highest alcohol intake (at ≥ 4 drinks per week). The two smokers recorded an alcohol intake of two to four drinks per week, with a further 14 from the survey cohort registering the same intake ($n=16/38$; 42.1%). Seven participants did not drink at all ($n=7/38$; 18.4%), with almost a third of participants ($n=12/38$; 31.6%) not drinking in the prior week, resulting in a total of 50% of participants not recently partaking in alcohol. Sleep quality was consistently high for participants, with a mean score of 4.68, where 5 equates to feeling rested upon waking *all of the time*. The lowest sleep quality score was 2 (from a zero to 5 scale) for just three participants (7.8%; females) who all had a low practice tenure (up to 2-years). Age and employment status did not appear to be a factor regarding poor sleep quality, with the three participants in their late twenties, thirties, and fifties, and all in paid employment.

Testing for normality, the only data that significantly ($p>.05$) deviated from a normal distribution (Shapiro-Wilk Test) arose from the nutrition self-efficacy scale (SES). The specific practice components that deviated from normal in relation to nutrition SES were: a practice tenure of 1.5 to 2-years ($n=7/38$; 18.4%); a weekly yoga dose of 180-mins (or 3-hours) ($n=6$; 15.8%); a weekly meditation frequency of once per week ($n=9$; 23.7%); and being a non-teacher without a home practice ($n=9$; 23.7%). The deviation from normal for the nutrition SES findings is likely a consequence of inter-participant variability¹⁴⁹, evidenced by a larger standard deviation of 0.74 (versus 0.05 for the exercise SES).

Given that the majority of the data were normally distributed, the below table (Table 10) shows the mean $\pm$ SD for both the self-efficacy and interoceptive awareness (MAIA)

¹⁴⁹ Interparticipant variability may have been a consequence of the questions within the nutrition SES, which appeared more complex than those for the exercise SES. For example, responding to how one feels about sustaining a diet 'even if I have to rethink my entire way of nutrition', versus exercising 'when I have worries and problems' (Mehling et al., 2012).

scales. To reiterate, the SES for nutrition and physical exercise have been shown to correlate significantly to health behaviour (Fukuoka & Itoh, 1984); whilst interoceptive awareness is a measure of participants' subjective experience of being embodied. Scaled responses for the SES were converted to a numerical certainty score of 1 to 4, with 1 being *very uncertain*, and 4 equating to *very certain*; whilst the MAIA score had a numerical range of zero to 5, with zero equating to the questionnaire statement *never* applying to the participant's life, and 5 equating to *always* applying. The findings show an almost identical mean for both scales across all participants, at 3.47 for nutrition and 3.44 for exercise. Participants therefore self-reported a high degree of self-efficacy, being *rather/very certain* that they could sustain both a healthful diet and exercise, irrespective of challenges.

Table 10

Outcome measures: Self-efficacy (SES) and interoceptive awareness (MAIA)

ALL Participants		
(n=38)	Min - Max	Mean±SD
NutritionSES	0.0 - 4.0	3.5±0.7
ExerciseSES	2.2 - 4.0	3.4±0.5
NoticingMAIA	2.3 - 5.0	4.0±0.7
EmotAwareMAIA	3.0 - 5.0	4.3±0.5
BodyListenMAIA	0.0 - 5.0	3.4±1.0

Again, to provide context to the numerical results, both of the self-efficacy scales asked participants the same question: How certain are you that you could overcome the following barriers? (Schwarzer & Renner, 2018). A maximum result of 4.0 for the SES scales equates to '*very certain*', versus a zero score of '*very uncertain*'. For the MAIA, participants scored from zero to 5.0 in response to awareness statements such as: 'I listen for information from my body about my emotional state' (Mehling, 2012). A score of zero equates to '*never*', i.e. disagreement with the statement; whilst a score of 5 meant that

participants 'a/ways' experienced the interoceptive state referred to in the MAIA statement.

Nutrition SES scores were similar regardless of tenure, as can be seen in the visual box plot (Figure 1, on the following page) illustrating the data spread (SD) of SES scores versus yoga tenure. Mean self-efficacy scores were almost identical for nutrition and exercise — 3.47 ± 0.74 for nutrition versus 3.44 ± 0.46 — with the pattern of scores sitting primarily within the 3 to 4 range, indicating that participants consistently recorded a positive self-efficacy, albeit this consistency may be in part the result of repetition in survey completion. The MAIA items surveyed across participants (noticing, emotional awareness, and body listening) are also presented visually (Figure 2), with the widest SD (1.03) noticeable for body listening. The fact that the data can be skewed by just two participants from the survey cohort¹⁵⁰ is indicative of the limits of statistical analysis with inter-participant variations within small samples. With this in mind, if one puts aside the skewed item (body listening), the visual for MAIA versus tenure does show a general trend of increased interoceptive awareness scores after 1.5-years of practice. As such, it could reasonably be speculated that body listening would likely have followed suit without the skewed data.

The IPAQ-SF data collated participants' exertion levels in the week prior to their survey, ranging from vigorous to moderate to walking to sitting. The IPAQ-SF questions provide examples of exertional activities, such as heaving lifting, digging, aerobics, or fast cycling as vigorous activities; and asked how many days (of the past seven) that participants undertook activities such as walking for a minimum of 10-minutes (The IPAQ Group, 2002). The means and standard deviations for the IPAQ-SF data according to cohort (interview and survey) are provided in Table 11. What stands out is that the IPAQ-SF results for both cohorts are similar. The scores differ by less than one hour for three of the exertional categories. The walking category differed by 1.2-hours, but that only equates to an average of 10.6-mins extra walking per day for the survey cohort. The sample size does not allow for generalisations, but one point of difference that stood out within the interview cohort (n=8) was a higher level of vigorous activity in those with a longer practice tenure

¹⁵⁰ The first (tenure >8-years; female non-teacher) self-reported an average of just 0.33 from the three body listening questions (rated 1, 0, and 0). Whilst the second, a female teacher from the mid-tenure group, scored zero across all body listening questions.

Figure 1

Participant (average) SES scores versus yoga tenure

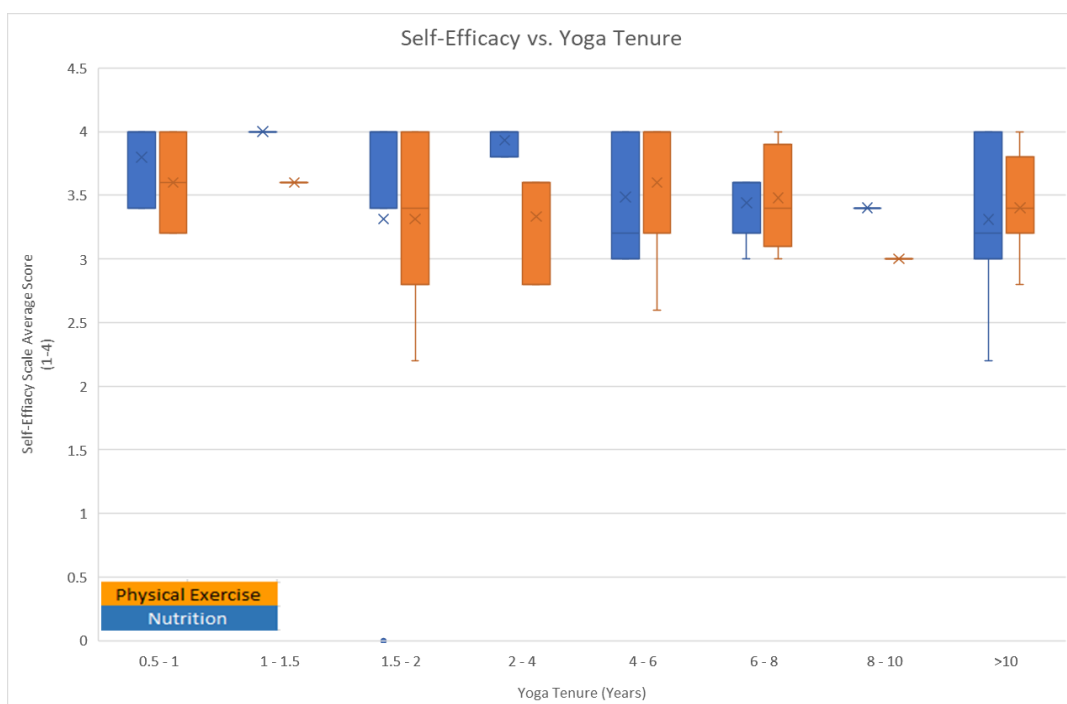
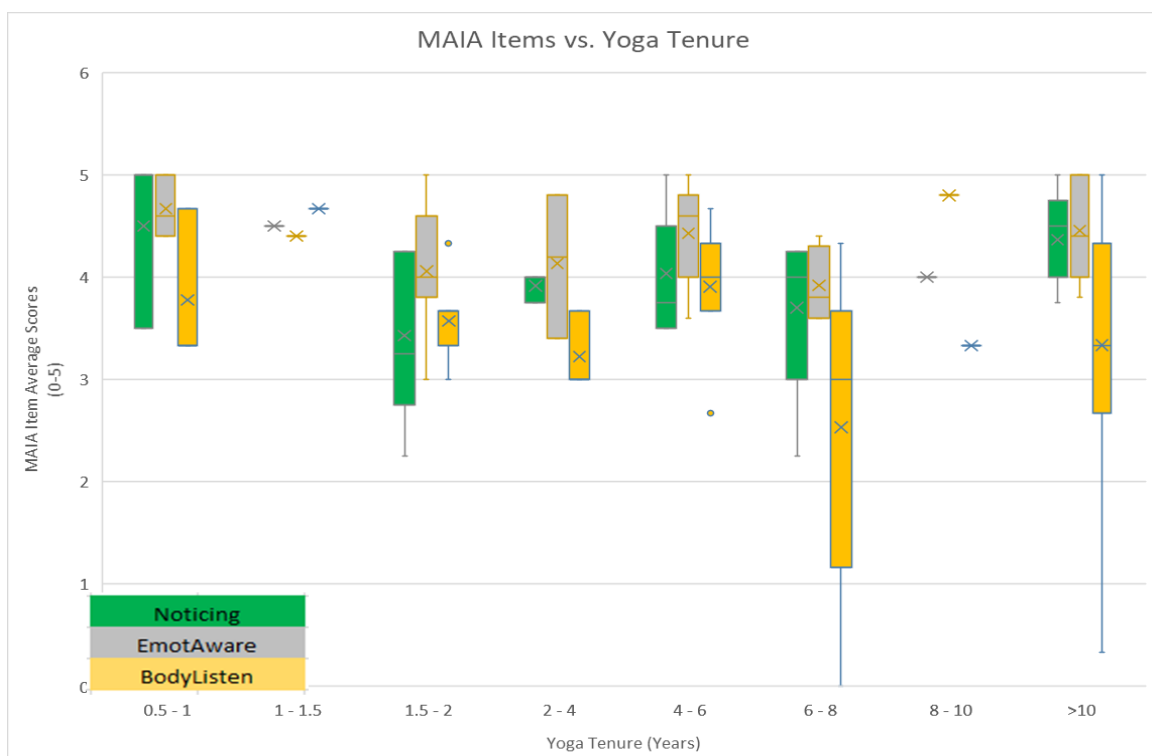


Figure 2

Participant (average) MAIA scores versus yoga tenure



(>10-years)¹⁵¹. The topic of additional exercise (other than yoga) is included within the qualitative data (see 4.3.4.3).

Table 11

Outcome measure: Physical activity (IPAQ-SF) by cohort

Activity Hours/Week	INTERVIEW Cohort (n=8)	SURVEY Cohort (n=30)
	Mean±SD	Mean±SD
Vigorous	1.5±3.5	1.4±1.6
Moderate	3.9±4.4	3.0±3.7
Walking	3.4±3.2	4.7±4.0
Sitting	19.4±6.8	18.9±10.6

Over 80% of participants were either in paid employment or self-employed, which may explain the fairly consistent mean sitting hours across participants, though data were not collated regarding the sedentariness of participants' work. Overall, the only identifying feature of the IPAQ-SF weekly activity data was an increase in vigorous activity in the higher tenure interviewees versus their lower tenure counterparts, which one could surmise may be due to improved fitness levels with yoga tenure enabling more intensive exercise.

4.2.3 Outcome measures in comparative groups

As for the yoga practice component data, a comparison of the 'home+teacher' group, i.e. teachers with a home practice, versus the 'non-home+non-teacher' group was replicated for the outcome measures data (see Table 12). The highest SD was 1.06 for

¹⁵¹The high tenure (n=4; tenure >10-years) interviewees reported a mean of 3±4.76-hours vigorous activity versus 0.01±0.03-hours for their low-tenure counterparts (n=4; tenure ≤ 2-years), which is a 300-fold difference, due to the fact that three quarters of the low tenure group reported no vigorous activity.

body listening in the 'non-home+non-teacher' group. As discussed earlier, one of the outlier data points from the survey cohort is the likely consequence of the larger SD for body listening in the non-home+non-teacher group, i.e. skewing the data. For the remaining measures, the home+teacher group scored slightly higher than their counterparts. Though if one were to round up the data points the outcome scores would differ by one point for self-efficacy (nutrition and exercise), i.e. the home+teacher group would be *very certain* (a score of 4) they could overcome barriers to eating 'healthful foods' or honour their 'exercise intentions' (Fukuoka & Itoh, 1984) versus the non-home+non-teacher group being *rather certain* (a score of 3).

Table 12

Self-efficacy (SES) and interoceptive awareness (MAIA) for comparative groups

Comparative Groups	home+teacher (n=9)	non-home+non- teacher (n=21)
	Mean±SD	Mean±SD
NutritionSES	3.5±0.6	3.4±0.9
ExerciseSES	3.7±0.3	3.3±0.5
NoticingMAIA	4.2±0.6	4.0±0.7
EmotAwareMAIA	4.3±0.7	4.3±0.5
BodyListenMAIA	3.7±0.7	3.4±1.1

4.2.4 Correlations: Practice components and outcome measures

The following two tables (13 and 14) present the findings for practice tenure versus a home practice, and practice tenure versus teacher status. To restate, approximately one third (34.2%) of the participants reported a home practice. The greatest number of participants with a home practice (n=6) had a practice tenure of more than 10-years. Yet, of all participants with the highest practice tenure (>10-years), it was almost split 50:50 between those with or without a home practice (54.5% and 45.5% respectively). For a tenure of four to six years, results were similar for those with (n=3) or without (n=4) a home practice. Similarly for teacher status, this was most prevalent in participants with the

longest practice tenure (>10-years), though yet again the split for participants with a practice tenure over 10-years was almost 50:50 (45.5% teachers versus 54.5% non-teachers). Over a third of participants identifying as teachers were in the tenure range from 18-months to 6-years. Whilst a low practice tenure (n=4; 0.5 to 1.5-years) was indicative of participants who had not trained as teachers.

Table 13

Yoga tenure and home practice

Yoga Tenure (years)	Plus Home Practice Count (%)	Minus Home Practice Count (%)	Total (100%) Count
0.5 - 1	1 (33%)	2 (66.7%)	3
1 - 1.5	0	1 (100%)	1
1.5 - 2	2 (28.6%)	5 (71.4%)	7
2 - 4	1 (33.3%)	2 (66.7%)	3
4 - 6	3 (42.9%)	4 (57.1%)	7
6 - 8	0	5 (100%)	5
8 - 10	0	1 (100%)	1
>10	6 (54.5%)	5 (45.5%)	11
Total	13 (34.2%)	25 (65.8%)	38

Table 14

Yoga tenure and teacher status

Yoga Tenure (years)	Teacher Count (%)	Non-Teacher Count (%)	Total (100%) Count
0.5 - 1	0	3 (100%)	3
1 - 1.5	0	1 (100%)	1
1.5 - 2	3 (42.9%)	4 (57.1%)	7
2 - 4	1 (33.3%)	2 (66.7%)	3
4 - 6	3 (42.9%)	4 (57.1%)	7
6 - 8	1 (20.0%)	4 (80.0%)	5
8 - 10	0	1 (100%)	1
>10	5 (45.5%)	6 (54.5%)	11
Total	13 (34.2%)	25 (65.8%)	38

Another point of interest is the identification of significant associations presented in the Pearsons correlation matrices below (Table 15 and 16). The first matrix considers any interrelationship between the outcome measures, and the second matrix presents correlations between participants' practice component data and outcome measure results (SES and MAIA). Nutrition and exercise self-efficacy were positively correlated ($r=.58$; $p<.001$). Significant positive correlations were also found between the emotional awareness items on the MAIA and both noticing ($r=.50$; $p=.001$) and body listening ($r=.53$; $p<.001$), suggestive of the interrelationship between interoceptive aptitudes. An interesting finding was a significant positive correlation between noticing and both self-efficacy scales (nutrition $r=.47$; $p=.003$; exercise $r=.43$; $p=.007$).

Table 15

Pearson correlation matrix (Pearson r values)

	Nutrition SES	Exercise SES	Noticing MAIA	EmotAware MAIA	BodyListen MAIA
Nutrition SES	1				
Exercise SES	.58**	1			
Noticing MAIA	.47**	.43**	1		
EmotAware MAIA	.04	-.02	.50**	1	
BodyListen MAIA	.02	-.04	.20	.53**	1

**** Correlation is significant at the .01 level (2-tailed)**

SES: self-efficacy scales (nutrition and exercise); MAI: interoceptive awareness items (noticing, emotional awareness, and body listening).

Table 16*Pearson correlation matrix (Pearson r values with confidence intervals)*

	Yoga Tenure	Yoga Dose	Med Freq	Home Practice	Teacher Status
NutritionSES	-.16 (-.46 – .17)	.04 (-.28 – .36)	.10 (-.23 – .41)	.01 (-.31 – .033)	-.16 (-.46 – .17)
ExerciseSES	-.05 (-.36 – .28)	.21 (-.12 – .50)	.13 (-.20 – .43)	.23 (-.52 – .09)	-.53** (-.72 – .25)
NoticingMAIA	.25 (-.07 – .53)	.14 (-.19 – .44)	.12 (-.21 – .42)	-.09 (-.40 – .24)	-.11 (-.42 – .22)
EmotAwareMAIA	.12 (-.21 – .42)	.02 (-.30 – .34)	.23 (-.10 – .51)	-.05 (-.36 – .28)	-.03 (-.34 – .30)
BodyListenMAIA	-.19 (-.48 – .13)	.27 (-.05 – .55)	.25 (-.08 – .53)	-.14 (-.44 – .19)	.04 (-.29 – .35)

** Correlation is significant at the .01 level (2-tailed)

SES: self-efficacy scales (nutrition and exercise); MAI: interoceptive awareness items (noticing, emotional awareness, and body listening).

Only two of the practice components were significant correlated, with teacher status negatively correlated to exercise self-efficacy ($r = -.53, p < .001$). Thus for the study participants, those who identified as yoga teachers were less confident in their ability to sustain exercise, i.e. any movement modality, not just yoga. Whilst at first glance one may assume that those trained in a movement modality would have an increased confidence in their ability to move, the data is pointing towards the participants experiencing a negative impact of their teaching role.

4.3 Qualitative Data

This section will primarily focus on analytical depth, via IPA. However, in order to provide a broad perspective from which to survey the participant narrative, thematic analysis — informed by the theme frequency spread — will consider whether a narrative between and across cohorts is visible. The table below collates the frequency count from all participant survey responses (n=38) and interviewee transcripts (n=8). These cohort theme frequencies will also be presented for each category and its associated themes within the IPA section that follows, along with a visual presentation of each category's themes (Figures 3 to 6). Interviewees have been assigned pseudonyms in order to provide the opportunity to consider unique perspectives or inter-participant subjectivity while retaining anonymity.

4.3.1 *Thematic Analysis: Theme frequencies and patterns*

As noted, the IPA section to follow will provide a complete description of each category and theme that emerged from the qualitative data. The qualitative data — interview transcripts (n=8) and open-ended survey responses (n=38, i.e. all participants) — is presented as four main categories, within which the findings are captured as 13 themes and eight subthemes. The process of categorisation was refined via three stages of analysis, to both consolidate key themes into a category that adequately captured the themes within it, and to ensure that categories remained “rooted in the data” (Colley, 2010, p. 188). Given that the interview cohort provided the richest substrate from which to draw from, the data categories are presented (in Table 17) in order of theme frequency from the interview cohort (n=8), which incorporates both transcript and survey data. Thus whilst the frequency count from the survey cohort may be higher, due to the larger cohort size (n=30), the numbering of categories is dictated by the depth of the qualitative data. As noted in the Methods chapter, frequency counts confirm the validity of thematic categories, rather than being a measure of influence. These frequencies offer a wider viewpoint from which to observe any between or cross-cohort patterns within the qualitative dataset.

Table 17*Categories and Themes: Frequency Count by Cohort*

FREQUENCY COUNT	Interview Cohort n=8 Total Source: Survey/Interview	Survey Cohort n=30 Total Source: Survey
Category 1: Impact	169 (total category count)	236
Theme 1: 'Off the mat'	*65	*33
Theme 2: Mind-body	63	130
Theme 3: Self-awareness	27	28
Theme 4: Balance	14	45
Category 2: Health behaviour	72	71
Theme 5: Adherence	23	23
Theme 6: Diet	18	16
Theme 7: Physical activity	3	13
Theme 8: Yoga applied	28	19
Category 3: Practice	57	34
Theme 9: Progression	25	10
Theme 10: Community	21	19
Theme 11: Access	11	5
Category 4: Internal landscape	41	16
Theme 12: Embodiment	25	7
Theme 13: Presence	16	9

**Indicates that the theme was coded for the full cohort*

If we refer back to the practice component data presented in section 4.2, the key parameters (in no particular order) were teacher status, practice tenure, and a home and/or meditation practice. A search for these components within the qualitative coded items provides a different entry point into participant responses (survey and interviews). For example, meditation only gets a single explicit mention in reference to progression of practice (progression theme; practice category), whereby one interviewee (Evelyn; tenure >10-years; teacher) considered her future practice and envisaged a greater emphasis on meditation. Although, from a wider angle the entire fourth category (internal landscape) considers the meditative aspects of practice, from breathwork to attention. As one survey respondent noted (subtheme attention; presence theme), the practice

provided space for a quiet and contemplative focus (Case#38; tenure >10-years). Looking at the data from the context of meditative experiences, albeit from just two participants, highlights the fact that the explicit references to the meditative elements of a practice were both in long-term adherents to yoga.

Similarly, a home practice was only mentioned within two themes, both within the practice category. Within the community theme, Cleo (tenure 18-months to 2-years) shared that she lacked the motivation to practice at home, preferring to be in a different space. While a survey respondent (Case#25; tenure >10-years) within the access theme felt that a virtual platform had facilitated her home practice beyond a weekly in-studio practice. As such, these two examples illustrate a comparative perspective: one preferring the community experience away from home; the other developing a home practice via access to a virtual class experience.

Given that RQ1¹⁵² was framed around an 'off the mat' experience, an overview of practice tenure and teacher status of the selected (n=30) participant exemplar quotes¹⁵³ for the OTM theme shows that just 3 (10%) were from participants with a tenure of 6-months to 1-year, and a third (n=10) had a tenure up to 2-years. Nine examples (30%) had been practicing for more than 10-years, whilst only five examples (16.7%) were from participants who identified as teachers. Following the same process for the adherence theme — in reference to RQ2¹⁵⁴ — the selected examples definitively show that tenure features most prominently, while teacher status does not. Out of the 33 coded examples, just 3 (9.1%) had a tenure of 6-months to 1-year, with a total of 6 (18.2%) examples from participants with a tenure up to 2-years. As such, almost 82% of examples emerged from a practice tenure >2-years, with 14 (42.4%) from those with a tenure of >10-years. In contrast, only 5 (15.2%) of the 33 examples were from teachers. From this perspective, an increase in practice tenure correlated to both the 'off the mat' and adherence themes, with the adherence theme showing the strongest link.

¹⁵² **RQ1:** How has a movement practice (yoga) impacted practitioners' lives 'off the mat'?

¹⁵³ The exemplar quotes do not equate to 33 different participants. Some participants commented on adherence more than once, particularly those who were interviewed.

¹⁵⁴ **RQ2:** Is there a relationship between adherence to a yoga practice and pro-health habits?

4.3.2 IPA Analysis: Categories and themes

Engaging with the data with an open and curious stance allows for flexibility in approaching data beyond the confines of the question that the narrative responded to. As Braun and Clarke (2022) assert, one's "analytic orientation can shift from ... experiential to ... critical ... [to] offer multiple interpretative 'takes' on the data." (p. 205). Maintaining an open and flexible viewpoint when considering question responses enabled the coding of themes to capture the nuance of participants' shared experiences, which did not necessarily equate to the context of the question. An example of the participants expanding beyond the confines of a survey question, can be seen by a comparison of the survey cohort's responses to the question: 'What motivated you to start yoga?' More direct responses commented on initial motivators, such: as feeling stiff, or having digestion and sleep issues (physical motivators); and feeling anxious or wanting to seek relief from distraction (mental motivators). However, other responses described reasons why participants adhered to their practice, e.g. due to the experience of the 'meditation side' of practice, or feeling grounded by the consistency of practice.

To ensure that the "presence of the participants" (p. 356) is at the forefront, verbatim quotes are used to honour the participants' subjective experience of each theme¹⁵⁵, and placed front and centre¹⁵⁶ within the text to emphasise the centrality of this experiential data. Exemplar responses from the full dataset (interview and survey cohorts) ensure representation from all participants, with the addition of a category profile (Figures 3 to 6) to illustrate diagrammatically theme frequency and coding (Briegel-Jones et al., 2013). To add a further dimension to Briegel-Jones et al.'s (2013) so-called 'pen profiles', a diagrammatic representation (using a pie chart) clearly illustrates the proportion of each theme (based on the interviewee's theme frequencies) to the respective category.

Practice tenure and teacher status¹⁵⁷ are noted alongside quotes and/or responses to inform the discussion. As noted prior, Appendix E provides an exemplar table of all coded data sources (metadata) for the interview cohort, both verbatim quotes from interview transcripts and online survey responses. The number of exemplar quotes per interviewee provides insight into the spread of the interview data informing the thematic

¹⁵⁵ Where participants have used Sanskrit terms, spelling and italics has been formatted by the researcher to maintain consistency.

¹⁵⁶ Indented quotes are an exception to the APA-7 format, in order to stay true to the centrality of the participant narrative in the qualitative analysis.

¹⁵⁷ Only those participants who identify as teachers have their status noted alongside their practice tenure.

codes. The following list of quotes per interviewee includes tenure (in years), teacher status (T) and length of interview (mins) in brackets:

- Amy 14 quotes Tenure 0.5-1 (53-mins)
- Liam 10 Tenure 0.5-1 (48-mins)
- Gwen 24 Tenure 1.5-2 (72-mins)
- Cleo 16 Tenure 1.5-2 (60-mins)
- James 8 Tenure >10 (28-mins)
- Marsha 19 Tenure >10 (36-mins)
- Libby 14 Tenure >10, T (44-mins)
- Evelyn 18 Tenure >10, T (25-mins)

The range of quotes from the low versus high tenure interviewees is similar: 10 to 24 for a tenure of ≤ 2 -years, and eight to 19 for a tenure of >10 -years, confirming that the coded items represent a range of yoga experiences. The largest number of exemplar quotes came from a relatively new practitioner (Gwen with a practice tenure of 1.5 to 2-years), though the interview with Gwen was the longest and thus did provide more data to draw from. The least number of quotes (eight) were from a long-term practitioner (James with a practice tenure of >10 -years).

The interview duration alone did not correlate to depth of data, as evidenced by Evelyn (the shortest interview) providing 18 quotes (above the average of 16 for all interviewees). The researcher aimed for an interview duration of 45-mins, but the priority was capturing responses to all of the questions. While the two male interviewees had the least number of exemplar quotes, the sample is too small to assign any gender difference (e.g. whether a male interviewer may have elicited additional content to code). Other time commitments and/or a personal preference regarding both the use of a video-conferencing platform, and a sense of rapport with the researcher, are all confounding factors additional to gender.

To highlight the participant voice, findings are presented as they arose, i.e. verbatim quotes, with commentary added either to paraphrase for clarity or consider alternate explanations regarding participant comments. Having categorised the data, the

researcher ideally steps back to allow the data to speak directly to the reader. The category and thematic framework simply provide a structure from which to navigate participant narratives, to facilitate understanding of the participants' experiences, and how each theme captures the experiential data. The names assigned to the themes are, without question, a construct borne out of the researcher's own narrative. That being said, the themes themselves are less important than the actual grouping of coded items. As Rodham et al. (2015) noted, in their paper considering the process of a shared analysis, gaining consensus on the content of a theme takes priority over an assigned name.

Coded items supporting each theme, i.e. verbatim quotes and survey responses, are presented as fragments from one or several participants in order to, as van Manen (2014) suggests, "underscore the multiple meaning aspects of a phenomenon from multiple and variant perspectives." (p. 390) Or, in other words, provide examples of inter and intra-participant experiences. The composite fragments offer a glimpse into the patterns that the themes represent, even where those patterns may be contradictory in nature (Braun & Clarke, 2022). Interpretation of these experiences — the hermeneutical lens that seeks to "make sense of the reality captured in the data" (Braun & Clarke, 2022, p. 160) — will be explored in the Discussion chapter.

4.3.3 Category 1: Impact

On the other side of class is my real self.

The defining feature of the first category is that all coded data represents participants' experience of the impact or influence of their practice, or in other words the experiential downstream or flow-on effects of a practice on practitioners' lives. As such, the impact category relates to RQ1, which asked how a yoga practice had impacted practitioners' lives off-the mat? A total of 169 coded items emerged from the interview cohort data, and the survey cohort frequency count was 236. All coded items were assigned to a single theme, which on occasion required careful consideration, given that for a small number of items participant comments referred directly to two themes. As noted in the Methods chapter, when these dual-theme concepts occurred, the final coding decision was based

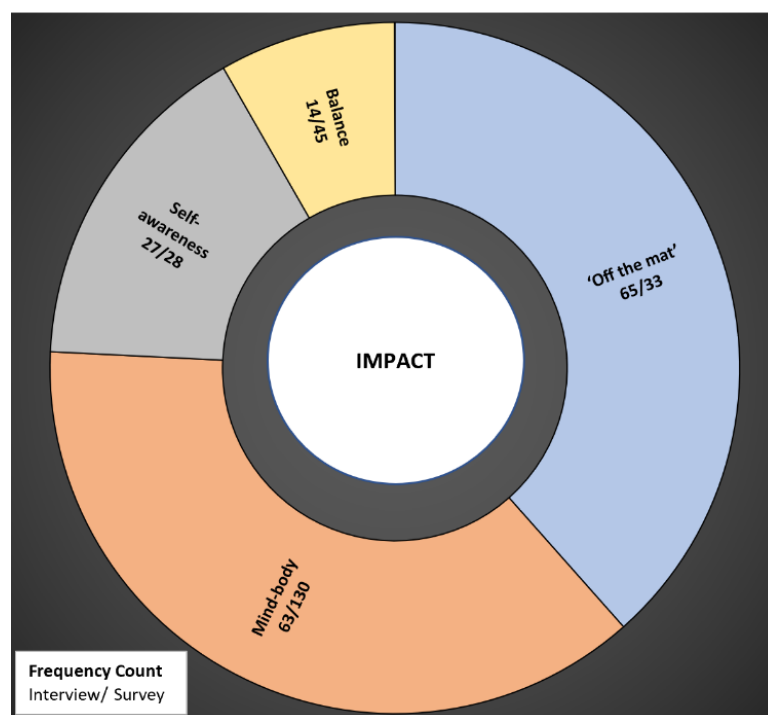
on capturing the full meaning, or essence, of the participant's response. One such example being a comment that yoga supported a mindset that was both "calmer and more balanced" (Marsha Survey; tenure >10-years), and as such could have been coded within two impact themes, namely balance and calm mind (a subtheme of mind-body). Yet the survey response went on to clarify a more balanced approach by adding "I am more positive and less negative", and thus balance was felt the best fit over calm mind.

Given the focus of RQ1 was reflected in the survey and semi-structured interview questions, it is unsurprising that yoga's influence provided the highest theme frequency. As per the categories, themes are presented in frequency order. As noted, the survey cohort data also features as exemplar responses, and is fully captured by theme frequency for each category profile (Figures 3 to 6). The impact category contained four major themes. Initially items were coded as 'perspective' whereby participants described a change in viewpoint or mindset as a result of their practice, but given that the perspective was experienced 'off the mat', a choice was made to have a single all-encompassing 'off the mat' (OTM) theme to best represent the influences of a yoga practice on participants' lives. Mind-body, self-awareness, and balance complete the impact themes.

Before describing each impact theme and their respective coded items, it is worth noting that items emerged from several survey questions posed, including those that did not directly ask participants to share their thoughts on yoga's effects. To clarify with an example, both the question 'What does a yoga practice mean to you?' and 'What motivated you to start yoga?' resulted in coding within the impact category, illustrating the subjectivity, yet often similarity, of participants' responses to the same question. The coded findings that follow are represented simply as themes — without specific reference to the questions posed — in order to capture the nuance of participants' self-reflections that are not limited to, but rather traverse across, discrete questions.

Figure 3

Theme frequencies for the impact category



Proportional representation indicative of interview cohort.

4.3.3.1 Theme 1: 'Off the mat' (OTM)

The OTM theme collates all data that describes the influence of yoga on participants' lives, including any change of perspective or mindset shift. The OTM theme frequency was 65 for the interview cohort (n=8) and 33 across the survey cohort (n=30). The OTM theme does relate to the yoga applied theme (within the health behaviour category). However items that were coded as OTM captured participants' experiences of yoga's influence on their lives, i.e. the direction of action was yoga impacting their lives, without the conscious action of participants. This is in contrast to the yoga applied theme, whereby practitioners used strategies or tools (learned through practice) in their day-to-day life, thereby the direction of action arose from the participants themselves. For clarity, coded items that are excluded from this theme include explicit reference to the application of strategies or tools learned through yoga, or comments on yoga supporting health behaviour or lifestyle; both of which have been coded within the health behaviour category, under the themes of yoga applied, diet, and physical activity (see Section 4.3.4).

As the coding framework was refined, two narratives emerged in reference to (i) an approach to life whereby yoga had changed the filter or lens through which participants viewed life, i.e. a change in perspective gained through yoga, or a 'yogic perspective'; and (ii) an influence of yoga on life events, whereby yoga informed or guided interactions with the outside world. Thus two subthemes of perspective and influence collate their respective coded items.

4.3.3.1.1 Subtheme 1a: Perspective

Participants spoke of a perceived effect of yoga with succinct but overarching comments such as this eloquent description of yoga being a filter through which to view life:

[Yoga] provides the platform from which I regard the rest of my life. It was kind of 2D in the past, ... and I feel like it's got more shape and colour, ... more 3D now. (Gwen Interview; tenure 18-months to 2-years)

The use of yoga as a lens, or filter, through which to observe and/or move through life was a dominant concept within the perspective subtheme. In particular, the idea of 'letting go' or accepting elements outside of one's control, such as:

I was fighting things more than embracing ... yoga teaches me to let go ... (Amy Survey; tenure 6 to 12-months).

Yoga helped me deal with a lot of things I was holding onto (sic), it has helped me to let go and to be able to move forward. (Case#35; tenure 18-months to 2-years; teacher)

There is a solution to most things; if not, then it just is. (Evelyn Survey; tenure >10-years; teacher)

I am able to live in acceptance and rarely react negatively to anything that goes "wrong". (Case#17; tenure 4 to 6-years)

...helps me focus within and to accept things just the way they are. (Case#18; tenure 6 to 8-years; teacher)

Acceptance – particularly of where by body is today. ... the ability to physically relax in nearly every situation¹⁵⁸. (Case#11; tenure 6 to 8-years)

¹⁵⁸ Physical relaxation in response to challenge could be coded as yoga applied (health behaviour category), but in this instance the preceding sentence around acceptance leant itself more to a context of letting go of trying to control challenge through relaxation.

To accept where my body is in this moment, on this day, which may be different to any other day. (Case#25; tenure >10-years; teacher)

A more short-term shift in perspective post-yoga surfaced from within the survey cohort; a prime example being:

... I never ever think after a yoga practice 'I wish I hadn't done that'. I always feel better in some way. It can change your perspective of the day completely." (Case#21; tenure 18-months to 2-years)

Yoga was the practice I fell back on to relieve my stress and help me cope ... (Case#25; tenure >10-years).

While other comments encompassed a longer term perspective:

Yoga helps me face myself ... I have more hope for my future wellbeing because of yoga. (Liam Survey; tenure 6 to 12-months)

It has softened my expectations of myself and others and realised what I am now is enough which is ultimately really freeing. (Case#8; tenure 4 to 6-years; teacher)

Another common thread was the experience of a different frame of mind:

... I think yoga has enabled me to maintain a relaxed, non-judgmental, non-aggressive approach to stressful situations. (Evelyn Survey; tenure >10-years; teacher)

I have noticed that if I do not practice yoga for more than two or three days in a row, I tend to feel more anxious and less tolerant. (Libby Survey; tenure >10-years; teacher)

It has taught me that I can do anything so long as I manage myself well ... and remain humble. (Evelyn Survey; tenure >10-years; teacher)

Of note, the first two of the above quotes were initially coded as response, i.e. responding without judgment, or feeling less tolerant without a regular practice, both of which are indicative of a degree of self-awareness and thus crossover with another of the impact themes. Theme fluidity being an illustration of the subjectivity of qualitative analysis.

The data also provided examples of participants who experienced a perspective shift in the absence of any expectations of their practice. One such example from the survey cohort:

Having no expectations, yoga has changed myself and how I interact with the world. (Case#6; tenure 12 to 18-months)

4.3.3.1.2 Subtheme 1b: Influence

A simple expression of a yogic perspective influencing daily life was offered by Gwen, who stated that yoga was “helping ... to put life into perspective” (Interview; tenure 18-months to 2-years). Whilst one of the survey cohort was reminded of the yogic lens when facing challenges:

I now often remember in trying times at work or in personal relationships that I know there's a better way (a more 'yogic' way). (Case#26; tenure 4 to 6-years)

Similarly, another survey response spoke to the influence of one's “internal space ... on one's view of the outward world.” (Case#37; tenure 8 to 10-years)

A clear example of yoga's downstream influence 'off the mat' is:

... you might be a little bit stressed out with modern living and ... a lot of things you worry about you can't help anyway. So just to let them go and ... they have gone after the [yoga] session. (James Interview; tenure >10-years)

In a similar vein, an increased self-efficacy with regards to coping with life after yoga was a common experience amongst participants. As Cleo shared:

I just cope with life a lot better. ... I just feel more capable of what I can do, because of what I've done in [the yoga room]. (Interview; tenure 18-months to 2-years)

Indeed, confirmation of yoga facilitating coping with life's challenges was shared in Marsha's survey in response to the question of whether yoga supported them in their life:

I feel supported by my practice because I know that whatever life throws at me, ... yoga ... will help calm, focus and re-energise me. (Survey; tenure >10-years)

Further reiterated by a survey participant:

... my whole family benefit from my time on the mat as I ... better manage life's demands. (Case#34; tenure 2 to 4-years)

Knowing this potential positive downstream or flow-on effect of practice, experienced as a supportive framework from which to engage with life, may well encourage adherence. Interestingly, for one participant it was the motivation to start a yoga practice:

Being able to better manage life and relationships. (Case#20; tenure >10-years)

A similar, but more detailed narrative emerged from a survey participant, who discussed yoga's influence beyond "a body experience", and elaborated by adding:

Yoga has spread over to the health of my personal relationships and also my financial health. (Case#3; tenure 2 to 4-years; teacher).

An additional influential context within the data referenced how yoga had provided a spiritual dimension to participants' lives. One participant explained that yoga had offered more than he had been able to gain from going to the gym:

... it's brought that spiritual side ... giving me something else ... that that kind of physical program at the gym wasn't ... really giving me ... (Liam Interview; tenure 6 to 12-months).

Another had only just started to appreciate this aspect of yoga after more than six years of practice, admitting that she "didn't really get the mental/spiritual stuff but more recently it is starting to fall into place." (Case#10; tenure 6 to 8-years) Gwen shared her reconnection "with something that's beyond how I think I am", and deduced that the consistency of practice over time was the reason for a "more reliable and more accessible" sense of "grounding" and for the fact that she could "detach more". This detachment was expanded on:

So it's given me [an] orientation that I can detach from my particular inner dialogue and ... my sense of identification with ... drawing towards things and strong aversion. ... "[Yoga] allows me to surf my life. So it gives me a sense of freedom. (Interview; tenure 18-months to 2-years)

One of the survey cohort defined the "spiritual dimension" of yoga as "integrating all of these (*sic*) facets of the human person in a simple, practical, and fairly accessible way", suggesting that the practical outcome is being brought "back to what is important" (Case#19; tenure 6 to 8-years). Another simply stated that yoga "accords spiritual benefits such as more patience, [and] calmness ..." (Case#26; tenure 4 to 6-years).

4.3.3.2 Theme 2: Mind-body

The downstream experiential effects of yoga on the mind and body is the second theme within the impact category, with a theme frequency of 63 and 130 for the interview and survey cohorts, respectively. This wide-ranging theme intersects with others, but the primary remit for coding within this category was identifying responses that referenced the experience of yoga's influence on mind and/or body.

Liam, who was new to the practice (tenure 6 to 12-months), felt that yoga had improved his resilience, both mentally and physically, and the quality of his breathing. In addition, while there was a sense that yoga was creating systemic change, he did not yet fully comprehend the extent of the change:

I also feel yoga is helping me holistically in ways I don't yet fully understand or appreciate. (Survey)

Contrasting experiences of the impact of practice on mind and body included a sense of "a deeper relaxation ... [or] Inner relaxation" (Gwen Interview; tenure 18-months to 2-years) versus an increased energy level:

... if I missed practice, I just feel lazy and lethargic. [After yoga] I feel like I can just do more. I've got more energy. (Libby Interview; tenure >10-years; teacher)

This contrast was expressed by Marsha who enjoyed both the physicality of practice and how it influenced her mental/emotional state:

... my preference is to be really physical with my yoga ... [and] I've really noticed ... how good it is for my mind and my mindset and my mood. (Interview; tenure >10-years)

Adding that:

I really notice the internal difference when I have missed practice for more than a few days. (Survey; tenure >10-years)

A more concise response to a survey question apropos any unexpected effects of practice summed it up as "Gives fitness and mental skills." (James Survey; tenure >10-years) Three survey participants noted that a yoga class could shift mental state. This was expressed by one as "whatever mood" was being experienced before class "will be different by the time I finish." (Case#27; tenure >10-years; teacher) Similarly, the second

termed yoga “a pattern interrupt”, to explain the influence of yoga to positively “shift a mindset” (Case#3; tenure 2 to 4-years; teacher). While the third noted:

When I feel low, or overwhelmed, I know that I can go to my mat and feel restored after a yoga session. (Case#25; tenure >10-years)

Adding that practice was a time “to honour my physical and mental state at the time.” A further example of yoga’s effect on mental state referred to depression, affirming a “Significant impact in ... supporting recovery from depression” and that the practice had “Offset stresses of work and depression.” (Case#37; tenure 8 to 10-years) Whereas an end-of-the-day reset was described by another in response to why they practiced when they don’t feel like it:

Because even if I have had a tough day at work, I know that once I'm on the mat and ready to go, I will feel on top of the world¹⁵⁹ (Case#9; 18-months to 2-years).

The question of practicing irrespective of one’s lack of an urge to do so, does feed into the reasons why participants adhere to their practice. As such, this question will be explored further within the health behaviour category.

Others focused on the physical aspects, such as “Good flexibility, better posture, deeper breathing, a bit more stamina” (Case#2; tenure 4 to 6-years). Another participant used yoga as an accompaniment to running:

... using different muscle groups I felt stretched and came away invigorated. (Case#3; tenure 2 to 4-years; teacher)

While a long-term practitioner emphasised yoga as “Exercise, to de-stress and have a sweatout (*sic*).” Adding that the influences of practice on physical health were “general strength ... improvement [in] suppleness, [and] detoxes the system.” (Case#7; tenure >10-years) Four more survey participants provided clear illustrations of the physical outcomes. The first stating that: “any aches and pains ... that I had before class, seem to ease or disappear altogether”; and commenting on prevention of injury, whereby “Yoga keeps my core strong and thus protects my back from another injury”. Plus yoga had resulted in a positive effect that transferred to their “chosen sport” by facilitating “the strength and flexibility that it requires.” (Case#25; tenure >10-years) The second example highlighted yoga’s preventative influence such that the participant had “avoided back

¹⁵⁹ This item could be coded as adherence (health behaviour category), but this example highlighted the post-yoga feeling and thus was selected for its mind-body influence.

surgery, unlike many in my family”, and the practice had enabled them “to endure and recover from a significant health condition with fewer physical problems than experienced by others” (Case#27: tenure >10-years; teacher). This experience of yoga supporting recovery was matched by another response asserting that yoga “has helped me recover from injuries and childbirth better than if I had done nothing” (Case#38; tenure >10-years). Finally, the fourth response focused on “a net reduction in general body aches and pains”, going on to explain that “Without yoga practice I start to develop chronic low-level pain in my joints and body.” (Case#32; tenure 4 to 6-years; teacher).

A summation of the combined mind-body effects arising from practice was offered in the following response:

Yoga practice for me is more than just moving through the physical āsanās (although it used to be when I first started). It is now more about the mind and body working together and a time for me to take a break from everyday life, breath, re-focus, and create a sense of calmness and control. And the physical workout is a bonus. (Case#10; tenure 6 to 8-years)

This experience of a change in emphasis of practice over time, from purely physical to more holistic, did feature elsewhere within the data. For example:

I originally got into yoga for reasons of physical exercise, a form where I enjoyed the challenge of strength and stretch. But I soon found it was supplying me with something else. If I don't get to practice yoga regularly ... I ... miss it physically ... [and] mentally. (Case#15; tenure 6 to 8-years)

4.3.3.2.1 Subtheme 2a: Calm mind

A specific sub-theme within the mind-body theme was coded as calm mind and warrants a distinct code due to the fact that all of the interviewees noted this downstream effect of yoga, plus a further 83.3% (n=25/30) of the survey respondent cohort. Participants highlighted a range of experiences equating to a calm state of mind, such as a sense of the mind emptying, or slowing down, during practice; a clearer mind post-practice, “less captivated by thoughts (for a period)” (Gwen Survey; tenure 18-months to 2-years), i.e. with the caveat that this effect dissipated; and overall a calming influence, with one participant wryly noting:

...when you're having a bad day or week ..., and your husband says to you, 'Oh, I think you need to go to yoga'! ... you know that mentally it helps you. (Evelyn Interview; tenure >10-years; teacher)

This reflection suggests that the practice offers a soothing balm for the mind, and a downstream effect noticeable to family/friends. This calming influence was further clarified by other participants:

I have a very active mind ... without my yoga I cannot slow down. ... I find yoga is the time when I just (pauses) stop and can just re-ground myself. ... I really do notice the difference. (Marsha Interview; tenure >10-years)

[After yoga] ... often I feel more calm and clear headed. (Case#32; tenure 4 to 6-years; teacher)

I find that when I don't do yoga regularly my mind can struggle to slow down and my thoughts can be more fractured. (Case#38; tenure >10-years)

... it helps you turn down the constant background noise in your head. (Case#33; tenure >10-years; teacher)

I haven't found anything else that is so good at "clearing out my head" and calming me. ... I can't ruminate while doing it ... (Case#26; 4 to 6-years).

In response to the question "What does a yoga practice mean to you?", a survey participant placed a calm mind as the central feature:

Connection of mind, body, spirit. To calm the mind and nerves. To find stillness and clarity in class and carry this out of class. (Case#6; tenure 12 to 18-months)

While another summed up yoga's influence as relieving a state of "rushing woman syndrome!" The practice was a grounding influence that "enhances [one's] nature to be peaceful and calm." (Case#36; tenure 18-months to 2-years; teacher) An impact supported by two further survey responses: one described feeling less stressed, and feeling "more calm and collected, even being away from the mat"¹⁶⁰ (Case#1; tenure 18-months to 2-years; teacher); the other simply stated that yoga helped "manage stress and create a feeling of calm when challenged" (Case#7; tenure >10-years).

¹⁶⁰ Another example of theme fluidity, as the OTM theme could fit this survey response. The coding decision in this instance was guided by the sentence topic being: "I used to stress a lot." For each instance where coded items could cross more than one theme, the best fit was aligned to the interpretation of the full response, i.e. the context.

4.3.3.3 Theme 3: Self-awareness

The theme frequency for self-awareness was 27 for the interviewees and 28 for the survey-only participants. The self-awareness theme closely relates to a yogic perspective whereby one is aware of the influence of yoga in gauging a response to internal and external environments. This is clearly evidenced by one of the interview cohort commenting on “a quicker recovery from reactivity and negative mind states”, adding that:

[they] can be more flexible and make better choices ... [in response to situations]. (Gwen Survey; tenure 18-months to 2-years)

An experience reiterated by a second interviewee, Martha, who suggested that yoga enabled a moment of pause or reflection between stimulus and response:

Everything I do is probably more considered now ... I think yoga is helping me to pause a bit more so ... Less reaction and more considered ... (Interview; tenure >10-years).

Note that even with a practice of more than 10-years, the ‘practice’ of yoga ‘off the mat’ in this respect was still an active process, not a defined end-point. The participant clarified this process of the pause as one of:

[Being] “so much more in myself ... more conscious of when I make a decision or when I do something.” (Marsha Interview; tenure >10-years)

Three participants from the survey cohort also conveyed their use of a pause before responding. The first in the context of anger, sharing that “yoga has helped me learn to pause, relax, wait before a response.” (Case#2; tenure 4 to 6-years); the second using the pause to allow an emotional or feeling state to shift, adding that “any state is temporary and like clouds, everything passes” (Case#3; tenure 2 to 4-years; teacher); and the third in the context of familial relationships, whereby yoga provided “the ability to find space and therefore be less reactive as a parent and partner.” (Case#8; tenure 4 to 6-years; teacher) Two more from this cohort provided answers that suggested a pause, while not explicitly stating it: one explained that yoga had taught her to give herself “space and compassion, and find [her] own way through difficult times.” (Case#27; tenure >10-years; teacher); whilst another noted a reduction in reactivity and a calmer manner, with yoga providing the “opportunity to practice mindfulness” (Case#7; tenure >10-years), suggestive of an awareness of this approach to life situations.

A sense of being in oneself, and having an awareness of that, was also clearly expressed (by the same participant) as "... yoga just helps me get back to me." This being-ness links to embodiment, a theme to follow within the internal landscape category. Similar, and equally apt, expressions voiced a feeling of being at home in oneself:

... I know once I have completed a class I will have come home to me. On the other side of class is my real self. (Case#37; tenure 8 to 10-years)

[Yoga] has shown me how to be at one with myself ... (Case#28; tenure 4 to 6-years).

While growing more into herself was shared by Cleo via the experience of emotion regulation:

Once I found yoga I found a part of me I never knew, and it helped me grow. I have gained more confidence and have more stable moods and no longer feel the need to take [medication]. (Survey)

Another survey participant summarised the effect of yoga on their sense of wellbeing or mental/emotional health as feeling "better at being" and a "better relationship with myself and those around me", adding that she felt "More alive." (Case#33: tenure >10-years; teacher) In addition, awareness of working through emotions was captured by a survey response:

It has enabled me to feel emotions more complex than I had previously dealt with. ... It helped me feel what was necessary to move through my feeling into a better emotional space. (Case#31; tenure 4 to 6-years; teacher)

And one of the interviewees (Gwen) asserted that yoga was a means to 'train' self-awareness:

I see it as a tool/an opportunity to strengthen my awareness of experience that is less identified with my personal self. (Survey; tenure 18-months to 2-years)

Being aware of how one reacted to stress was a common example, such as having an ability to respond with a less anxious and more thoughtful response, or maintaining a more equanimous state:

I think yoga has enabled me to maintain a relaxed, non-judgmental, non-aggressive approach to stressful situations. (Evelyn Survey; tenure >10-years; teacher)

Other survey respondents provided an answer that emphasised an awareness of being present or mindful:

I have quite a stressful job and long days. My yoga practice has taught me to be more mindful - to just deal with what I have right here and right now. (Case#15; tenure 6 to 8-years)

I'm a reactive personality and I can use deep breathing as a form of self-soothing. (Case#3; tenure 2 to 4-years; teacher)

I have changed my outlook on life. I live for now rather than planning years in advance and I try not to dwell on the past. (Case#21; tenure 18-months to 2-years)

With regards to my mental yoga practice, this also has an impact in everything else I do. I don't dissociate my mindfulness practice from my everyday life. (Case#33; tenure >10-years; teacher)

I'm more mindful in everyday practices including eating. (Case#36; tenure 18-months to 2-years; teacher)

Just to note, the third response (above) was initially coded as perspective, i.e. a changed outlook. But on consideration of the second sentence (of the response) it is clear that the participant is aware of a change from a future-focused towards a present moment mindset, and thus the awareness of a perspective shift is the more prominent feature. This shift towards being present was matched by a survey participant:

I started [yoga] thinking that it was only for physical exercise, but it has helped with my emotional and mental state too as I can be present without always thinking about the past and the future all the time. (Case#1; tenure 18-months to 2-years; teacher)

To add to the idea of changing how one responds to life, Liam expressed an awareness of dissatisfaction arising from yoga — the only participant to mention this result —and explained that it was “one of the earlier impacts”, going on to clarify that:

... now if I'm dissatisfied with something, or ... somebody or some situation, I'm more likely to, to speak up about it or find a way of, of dealing with it. (Interview; tenure 6 to 12-months)

In fact the self-awareness of being dissatisfied led towards a calmer state, because of an increased confidence in considering the future and “how I can potentially influence my future”. In other words, an increased sense of agency through “finding the courage and wisdom to act or not act”. A similar reference to self-agency — expressed as feeling unfazed — follows within the yoga applied theme.

A more personal expression of self-awareness was shared by Amy who had started yoga within the past year:

Vulnerability ... is what ... yoga means to me. Because without allowing myself to feel vulnerable, I will never be able to open [to] what's really deep inside me. (Interview; tenure 6 to 12-months)

This explanation was expanded further by revealing that “the vulnerability allows my body to be free”, suggesting that the yoga itself enabled a freeing of held “tension” within the body, whether physical or emotional. This release is supported by another participant from the interview cohort stating that “the movement [yoga] has helped me to deal with past trauma” (Cleo Survey; tenure 18-months to 2-years); and by a survey participant who acknowledged that “a practice will bring up ... frustration or anger or tiredness or relief”, creating the opportunity “to reflect in and listen to”, adding that yoga could “bring to the fore something you are not always consciously aware of, but that definitely needs addressing.” (Case#8; tenure 4 to 6-years; teacher) Another subjective example of increased self-awareness amidst depression was provided by a survey response:

I suffer (sic) from depression for years and this helps me to feel emotions in my body and let them manifest so I can feel them and accept them and not ignore them. This helps me feel depressed for shorter periods of time. (Case#2; tenure 4 to 6-years)

Through metaphor, one survey participant defined awareness as “like living beyond the veil”:

{Yoga} has made me more aware of myself and life around me ... I have become aware of the Armour we can use in life ... more of an awakening into how we present ourselves. (Case#3: tenure 2 to 4-years; teacher)

4.3.3.4 Theme 4: Balance

Given that balance was a term that featured across the full dataset, it was felt appropriate to highlight this concept as a distinct impact theme. Again, balance is a good illustration of the fluidity of the themes and categories. Having the ability to self-regulate internally, particularly with respect to emotional regulation, fits well with a concept of balance, and the calmness discussed above could be aligned to a balanced state of mind. Balance was an experience noted by participants after a yoga practice, such as feeling “balanced in body and emotions” (Evelyn Survey; tenure >10-years; teacher). Balance appeared on 14 occasions within the interview cohort, and 45 times for the survey cohort. A number of comments made explicit reference to ‘balance’, e.g. finding balance through yoga to compensate for a sedentary occupation, seeking balance versus other physical

activity such as martial arts, or a “feeling of being more in balance” (Gwen Interview; tenure 18-months to 2-years). One survey participant explained that yoga helped to stabilise his mood, so that he could function better out in the world (Case#32; tenure 4 to 6-years; teacher).

With regard to the ebb and flow of life, two of the interview cohort felt that yoga balanced out their lifestyles in contrasting ways. One to balance out sedentariness: “... I spend a lot of time sitting. So I think yoga gives a nice balance ... (Libby Interview; tenure >10-years; teacher); and the other to counter busyness: “I do often have a lot on my plate, so I feel like having yoga does really balance my lifestyle out. ... my lifestyle’s very yang, and the yoga helps bring some yin ...” (Marsha Interview; tenure >10-years). A survey participant also remarked on the benefit of yoga with respect to counteracting a sedentary lifestyle, i.e. balancing the body with movement:

It helps me stretch and strengthen my body in opposite or extended ways than how I use my body in my daily life so I don't end up hunched over and in pain. (Case#38; tenure >10-years)

In contrast, another used yoga “to complement other exercise” (Case#7; tenure >10-years), i.e. to provide a balance of movement. A feeling matched by the following comments:

I see the combination of yoga and ... other activities [cycling and walking] as providing a great balance. (Case#14; 2 to 4-years)

... my body was getting too stressed ... from excessive exercise and yoga provided me with a form of exercise that was calming for my body. (Case#17; tenure 4 to 6-years)

The below examples further illuminate how balance was experienced by the participants. The first three quotes reference mental balance:

[Experiencing] ... a much calmer and more balanced mindset. (Marsha Survey; tenure >10-years)

I am more balanced mentally. I struggle with overthinking and anxious thoughts. Yoga has helped me with this. (Case#21; 18-months to 2-years)

I think overall when I practice regularly I find more stability in my sense of wellbeing and emotional health, with reduced "peaks and valleys" in mood. (Case#32; tenure 4 to 6-years; teacher)

Note the balancing influence on mood, i.e. less ups and downs. The following three examples talk to an overall balance in mind-body and/or life:

Centred and balanced, both physically and emotionally. (Case#6; tenure 12 to 18-months)

To me yoga practice is a balance of body and mind. ... If I don't get to practise yoga regularly, I don't (sic) only miss it physically, I miss it mentally. (Case#15; tenure 6 to 8-years)

[A yoga practice is] A time and place where I can bring some balance back into my life. ... I find that I get 'reset' after a yoga class, particularly as I often only manage one class a week on Sunday evening. This class allows me to decompress after the week and reset for the week ahead. (Case#34; tenure 2 to 4-years)

Again the 'reset' appears, as discussed earlier under the mind-body theme; another fluid concept that fits with balance and mind-body. Yet another survey participant shared that a yoga session is "like I hit a re-set button that gives me energy for the rest of my week." (Case#26; tenure 4 to 6-years) While an energetic balance post-practice was offered by responses to the survey question: ' How do you feel after a session on your mat?'

Usually calm and energised. There's a really fine line between feeling energised and tired ... (Case#1; 18-months to 2-years; teacher).

Completely knackered, relaxed, in balance and unable to worry about anything. (Case#37; tenure 8 to 10-years)

The mention of a "fine line" in the first comment is indicative of the participant self-regulating during practice to prevent fatigue, particularly given that the response was in reference to "a tough power vinyasa class" which can be a strenuous form of yoga including fast-paced transitions.

Finally, a sensitivity to imbalance developed through yoga was mentioned by two participants from both cohorts:

... my system is more sensitive to when ... deviating off-track" (Gwen Interview; tenure 18-months to 2-years).

Yoga helps me sense when I am losing balance in life, and gives me tools to restore it. (Case#27; tenure >10-years; teacher)

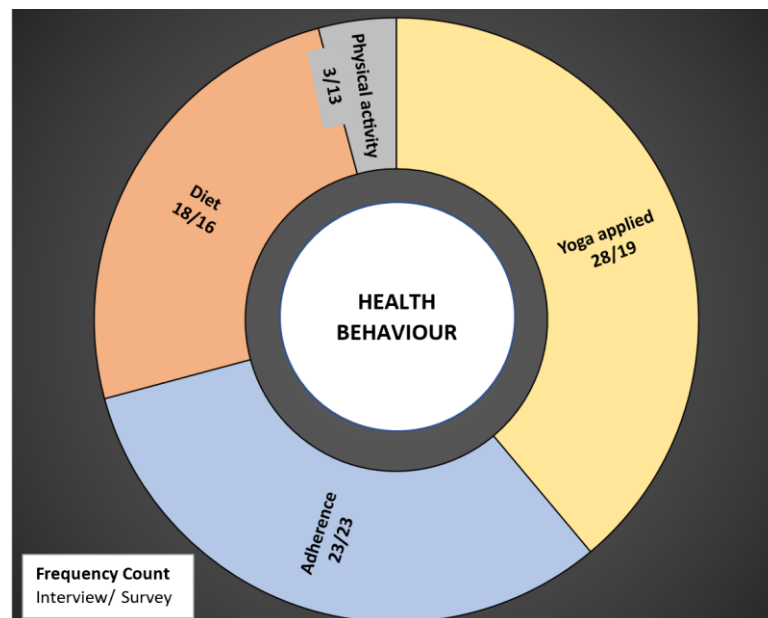
4.3.4 Category 2: Health behaviour

A day that starts with yoga is generally a day that gets off on a better foot ...

Given that the study recruited participants willing to discuss how yoga impacted their lives, the fact that health behaviour was the second largest category from the interview cohort with a total frequency count of 72 coded items was expected. A count all but matched by the survey cohort who totalled 71 items. Four themes emerged within this category. The first theme of adherence captured strategies that facilitate an habitual yoga practice. The diet and physical activity themes captured examples of yoga influencing the adoption of, or a shift in, diet and exercise behaviours in participants. The final theme, yoga applied, refers to coded items identifying the application of learned strategies or tools, e.g. breathwork in response to external stressors.

Figure 4

Theme frequencies for the health behaviour category



Proportional representation indicative of interview cohort.

4.3.4.1 Theme 5: Adherence

Items coded as adherence refer to participant narratives that highlighted habitual strategies used to support practice adherence, including motivations to practice even when participants don't feel like it. The interview cohort totalled 23 references to this theme, a theme frequency matched by the survey cohort. In fact, responses to the question of why participants practiced yoga when they didn't feel like it provided a glimpse into the subjective influence of yoga motivating participants to get on their mat. A common thread, was the knowledge that yoga would provide a positive shift (as discussed in the mind-body theme), or put simply:

Because I know I'll feel better afterwards. (Case#7; tenure >10-years)

I may simply meditate, or practice a restorative pose. But I will feel better for taking time for myself. (Case#27; tenure >10-years; teacher)

This knowledge illustrated by two participants with more than a decade of yoga experience. A feeling reiterated by another high tenure participant, Libby, who stated:

Feel like it or not, I never regret going to a yoga class, or practicing at home, but I always regret not practicing. (Survey; tenure >10-years; teacher)

And equally from Amy, with less than a year of practice:

[I practice] When I am tired, ... I know that it will benefit me after class, and I know it's my state of mind. (Survey; tenure 6 to 12-months)

A disciplined perspective on practice featured in the comments. Evelyn regarded her adherence to practice as a responsibility not to be shirked:

Sometimes we don't like what life presents us or we don't like waking up in the middle of the night to a young child. Should we just say no thanks? Same thing with practice ... (Survey; tenure >10-years; teacher).

Though she did allow for a break from practice if necessary, e.g. if "too tired or sick"; suggestive of self-regulation and/or body awareness. Equally a survey participant self-regulated her practice in line with her health, also referring to monitoring self-talk that may negatively impact her adherence:

If I feel unwell I don't practice, but if it's just me head then I try really hard to go. (Case#11; tenure 6 to 8-years)

In a similar vein, practice adherence was portrayed as “a discipline” by one of the survey cohort (Case#17; tenure 18-months to 2-years), and a disciplined approach was reflected on by another survey respondent with the opinion that: “Not feeling like it is not really an option for copping out.” (Case#26; tenure 4 to 6-years) A teacher amid the survey cohort clarified their commitment “to a regular practice” as predicated on a desire to teach from authenticity, adding :

Thus I force myself to go practice even when my energy is very low or I don't feel physically good (but not when I am sick). (Case#32; tenure 4 to 6-years; teacher)

While Evelyn expanded on her dedication to her practice:

I wouldn't like to see myself lose the practice ... I think I've always been quite determined to do it and dedicated. ... I think you need to put in your best effort. (Interview; tenure >10-years; teacher)

Another survey participant in response to the question ‘In what ways do you feel supported by your yoga practice, in your life in general?’, shared that yoga helped her “keep a little bit of discipline in [her] life on a regular basis.” Case#23; tenure >10-years; teacher)

A different narrative within the dataset was an adherence to practice informed by the knowledge of how participants would feel post-yoga, or from a desire to access specific benefits, i.e. the results of their practice. To illustrate this idea from the survey cohort:

... I know how good I feel after a practice and knowing that pushes me to always come back to the mat. (Case#1; tenure 18-months to 2-years; teacher)

Sometimes I make myself go as I know it will make me feel better. (Case#10; tenure 6 to 8-years)

These are the times when I need to practice the most. ... I have felt depressed and tired and I haven't gone to a class and I ended up feeling worse. Whereas the times where I do go I feel so much better for it. (Case#16; tenure 6 to 12-months)

Because I know my body needs it even if my mind is reluctant. In the end, the body knows what it needs and I shouldn't let my mind get in the way of that. (Case#25; tenure >10-years)

... you prioritize your yoga practice and don't miss it (without very good reason) because it accords spiritual benefits such as more patience, calmness, stamina etc. (Case#26; tenure 4 to 6-years)

Because I generally feel like it will give me insight into something else I may not want to look at. Plus generally always makes me feel better! (Case#8; tenure 4 to 6-years; teacher)

Note the last example includes accessing self-insight or awareness through the practice as a motivator, alongside a positive state shift. One participant shared that she appreciated it when a teacher acknowledged “to the room of frazzled people that getting in the door and on the mat is an achievement”, augmenting her explanation with:

I know I'll feel better when I get there and getting there is a big deal when you feel hesitant or lazy or stressed out or in a rush. (Case#19; tenure 6 to 8-years)

In terms of behaviours or habits that support adherence, a key concept was preparing for practice the night before, so that the choice had already been made. As one survey participant explained:

I pretty much never feel like exercising ... But I make myself go to yoga because I know I will enjoy it while I'm there and I will feel great when I finish. ...I don't let my mind debate whether I will go or not. I decide the night before when I will go then I just get dressed and get there and there's no turning back at that point. (Case#2; tenure 4 to 6-years)

What stands out from this example, is the fact that the participant doesn't let their mind talk them out of practicing, adding that sustaining the benefits (from practice) that they had already gained was a motivating factor. This preparation was matched by an interviewee who shared their routine to support attending class:

I do tend to have planned the night before ... I have my clothes set out as a routine, and I have my alarm set. ... I just go. (Libby Interview; tenure >10-years; teacher)

Another pro-health behaviour was setting up a commitment to meet a friend at class to support adherence, but an additional motivator was “rarely regretting making the effort to get to a class, even when I didn't feel like going.” (Case#14; tenure 2 to 4-years) One participant purposefully drove friends to an early morning class “to keep up the momentum”, adding that it then “becomes an obligation ... not a choice!” (Case#18; tenure 6 to 8-years; teacher). This just demonstrates how creative adherence strategies can be. Another was motivated by the fact that she had limited time available to go to class and “get time to myself”, thus:

... if I don't do it I waste that opportunity so I feel I have to take the chance to do it when I can. (Case#38; >10-years)

An ability to notice patterns that could derail participants' habitual practice emerged from the dataset, pointing towards the experience of a positive influence from yoga, particularly in shifting out of a negative physical or emotional state. While this influential shift was discussed in the mind-body theme, the following examples speak to participants using their own prior experience of this influence to support practice adherence:

Sometimes I feel lazy, unmotivated, but this is the time I actually need the practice most. (Case#6; tenure 12 to 18-months)

I certainly feel good afterwards ... if ... I think, 'I'll stay in bed this morning', well I don't let myself do that ... (Libby Interview; tenure >10-years; teacher).

If I feel unwell I don't practice but if it's just [in] my head then I try really hard to go. (Case#11; tenure 6 to 8-years)

Because when I don't like it, that feels like the time I need to go to get the benefits of slowing down and reducing my busy mind. (Case#34; 2 to 4-years tenure)

This last example clearly shows a self-awareness whereby the participant has a self-knowledge that a discomfort regarding practicing is not a reason to forgo a class, but rather a sign that yoga would be a positive choice, given her experience.

Not surprisingly, prioritising yoga featured within the data in relation to sustaining a practice, as in the following examples from interviewees with at least 6-years practice tenure. Hinting at a habitual behaviour, James compared yoga to brushing his teeth, noting that:

I'm a regular practitioner ... it is part, and important part of my lifestyle. Not the be-all or end-all but ... It's just like brushing your teeth. ... I'm glad I got into it and ... I'm glad I'm keeping it up." (Interview; tenure >10-years)

His emphasis on yoga being part of — yet not the epicentre — of life, was similarly expressed by a survey participant who had “worked towards making [yoga] a focus ... But I also aim to make [work] a priority too”. Yoga, in this context, facilitated a balanced lifestyle:

... it brings me back to what is important and how to aim for balance. (Case#19; tenure; 6 to 8 years)

The automaticity of practice was clearly expressed by Libby who laughed as she said, “I just kind of do it. It’s just become part of what I do.” Elaborating further with respect to habit:

It’s like saying ... ‘Why do you get out of bed?’ ... it’s become part of my lifestyle. (Interview; tenure >10-years; teacher)

As noted prior, a desire to not lose gains made through practice, was a motivator to adhere and practice regularly, even daily:

... if I don’t do yoga every day, I can see my body starts tensing up ... (Amy Interview; tenure 6 to 12-months).

If I miss ... four days or something ... you notice it when you first go back, so I find it’s best to do it regularly. (James Interview; tenure >10-years)

Finally, scheduling yoga early ensured practice was not forgotten and, as a bonus, felt like a positive initiation to the day:

... for me, the best way to incorporate yoga is to do it first thing ... Because that means I’ve done it ... I feel like it sets me up for the day. (Marsha Interview; tenure >10-years)

...often I do first thing in the morning ... no more than 20 minutes, half an hour ... a nice start to the day for me. (James Interview; tenure >10-years)

The two health behaviour themes to follow specifically address diet and physical activity strategies that practitioners have adhered to, and — in response to RQ2¹⁶¹ — ascribe to their yoga practice.

4.3.4.2 Theme 6: Diet

Most interviewees (7 of 8) noted that yoga had supported or stimulated changes in their diet, with a theme frequency of 18. The survey cohort had 16 responses coded as

¹⁶¹ A reminder of RQ2: Is there a relationship between adherence to a yoga practice and pro-health habits?

diet. A common participant experience was being kind or taking better care of their health as a result of an increased connection or sense of embodiment. Other reasons for dietary choices flipped the equation around, in that their diet was supporting their practice, such as not wanting to feel heavy, thus demonstrating a positive feedback loop between yoga and diet. Evelyn (tenure >10-years; teacher) provided examples for both of these scenarios:

[Yoga has] changed the way I've eaten, that's for sure ... you are definitely more conscious about what you put into your body ... (Interview).

... practicing yoga regularly ensures that I eat food that is not too heavy or stimulating. I need to be light in my practice and can't have my stomach digesting whilst doing my practice. (Survey)

A common thread was a desire to eat healthier, encapsulated by two concise responses from the survey cohort:

I feel good in my body. This helps me make good dietary choices. (Case#31; tenure 4 to 6-years; teacher)

... it doesn't feel right to eat poorly if I'm in a yoga mindset. (Case#34; tenure 2 to 4-years)

Further examples of dietary selection both supporting the practice and/or being motivated by the practice, included selecting food that would feel good before or after class; limiting alcohol intake the day prior; or eating less before practice:

I need to feel my best for class, otherwise I suffer, so that's a motivation [re diet]. (Cleo Survey; tenure 18-months to 2-years)

If going to class next day will limit alcohol consumption. Will consider carefully what I eat before I eat before a practice. (Case#8; tenure 4 to 6-years; teacher)

I am more aware of healthy eating choices and do not practice yoga with a full stomach. (Case#20; tenure >10-years)

I tend to eat more healthily before yoga (e.g. just a smoothie or fruit) ... (Case#26; tenure 4 to 6-years).

In the last example, the participant elaborated regarding the influence of lighter eating prior to class, noting that they had gone on to "experiment with having a smoothie for

lunch on days I don't do yoga" which had supported their "weight management". Yet another survey participant preferred to practice "on an empty stomach" in the morning, as this worked well for their dietary regimen of not eating until 11am¹⁶² (Case#17; tenure 4 to 6-years). A clear example of a regular practice supporting healthier food choices was shared by a teacher, who explained that when he takes a break from yoga his diet changes for the worse:

I have to keep a regular practice so I can't really eat shit food during the day or else I feel terrible practicing and teaching. Thus by default I have to stay hydrated and eat fairly healthy food. I find that this changes when I stop practicing - so I think one of the main benefits of regular yoga practice is the influence this has on your diet. (Case#32; tenure 4 to 6-years; teacher)

In terms of overall support for pro-health behaviour, Amy — in her first year of practice — spoke to changes to her diet, alcohol intake, and smoking; prefacing the change as a result of "taking care of, being kind to my body, being kind to myself:

...it has changed the way I cook ... I don't eat ... meat ... I'll bypass quite a few foods, and a lot of it's yoga ...

I used to smoke ... [at] work ... just to fit in [and] ... also to mask the stress ...

I used to drink a lot, but now ... I'm quite happy to just have a non-alcoholic [beverage] ... so it has changed me a lot in terms of my health. (Interview; tenure 6 to 12-months)

Regarding her shift in health status, the experience was one of feeling "more alive, ... more energetic" and "mentally more healthier (*sic*) than ... before". The survey cohort had also reduced their smoking and drinking, with the addition of either limiting or removing meat from their diet, such as:

I stopped smoking. I only drink socially. Where possible I'm Vegan. (Case#3; 2 to 4-years; teacher)

I try to ethically source food. I have stopped eating meat. I try to reduce dairy as much as possible. (Case#21; tenure 18-months to 2-years)

¹⁶² The participant was following an intermittent fasting protocol. An approach noted by a second survey respondent, who had adapted to this regimen in the past year (Case#37; tenure 8 to 10-years), i.e. after 9-years of practice.

I try to eat less meat and make more vegetarian choices, as well as eat more leafy vegetables and fruit. (Case#25; tenure >10-years)

Another interviewee within their first year of practice revealed a conscious choice to “eat better” and that yoga “helps me to think more about eating natural foods”, i.e. less processed. Interestingly his appetite had also changed:

I have also learnt through yoga that I can eat less and less often and still have good energy levels. (Liam Survey; tenure 6 to 12-months)

This conscious decision-making was matched by Marsha, who purposefully chose “to stick to a clean and truly sustaining diet” motivated by a desire for a body that was “strong, healthy and happy” (Survey; tenure >10-years). From the survey cohort, one participant experienced reduced “cravings ... when practising regularly (Case#8; tenure 4 to 6-years; teacher), while another thought yoga prompted them “to want to eat a balanced diet” (Case#9; tenure 18-months to 2-years).

It was noticeable that comments describing a considerable influence on diet originated from interviewees with the least practice tenure. As tenure increased, a process of dietary change was noted that could potentially relate to an increased embodiment or interoceptive awareness. Comments from those with a tenure of ≤ 2 -years included:

I think my relationship with food and alcohol ... is refining over time ... my system is more sensitive to when I'm deviating off-track. (Gwen Interview; tenure 18-months to 2-years)

Getting more aware of overeating and of effects of eating certain things – desire for moderation and feeling not full ... (Gwen Survey; tenure 18-months to 2-years)

I just felt more of how ... my mind and my body were more connected I think. ... there must be other ways [beyond yoga] to give it [the body] what you need. ... like learning how much water to drink, and what food to eat, and what foods make me feel more yuck after or before [class]. (Cleo Interview; tenure 18-months to 2-years)

I look after my body much better as yoga has helped me become more aware of my body and how to look after it. (Cleo Survey; tenure 18-months to 2-years)

A survey respondent with a tenure of 2 to 4-years noted:

I have become more aware of my body and how it works since I started yoga. ... Also I'm aware of the reactions of (sic) alcohol and sugar as those substances make my skin itch. (Case#3; teacher)

Whilst Libby, with a tenure of more than 10-years, shared:

I think yoga probably ... helps me to eat better ... you don't feel like big fatty meals or anything after ... practicing ... But I tend to like healthy food. (Libby Interview; teacher)

Cleo summed up the influence of her practice on pro-health habits with the following statement:

... yoga opened that door. ... Yeah, definitely the beginning of my journey to be more healthy. (Interview; tenure 18-months to 2-years)

4.3.4.3 Theme 7: Physical activity

Coded items for physical activity refer to any movement modality that is additional to a yoga practice. Any type of movement, not just that classed as exercise, fits the classification of physical activity, in line with the IPAQ-SF which incorporates physical tasks around the house and garden. This theme had a smaller frequency across both cohorts: with three mentions by the interviewees, and a frequency of 13 for the survey cohort. Yet the comments clearly show yoga having a flow-on effect to other movement modalities.

The dataset included comments related to physical outcomes from practice, such as feeling more energised or experiencing a sense of physical readiness:

I have more energy after yoga so am more likely to go for a walk. (Libby Survey; tenure >10-years; teacher)

I feel I have more energy to do my activities during the day. (Case#1; tenure 18-months to 2-years; teacher)

[Yoga] increases my overall energy level so I feel more inclined to do other activities. (Case#32; tenure 4 to 6-years; teacher)

My body is stronger, so I feel more able to use my body in other ways. (Cleo Survey; tenure 18-months to 2-years)

Another narrative captured thoughts that discussed how yoga facilitated modes of sport, exercise, and other forms of movement:

I jog a few times per week and yoga helps with balance and strength. (Case#2; tenure 4 to 6-years)

I think the strength I have developed in yoga helps me with running, hiking etc and general day to day property maintenance. (Case#9; 18-months to 2-years)

It has helped me achieve other fitness goals such as driven me to become stronger, encouraged me to improve cardio fitness. ... to embrace the outdoors. (Case#21; tenure 18-months to 2-years)

Body preparedness for walking, tramping strength and responsiveness for squash ... (Gwen Survey; tenure 18-months to 2-years).

I feel that yoga and breathing has helped improve my scuba diving, using less air and being calmer underwater. (Case#21; tenure 18-months to 2-years)

One comment referred to an increased level of fitness, or endurance, from yoga:

I have more strength and can continue other forms of exercise for longer. (Case#11; tenure 6 to 8-years)

This survey participant went on to explain that yoga had improved her range of mobility, e.g. "in terms of bending", which is suggestive of improved function and thus prevention of injury. Perhaps a benefit more front of mind given her age range of 56 to 65 years. For transparency, the researcher's personal experience of practice and being amongst seasoned yoga practitioners, has informed the lens of yoga influencing mobility and function; a benefit that seems more apparent with increased age. Yet a second participant within the same age range did comment on an extended capacity to participate in sport, supportive of this viewpoint:

I am able to continue to exercise in other disciplines where I don't think I would be able to do so unless I was doing yoga. I am also able to continue in my sport at an age when most would not be able to. (Case#25; tenure >10-years)

4.3.4.4 Theme 8: Yoga applied

The yoga applied theme relates to RQ1, and includes examples of participants applying learnings gained through yoga 'off the mat'. For example, the use of breathing techniques in the context of stress management. This theme thus identifies participants' application of yoga in their lives, which is an example of yoga influencing behaviour, including examples of self-regulation. Seven of eight interviewees provided 28 responses that were coded to this theme, while the theme was less prominent within the survey cohort at a theme frequency of 19. The data provided examples of participants consciously using breathing as a tool to face everyday challenges, e.g. caring for young children; and applying postural awareness, such as when sitting at a computer.

Being able to self-regulate internally through the use of yogic strategies or tools is a common theme within the data:

... it's given me tools for dealing with anxiety and worry and negative mindsets. ... I'm a much nicer person to be around. ... I probably can deal with my own moods and critical thinking better. (Gwen Interview; tenure 18-months to 2-years)

[Yoga] mainly equips me with tools to meet my life more fully. (Gwen Survey; tenure 18-months to 2-years)

Gives me tools to cope with stress through breath focus ... (Case#31; tenure 4 to 6-years; teacher).

Every time I feel stressed, I can control myself and meditate and come back to the present instead of spiralling down and feel (sic) even more stressed. (Case#1; tenure 18-months to 2-years; teacher)

Sometimes I find myself in difficult or stressful situations paying attention to my breath to calm myself down. (Case#2; tenure 4 to 6-years)

When feeling particularly stressed, I revert to breathing practice to restore my calm, even in a busy location, like an airport. I have a fear of flying and use breathing practice when in the air. (Case#25; tenure >10-years)

Mentally it has given me techniques to get through challenging times or situations. For example, breathing techniques, positive thinking. (Case#10; tenure 6 to 8-years)

This last participant did also identify that the application of yoga techniques was a work-in-progress, despite her practice tenure of 6 to 8-years:

[Yoga] is helping me to develop coping mechanisms for dealing with situations in everyday life that I find challenging. (Case#10; tenure 6 to 8-years)

Breathwork (*prāṇāyāma*) features prominently in the above examples. Breathwork also appears within the practice category (to follow) as participants shared different aspects of their yoga practice. However with respect to the application of yoga ‘off the mat’, one interviewee simply noted:

... every situation is just breathing into it ... (Amy Interview; tenure 6 to 12-months).

A philosophy matched by two survey participants. One explained that yoga had enabled her to “breathe through situations, rather than react” (Case#3; tenure 2 to 4-years; teacher); the other described a process of “learning to use your breath to breathe through situations”, such that the practice provided an opportunity for self-development (Case#7; tenure >10-years).

More individual examples of self-regulation embraced a sense of either being unfazed by the demands of life or feeling fully prepped to face whatever arises:

I have applied what I have learnt on the mat (contemplating and tackling challenges) into my life and realise there is nothing that really fazes me anymore. (Evelyn Survey; tenure >10-years; teacher)

[After yoga] I feel like I have set myself up for whatever happens in my day. (Case#17; tenure 4 to 6-years)

As noted prior, these descriptions denote a place of self-agency from which to face life, arising from a yoga practice. One brief survey response encapsulated it well, by affirming that yoga resulted in the “physical and mental endurance to cope with ... life” (Case#18; tenure 6 to 8-years; teacher). Finding a tool — in this case, yoga — that can support how one responds to life is likely to increase a sense of control and agency. Marsha (tenure >10-years) summarised the application of yoga to self-regulate amidst one’s life as:

A day that starts with yoga is generally a day that gets off on a better foot ... (Interview).

The practice had provided one survey participant with “tools for nurturing ... mental and emotional wellbeing” that were rooted within a greater self-awareness of her own psychological state (Case#14; tenure 2 to 4-years). Whilst the following examples describe a more spiritual experience:

It has allowed me to have spiritual experiences in a different way.
(Case#17; tenure 4 to 6-years)

It has allowed me to find my own way in this life, and to sense my
connection to the wider universe. (Case#27; tenure >10-years; teacher)

In another context, a brief survey response provided an eloquent example of yoga's application amidst the discomfort of work-place politics, asserting that "[Yoga is] ... essential to [sustain] equanimity" (Case#26; tenure 4 to 6-years). To close up this theme, one of the survey cohort provided a response that exemplifies the application of yoga when sharing her thoughts on how the practice had supported her life:

Yoga is just there in every aspect of my life. At times of stress I use my knowledge to manage [with] strategies yoga has taught me. (Case#20; tenure >10-years)

Whilst Marsha offered a simple summation of this theme with her comment regarding her practice as a tool to apply whenever she doubted what to do:

If in doubt I go to the mat and get back on track. (Survey; tenure >10-years)

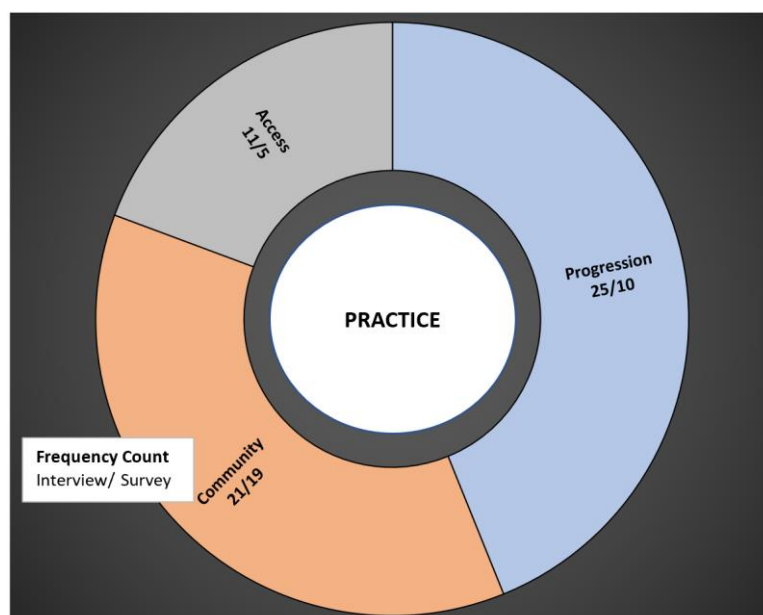
4.3.5 Category 3: Practice

All I do now is turn up to my mat and practice. ... I really don't expect anything.

The practice category collated coded items into three themes: progression, community, and access, with a subtheme of commitment as a subset of the progression data. Interviewees had 57 coded items, with a total frequency count of 34 for the survey cohort. Comments coded within this category included participants' experiences or desires to evolve their own practice and/or their knowledge of yoga; their commitment to the practice; reference to a sense of community gained through yoga; and any mention of accessibility to yoga (including but not limited to location).

Figure 5

Theme frequencies for the practice category



Proportional representation indicative of interview cohort.

4.3.5.1 Theme 9: Progression

Overall, the progression theme frequency for the interview cohort was 25, with 10 coded responses from the survey cohort. Comments captured a desire to explore yoga more fully in the future, e.g. through attending retreats, trying different yoga styles, increasing practice frequency, learning about the history and philosophy underlying the practice, or becoming a teacher. The addition of more meditation, breathwork (*prāṇāyāma*), or chanting within practice was also discussed, and the desire to move towards a self-directed, rather than teacher-led practice, as shown by the following quotes:

I think [my future practice] still will be a strong, solid practice, but probably a lot more meditation. (Evelyn Interview; tenure >10-years; teacher)

...within a year ... I'd like to be more actively developing my own practices. ... I'd like to do a bit more [breathwork and chanting] and be a bit more self-designing. (Gwen Interview; tenure 18-months to 2-years)

I would hope ... that ... I'm leading myself. (Marsha Interview; tenure >10-years)

Though the last comment was contrasted with Marsha sharing that she would “prefer to switch off and let somebody guide me ... “ (Interview; tenure >10-years).

Despite being in her first year of practice, Amy indicated that she “definitely will be doing the yoga teaching”, but out of interest rather than a firm desire to teach. Though adding that if she “evolved in (*sic*) becoming a teacher, then [she is] open to that” (Interview; tenure 6 to 12-months). Cleo shared her aspiration to learn about the history of yoga “to understand it more”, with the idea that “probably in that journey I'll find what yoga means more to me as well” (Interview; tenure 18-months to 2-years). Evelyn — with more than 10-years practice tenure — simply asserted that:

You become your own teacher ... (Interview; teacher).

4.3.5.1.1 Subtheme 9a: Commitment

The subtheme of commitment may, at first glance, seem like it would fit under adherence (within the health behaviour category). However, the adherence theme focussed on strategies that participants had put in place to support adherence, and a disciplined mindset. In comparison, this subtheme captured the experience of participants fully committing to their yoga practice, for their own unique reasons, such that it was a priority. Participants' connection, and thus commitment, to yoga had expanded over their practice tenure.

Commitment featured most prominently across all participants in response to the survey question: Do you practice yoga when you don't feel like it? In fact out of the 38 participants, only two responded with a negative response to this question, one from each cohort. Perhaps surprisingly, both of the negative responders had a practice tenure of more than 10-years. Whilst the same question prompted comments on a disciplined adherence, the examples for this subtheme had a gentler, reflective perspective on practice, as evidenced by one survey respondent who experienced a commitment to yoga that had even surprised herself, despite her comment that it is a foundational practice in her life:

I think it's a foundation for me ... I am pleased with my tenacity and perseverance and even though there are times when I can't get to yoga for periods of time I always come back - that is unexpected as I might

tend to drop out. But I keep coming back. (Case#19; tenure 6 to 8-years)

Practice frequency was also mentioned a couple of times within the context of a commitment to practice:

I have committed myself to practice whenever I have the chance (I try for most days). (Liam Survey; tenure 6 to 12-months)

I practice at least 4 times a week at a studio and meditate at home. ... Yoga is the best thing I have ever started and always develops. (Case#21; tenure 18-months to 2-years)

Marsha noted a lifelong commitment with a frequency that ebbed and flowed:

I have continued with yoga throughout my life, sometimes with more frequency than others because of the numerous benefits I personally believe I get from it. ... I know that practice, even for just a little bit, will help connect me back into myself or ground me. (Survey; tenure >10-years)

Commitment to practice regardless of outcomes was noted by Libby, who explained that she had different priorities, due to “getting older and ... [having] less ego”. Her commitment was simply to show up for her practice:

All I do now is turn up to my mat and practice. ... I really don't expect anything. (Libby Survey; tenure >10-years; teacher)

While a survey respondent described her yoga practice as her “drug of choice”, adding “I need my weekly fix as a minimum.” (Case#25; tenure >10-years)

4.3.5.2 Theme 10: Community

The community theme had a frequency of 21 and 19 for the interview and survey cohorts, respectively. The social element of group classes featured in a number of comments, ranging from being around people with a shared interest, to feeling a synergy with others during a group class, and a feeling of community. In addition, participants felt supported by their yoga community, demonstrated by the following examples describing a safe environment, feeling motivated by the group setting, and gaining energy from the group experience:

... allows me to be vulnerable in a safe environment and it allows me to breathe in a safe environment. (Amy Interview; tenure 6 to 12-months)

... when I go to a yoga studio, the motivation's much more, because you're there, you're in that space. (Cleo Interview; tenure 18-months to 2-years)

... the environment where you spend time with people that could provide energy as well, not energy draining. (Amy Interview; tenure 6 to 12-months)

The synergy of being around others in class was also noted by Amy who described it as feeling an "aura" (Interview; tenure 6 to 12-months). Joining in with other people in a group class proved to be a motivating factor, with further examples including:

I need to turn up to the studio and be with other people and with the instructor ... (Liam Interview; tenure 6 to 12-months).

I find it hard to get motivated at home. I've tried [a home practice], but I just don't feel like I can get into that space. ... Sometimes it's just easier to go out away from home and all the other stuff. (Cleo; tenure 18-months to 2-years)

Note the last comment was suggestive of finding a space away from commitments associated with home life.

A sense of community was valued by participants, with comments highlighting the social and supportive elements of attending a studio. In response to the survey question 'What does a yoga practice mean to you', one survey participant simply stated:

"Relaxation, health, social contact with like-minded people." (Case#20; tenure >10-years)

Another survey respondent shared how she had "been welcomed into several yoga communities, which helps stay committed to [her] practice" (Case#27; tenure >10-years; teacher), i.e. the community bolstered her attendance, which is interesting to hear from a yoga teacher with over 10-years practice tenure. Participants' experience of community is well documented by the following examples:

It's a ... social thing. ... It's good to meet ... such a wide variety of people ... all with the same sort of interest." (James Interview; tenure >10-years)

... at the studio where I go ... there's a ... community feel to it ... (Libby Interview; tenure >10-years; teacher).

I have developed friendships with the people I practice with. I can share my yoga practice and knowledge with others. (Libby Survey; tenure >10-years; teacher)

... the connections and community is so heart-warming ... (Case#8; tenure 4 to 6-years; teacher).

I've also enjoyed a sense of community at some of the classes I attend, where I had thought it would be a solo practitioner's setting. (Case#15; tenure 6 to 8-years)

My yoga practice has also put me in touch with a social network of other practitioners and teachers, so has helped provide a strong community for me ... The yoga community is so supportive, inspiring, and influential so I find that integrating with this type of community is very helpful in life. (Case#32; tenure 4 to 6-years; teacher)

The last example suggests that the community offers a supportive framework and/or inspiration that the participant has found helpful 'off the mat'. Further experiences of support were captured:

... the people that I've met at the studio are just genuine and supportive men and women of all ages, cultures, abilities. It's a great leveller. I didn't expect to find a kind of community but that seems to have happened although everyone is good at maintaining respectful boundaries. Teachers are very professional and supportive. (Case#19; tenure 6 to 8-years)

I feel I can ask questions, I felt anonymous at [the] gym ... I also feel I could talk about yoga and my life if I needed to with the teachers and that they would support me. (Liam Survey; tenure 6 to 12-months)

I have ... felt a sense of being part of a community and been on the receiving end of unconditional love and kindness from several different class instructors. (Case#17; tenure 4 to 6-years)

The last two comments refer to support from class teachers that is beyond guidance during the class. Examples of being able to talk about life in general and receiving gestures of kindness, suggestive of a social element beyond the movement practice itself.

Cleo went so far as to describe her studio as feeling "like home"; adding that "I feel I belong to something special." (Survey; tenure 18-months to 2-years) Whilst Evelyn emphasised the "community of likeminded people searching for a similar goal" (Survey; tenure >10-years; teacher) in response to the question on how she would promote yoga to others. This question of promoting yoga was answered in a similar manner by a survey participant who highlighted a "supportive and non-judgmental environment" that is "really important for new people" (Case#19; tenure 6 to 8-years). This fits with the example from

the same participant above, indicating her surprise at finding herself part of a community, and thus this aspect stood out as one to share with others new to the practice. Another survey respondent provided a description of the yoga community as “a bit like church, finding a tribe”, and underscored the opportunity of “sharing time on and off the mat with people who hold similar values” (Case#3; tenure 2 to 4-years; teacher). As she summarised: “Rubbing shoulders with others on a similar journey” was part of the experience of attending classes.

4.3.5.3 Theme 11: Access

Coded items for the access theme emerged 11 times for the interviewees, and five times within the survey cohort. Responses assigned to this theme referred to location of studio, i.e. easily accessible, or the ability to fund classes in order to sustain a practice. In addition, the simplicity of being able to practice at home with just a yoga mat ensures yoga’s accessibility, for those who have the experience to do their own self-guided practice. As James noted, yoga “can be done anywhere there is a flat surface.” (Survey; tenure >10-years)

4.3.5.3.1 Subtheme 11a: Location

Location was the key subtheme to emerge with respect to access to practice. As one would expect, being close to a yoga studio, or having a studio located between home and work, was advantageous to a regular practice. As James, who had a studio “just ... up the road” from his house stated:

I’m pretty sure I wouldn’t be going so regularly if it [the studio] wasn’t so close. (Interview; tenure >10-years)

Cleo also found a close studio crucial to practice frequency, as once she had moved closer she was “able to go a lot more” to class; whereas prior to that when she “lived out of town ... it was really hard to make it. (Interview; tenure 18-months to 2-years)

Timing of class also aligned with location, as per the following examples:

[The studio is] on the way to work ... between home and work. I start work at eight, and I can do a 6.30 practice. So there was a convenience aspect that allowed me to build more continuity in the last two years. (Gwen Interview; tenure 18-months to 2-years)

I go down to the gym [at lunchtime], which is right next door to my work in town ... and I just roll out my mat.” (Evelyn Interview; tenure >10-years; teacher)

In the first example, fitting a yoga class in first thing on the way to work had facilitated a sustainable practice amidst the daily routine; whilst for the second example, accessibility close to work provided the opportunity for a lunchtime self-directed practice. This combination of easy access with timing featured in a response from a survey participant, who attended her first yoga class because “it was near [her] house ... and [she] liked that it was an evening thing [she] could do.” (Case#26; tenure 4 to 6-years) Adding that she has plans for retirement such that she “wouldn’t retire anywhere that didn’t have a yoga studio”.

With respect to having sufficient funds, the comments ranged from acknowledgment of being able to access yoga, to access being instigated by low cost or discounted classes. Gwen expressed gratitude with the comment:

I’m just really appreciative of ... funding [the practice] ... of being able to go when I want to.” (Interview; tenure 18-months to 2-years)

A feeling matched by a participant from the survey cohort who shared:

... the benefits for me have been very real and I’m fortunate to be able to have access to this. (Case#19; tenure 6 to 8-years)

Prior to attending a studio, she had initially begun with “inexpensive yoga classes” close to home “in a community hall” (Case#19; tenure 6 to 8-years), thereby aided by low price and accessibility in the initial stages of practice. In a similar vein, Liam started yoga via the impetus of a “special deal” for a “six week course” of classes (Interview; tenure 6 to 12-months). He then had a 15-year hiatus before restarting a yoga practice after gym-based movement classes weren’t “quite doing it” for him. In retrospect it would have been useful to clarify in the interview what caused the hiatus, i.e. to confirm whether or not it was a funding issue. Of note also, Liam classed himself as a new practitioner of 6 to 12-months tenure, i.e. discounting the initial 6-week experience that had not evolved into a movement practice 15-years prior.

One final survey response regarding access referred to a home practice, with the participant sharing that she used a “yoga app to practice ... when I feel that I need more than my weekly class” (Case#25; tenure >10-years). Access to virtual yoga classes will feature in the Discussion chapter, given the shift towards virtual communities and movement classes in the post-COVID era (after this study’s data were collated).

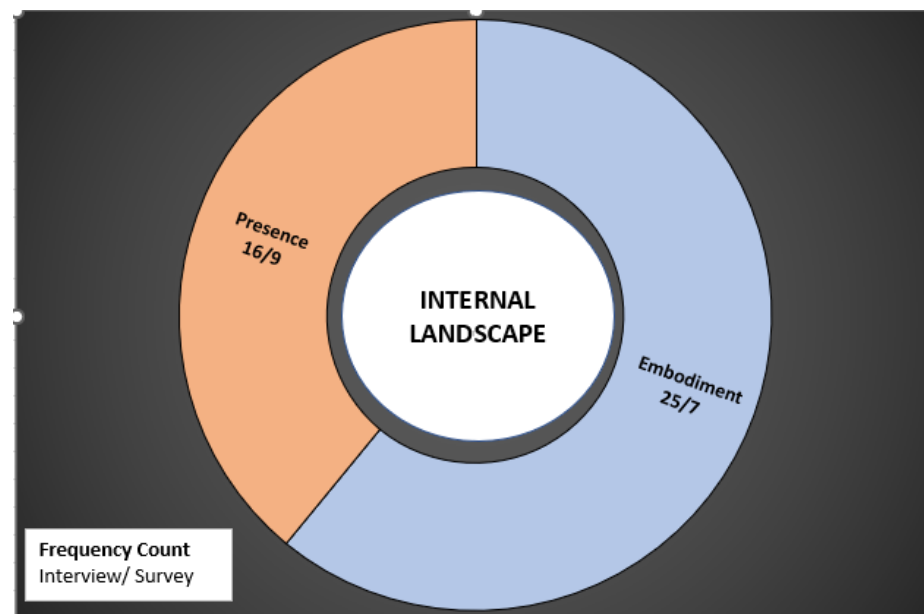
4.3.6 Category 4: Internal landscape

A yoga practice is a time when I can tune in.

Internal landscape relates most closely to the concepts of interoception and mindfulness, via two major themes of embodiment and presence. Subthemes emerged from both themes: breath within embodiment; and two presence subthemes of intention and attention. In addition, this category captured the meditative aspects of practice, including breath awareness. The total frequency count for this category was 41 and 16 for the interview and survey cohorts, respectively. The lower count for the survey cohort could be a result of the limitations of a survey format to access the more subjective aspects of participants' experiences, though the exemplar quotes from survey responses (for both cohorts) do reveal descriptive comments via the open-ended survey questions.

Figure 6

Theme frequencies for the internal landscape category



Proportional representation indicative of interview cohort.

4.3.6.1 Theme 12: Embodiment

Embodiment, as defined prior, is the *experience* of interoception; in other words, the felt sense or awareness of being in one's own body. As such, coded items for this theme referenced a 'felt' sense or embodied experience by participants. Embodiment had a theme frequency of 25 for the interview cohort, while seven relevant coded items from the survey cohort.

Participants' explanations of embodiment were best exemplified as follows:

... in yoga I can actually inhale ... and then pause and just feel what I'm feeling, and then exhale what's not serving me. (Amy Interview; tenure 6 to 12-months)

... when I say mind, I don't just mean the thinking mind. I also mean ... that kind of interplay of feeling. The body feeling that goes with that. (Gwen Interview; tenure 18-months to 2-years)

I just felt more of how ... my mind and my body were more connected ... (Cleo Interview; tenure 18-months to 2-years).

I can scan my body of any tension and release it through my practice. (Case#28; tenure 4 to 6-years)

The benefits of embodiment were summed up as a state of attunement within by one survey participant, with the following statement:

Feeling and "being in your body" is a highlight if you are in a sedentary job or if you're in a very physical job. It tunes you into where your body and mind is (sic) at on any given day. (Case#19; tenure 6 to 8-years)

Going on to add, in response to a question on any effects of practice to physical health:

I notice my breathing and feel more physically "alive" ...

Time on the mat in practice facilitated 'being', or as another survey respondent précised as:

...it is a time where I can be myself by myself. (Case#34; tenure 2 to 4-years)

Participants described an enhanced experience of movement through yoga, e.g. by eliciting "a more body-wide contribution to movement", enabling a "noticing ... [of] the subtle holding", an increased "body awareness", and a deeper connection or "integrity to

each ... motion, each pose ...". Gwen commented that yoga gave her both a "sense of vitality" and of being more engaged in life, adding that:

It kind of feels like I'm embodied in my life in a very liberating way.
(Interview; tenure 18-months to 2-years)

Whilst further comments regarding an increased embodiment through yoga, included a sense of being more aware of how to look after the body, or feeling attuned to sensation. As two survey participants explained:

A yoga practice is a time when I can tune in. (Case#33; tenure >10-years; teacher)

I feel more in tune with my aging body. (Case#37; tenure 8 to 10-years)

Thoughts matched by Marsha:

I'm becoming really aware of myself, inside and out. I think through yoga. ... yoga is the time when I can slow down and ... get back into my skin ... (Interview; tenure >10-years).

Embodiment through yoga was akin to developing an extra sense from which to view the world, or at least "accessing that kind of sense" from which "subtle holding" could be felt, i.e. the refinement of a felt sense of interoceptive awareness. The experience of living from an embodied place was captured in the interview with Gwen (tenure 18-months to 2-years), who vividly expressed how a "kineasthetic experience ... has been really important in ... having another experience of being". This different 'experience of being' was further clarified as being "more neutral", rather than "so heady ... not so mind and emotion", i.e. a sense of 'being' with embodiment at its core, as opposed to being driven by thoughts, feelings, and/or the mind.

4.3.6.1.1 Subtheme 12a: Breath

A subtheme for breath was created to capture comments that provided insight into the felt sensation of breathing during practice, with participants highlighting a conscious intention to observe the breath and using it both on and 'off the mat':

... breathing my way through problems and breathing my way through, through my practice. (Liam Interview; tenure 6 to 12-months)

...allow my breathing to go into tension in my body ... (Amy Interview; tenure 6 to 12-months).

I have learnt to breath deeper and [am] more in tune with breathing.
(Case#3; tenure 2 to 4-years; teacher)

... I can use that [awareness of breath] when I'm not doing a so-called yoga practice. ... I can access that off the mat or outside of the practice. (Gwen Interview; tenure 18-months to 2-years)

... connecting with my breath and "arriving" back into me. (Marsha Survey; tenure >10-years)

The ability to use breath to cope with problems and accessing breath awareness OTM does link to the yoga applied theme (within the health behaviour category).

4.3.6.2 Theme 13: Presence

The presence theme had a frequency of 16 and nine for the interviewees and the survey cohort, respectively. Presence indicated a state of being present in the moment, which related to the most prominent subtheme of attention. In addition, an intention to be present was also captured.

4.3.6.2.1 Subtheme 13a: Attention

The second subtheme of attention is best defined by participants (n=10 total; 4:6 interview versus survey cohorts) as the act of re-focusing the mind, as revealed by the following quotes:

Mostly it's around softening or creating space around something, a focus ... a honing of my attention ... (Gwen Interview; tenure 18-months to 2-years).

... a space just for me where I look after myself and only have to think about me in that time. (Cleo Survey; tenure 18-months to 2-years)

[Yoga offers] Space - time to yourself to slow down and go inwards.
(Case#8; tenure 4 to 6-years; teacher)

[Yoga is] a time for me to focus in a quiet contemplative way on just me and my body ... (Case#38; tenure >10-years).

... yoga is the time when I can slow down and ... re-ground and re-group and just re-focus ... (Marsha Interview; tenure >10-years)¹⁶³.

Note the descriptions of softening, spaciousness, quiet, and slowing down. As one survey respondent shared, the refinement or fine-tuning of attention can take time:

Yoga slows my busy mind but it can often take most of the class before I can stay focused and forget the outside world if there is something bothering me. (Case#34; tenure 2 to 4-years)

Evelyn explained that she had “slowed down the practice” in order to “give more integrity to each motion” (Interview; tenure >10-years; teacher), and to facilitate focus on the breath. The use of the word integrity was not clarified during the interview, which would have been useful as it lends itself to two interpretations in this context. Maintaining integrity with movement could refer to joint integrity (or stability) in order to avoid injury, or — more applicable to this subtheme — integrity could suggest a state of attending to the experience of being in the practice that is an integral feature of yoga versus other movement modalities. Another technique to direct attention was provided by a survey participant who was “learning to channel [her] thoughts on the mat” by the use of “gratefulness as a mind mantra to bring [her] back” (Case#3; tenure 2 to 4 years; teacher).

Overall, this attention subtheme closely resembles the act of being mindful, which has been part-defined as “regulating the focus of attention” (Bishop et al., 2004, p. 232) alongside accepting what is (as noted earlier in the OTM subtheme of perspective).

4.3.6.2.2 Subtheme 13b: Intention

The smaller subtheme of intention had a few mentions (n=4 across all participants) within the context of setting an intention to guide presence during practice, such as “to breathe with awareness throughout the whole practice”. One survey respondent actually used intention as a means of processing her day, so rather than applying yoga ‘off the mat’, she purposely used her practice to shift her emotional state via intention:

¹⁶³ Part of the above quote — “yoga is the time when I can slow down” — was coded in relation to embodiment but is repeated here simply to provide an entry point or context to the comment regarding re-focusing, which best aligned to the attention theme.

If something does upset me or I find I am "carrying other people's stuff" I can set my intention at the start of a yoga practice that whatever it is will be gone by the end of the practice, and it always has. (Case#17; tenure 4 to 6-years)

4.3.7 What does a yoga practice mean to you?

To close up this chapter, it seems apt to return to a central feature of this study: to capture participants' own experience of their practice, and in so doing, explore the subjective meaning they assigned to their yoga practice. Meanings that arise out of a lived experience of practice are likely to be as unique as the participants themselves. As such, this final section of the qualitative findings considers participants' responses to the question: What does a yoga practice mean to you? A question that was unframed by the researcher, and indeed, when interviewees sought additional clarification on the question, the guidance provided to the participants was to make the question their own with whatever words came to mind, i.e. completely open to interpretation. In fact, the interview question was worded more directly: What does 'your' yoga practice mean to you? In contrast, to the survey question: What does 'a' yoga practice mean to you? Thus inviting subjectivity from the lived experience of yoga that is central to this study. To note, this data has been incorporated within the themes above, thus some of the coded items (responses) specific to this question will have been used as thematic quotes.

The following table (Table 18) compares survey and transcript data for the interview cohort, and for the majority (n=7/8) there was a similar response (indicated by the bolded words in the table). An interesting finding, given that one would expect a more holistic viewpoint from an interview context, and potentially, from the more direct wording ('your' practice versus 'a' practice). Only the last two interviewees in the table differed in their survey and interview responses. In particular, Marsha's survey response looks like a definition of yoga: "It can be in a studio, at home, in a gym, outside or virtually anywhere."; rather than the more personal narrative offered in the interview: "... yoga just helps me ... get back to me." Whilst Evelyn expanded beyond the physical focus of her survey response to encompass her experience of yoga being "meditation in movement" during her interview. To note, the interview transcript for Liam was a bit patchy due to a poor connection. The actual question was not in the transcript. This omission could have been due to either the poor connection, or the researcher following the flow of the conversation.

The semi-structured interview guide was used for all interviews to ensure all of the questions were covered, but occasionally the participant covered a topic without the need for a question to be asked (aside from a follow-up question to clarify where required).

For the survey cohort, question responses were analysed according to word (or term) frequency, to gain insight regarding the use of any common language. Similar derivatives of words such as physical/physicality, or presence/present were captured as one. The following words predominated:

- exercise/physical (18 uses of the term)
- peace/stillness/calm/focus/presence/relaxation (17)
- mind-body/balance/wellbeing (14)

These were closely followed by time, mental/emotional, and connection (9 for each). Linked to the most common term (exercise/physical) were flexibility (6), strength (5), health/fitness (5), and lifestyle (5). Likewise, mindfulness/meditation/contemplation (6), breath (6), philosophy/spiritual (5), and de-stress/stress management (5) correspond to the second most common terms above.

Terms that featured less frequently in the survey cohort's description of their yoga practice were: 'off the mat' (4), commitment/regular practice (3), self-love/kindness (2), social (2), and finally (with one mention each) journey, embody, and holistic round out the picture. Some of the survey cohort did provide a simpler response to the question, describing yoga as exercise (n=3), though one did add that it was "exercise for ... mind and body" (Case#23; tenure >10-years; teacher). The shortest response was that a yoga practice is "Yoga that I do regularly" (Case#11; tenure 6 to 8-years).

If we layer the qualitative themes on to the survey cohort's term frequency, the themes of mind-body, presence, and balance best equate to the dominant language defining a yoga practice. Whilst at the category level, it is not unexpected that the practice category features in the narrative, incorporating progression (meditation), commitment, and community (connection), alongside the internal landscape category, with breath and attention (focus). Overall, the dominant language from both cohorts describes a yoga practice as a combination of physicality with mental focus and/or calm; a broad definition that encapsulates yoga's mind-body influence. This is accompanied by the concept of a practice providing the opportunity of 'time' to focus, breathe, move, and/or connect with oneself.

Table 18

Personal definition of a yoga practice from interview cohort data

YOGA PRACTICE Personal definition	Survey Data	Interview Data
Amy (tenure 6 to 12-months)	Journey to yourself - being present	Vulnerability ... is what ... yoga means to me. Because without allowing myself to feel vulnerable, I will never be able to open [to] what's really deep inside me .
Liam (tenure 6 to 12-months)	It is my commitment to try and be a better person . To become stronger, more supple, and to heal my past and my future. Yoga is my hope and trust in a better way forward.	For me it's trying to make me a better person and trying to sort out problems and issues in life I don't really even know about or understand ... and I kind of see it as prepping me for my older age ... just prepping me for life really.
Gwen (tenure 18-months to 2-years)	A period of time where I am deliberately focusing my attention. It can be momentary or extended. Often using the breath as a tool (for focusing my attention) or breath with movement and/or with chanting. I see it as a tool /an opportunity to strengthen my awareness of experience that is less identified with my personal self	Well, it's kind of like surfing. ... It allows me to surf my life. So ... it gives me a sense of freedom. Because ... my sense of vitality gives me a sense of engagement. And ... it's kind of embodied. It kind of feels like I'm embodied in my life in a very liberating way. ¹⁶⁴
Cleo (tenure 18-months to 2-years)	It means me time, a space just for me where I look after myself and only have to think about me in that time. It helps me to look after my health better and stay hydrated. Mentally I feel it helps my mood and my body away from aches and pains of old injury.	... it is very important to me ... for head space and also I notice for hot yoga, I feel like I do release a lot of toxins when I sweat. And when I don't do the hot yoga ... I can feel the toxins in my body build up.
Libby (tenure >10-years; teacher)	Mostly a physical practice based on <i>āsana</i> , with a focus on breathing and awareness . I also consider yoga practice 'off the mat' especially through an awareness of my actions and responses and the impact they may have on those around me.	The first thing I think ... is that it's important for me to focus and I'm not too sure if that's what it means to me. That's what's important ... I enjoy that opportunity to go and focus for 90 minutes. ... it means an important opportunity to focus , to go to some degree of meditation.
James (tenure >10-years)	Being able to maintain strength and flexibility while attending a studio with supportive and happy instructors and other practitioners from all walks of life.	I don't think it's ... the be-all or end-all, but it certainly keeps me ... supple ... I like what it does to the body and it sort of has a calming effect on the mind. ... It's also a social thing.
Marsha (tenure >10-years)	To me a yoga practice is spending 15+minutes focusing on my breathing and moving through a series of yoga postures, movements or stretches. It can be in a studio, at home, in a gym, outside or virtually anywhere. And led by a teacher, video, audio only or self-guided.	It means me time ... It means that I stop and ... slow down and relax. ... for me, yoga just helps me ... get back to me.
Evelyn (tenure >10-years; teacher)	In terms of an <i>āsana</i> practice, it means practicing āsanās at least four days a week and incorporating yoga principals such as Yama and niyama on and off the mat	... that's my pure physical workout . Like, I mean, I don't, other than going for walks and so forth. I don't do anything else. ... It's learning to slow it down and actually it's kind of like a meditation in movement. That's how I would describe it. ... for me, yoga is being able to find the calm in craziness. ... wherever you are ... just zone out ... [from] distractions ... you just go to that ... meditation in movement.

¹⁶⁴ Gwen finished her response by saying: "Don't know if I can add to that really."

4.4 In Summary

This chapter provided details of the participants, both the survey and interview cohorts, and explored the quantitative and qualitative findings from a range of perspectives. For example, a consideration of practice tenure as it related to a home practice or teacher status; and exploring participant themes from a thematic and interpretive phenomenological lens. Categories were ordered according to their theme frequencies within the richest data source (the interview cohort), from the highest (category 1) to the lowest (category 4) frequency. As such, the presentation of the findings clearly shows that the two research questions¹⁶⁵ align to the first two categories of impact and health behaviour respectively. The last two categories provided insight into different aspects of practice that participants felt were important to share, both from an external (e.g. community and access) and an internal (e.g. embodiment) perspective.

In the chapter to follow, these findings will be considered afresh in light of the literature. The Discussion will integrate the findings so as to pinpoint the key features of the data 'landscape'. The goal being to highlight unique findings from this participant sample, beginning with how participants assign meaning to their yoga practice, i.e. speaking directly to the participant experience of yoga. A philosophical lens, using Patanjali's Yoga *Sūtras*, will also be applied to connect the findings to an historical source. Not forgetting that these findings are rooted in the modern day, and generalisability of qualitative research relies on the context within which the participants are situated (Braun & Clarke, 2022). Therefore, sensitivity to this context, including the wider NZ setting; the social and cultural norms within which the participants access yoga and connect with a yoga community; and the parameters within which the data were collated; supports transferability (Braun & Clarke, 2022). The Discussion will thus include a reflection on how the research setting, and indeed the questions posed to participants, may have "shaped or inflected" (Braun & Clarke, 2022, p. 146) the data.

The central intent of the Discussion chapter is to layer the participant voice on top of the current research narrative. To restate the data 'landscape' metaphor: How does the experiential map of this study fit on, or within, the narrative map laid out in the Literature

¹⁶⁵ **RQ1:** How has a movement practice (yoga) impacted practitioners' lives 'off the mat'? **RQ2:** Is there a relationship between adherence to a yoga practice and pro-health habits?

chapter? What does the lived participant experience say about yoga 'off the mat', and pro-health habits? Did the experiential data provide any perspectives on practice beyond the research questions? These inquiries form the bedrock of the final chapter.

CHAPTER 5: DISCUSSION

5.1 Overview

The overarching aim of this thesis was to explore whether long-term yoga practitioners felt supported by their practice, and if so whether the experienced downstream influence of yoga 'off the mat' included self-regulation in the context of adoption and adherence to pro-health habits (diet and physical activity). The two research questions were:

RQ1: How has a movement practice (yoga) impacted practitioners' lives 'off the mat'?

RQ2: Is there a relationship between adherence to a yoga practice and pro-health habits?

The research design used a 'real world' approach to limit any influence on the practice, rather than prescribing a yoga 'intervention'. By accessing participants' own unique yoga practices, the aim was to consider whether any practice components, such as tenure, frequency, or dose, supported self-regulation in daily life. Thus, while the qualitative focus was on the experience of yoga 'off the mat', the quantitative component data provided a complement through which to consider any patterns between specific practice components (or teacher status) and participants' experience of yoga's 'off the mat' influence. Participants (n=38) self-selected as yoga practitioners (aged 18 to 65-years) who considered yoga to be their primary movement practice, and were recruited through advertisements at yoga studios located around New Zealand.

After an overview of the emergent themes, this chapter will outline the meanings that participants assign to their yoga practice, alongside a look at how the practice components interrelate, and the language used to describe an integrated practice (with meditation). Overall findings are then reflected on using the *sūtra* lens as an historical framework guiding the experiential narrative as an external and internal practice, and the extent to which participants experience an integration of the yoga practice 'off the mat'. Or, in other words, embody the *sūtras* in their relationship to themselves, others, and their lives. A second modern day framework from the holistic movement practice field will consider the findings in relation to Vergeer and Biddle's (2021) five categories of influence at play in the practice: physical, mental, psychosocial, philosophical, and contextual

(location). Throughout, thematic concepts, are considered relative to the two research questions and the published literature, commencing with self-regulation and mindfulness, i.e. broader concepts, before discussing the shared experiential themes that rose to the surface during the qualitative analysis.

This doctoral study is then situated within the present day context, i.e. the COVID-19 era and the associated shifts in population health priorities, alongside the relationship of the study to the current research discourse. Implications and recommendations inspired by the study process and findings are discussed, and a reflective section captures the researcher's reflections on the findings, and both the limitations and strengths of the study's approach. The chapter concludes with a summary focusing on how this thesis adds to the wider qualitative research field, and, more specifically, adds to the experiential narrative within yoga, holistic movement, and contemplative practice research.

It is worth clarifying that data saturation was not a goal, nor may it even be possible when using a hermeneutic phenomenological lens (Dibley et al., 2020). Rather, the intent was to unearth consistent patterns and points of interest within the data that spoke to the research questions and illuminated the participant narrative. Using a mixed-methodology, the objective of the 'real world' study design was to explore the lived experience of adult yoga practitioners with a practice tenure range of ≥ 6 -months to > 10 -years. The majority of the study's participants identified as being from European descent, female, in paid employment, with a tertiary education; baseline characteristics that match the norm for published yoga studies, representative of wider societal inequalities whereby accessibility to the practice is limited for more diverse and disadvantaged populations. A desire for yoga (and thus yoga research) to have a broader societal reach is a narrative emerging alongside global cultural shifts towards diversity and equity, such as the adoption of a 'social action research agenda' towards a more "inclusive embodiment movement in yoga" (Webb et al., 2020, p. 367).

5.1.1 Participant themes

Four categories emerged from the participant narrative: impact, denoting the experiential downstream or flow-on effects of a yoga practice; health behaviour to capture the interrelationship between yoga and pro-health habits; a practice category to collate participant responses that discussed the practice itself, rather than the consequences of a

practice; and the internal landscape category as a repository for shared examples of an inner experience.

The impact category had the largest number of coded items, resulting in four themes — ‘off the mat’, mind-body, self-awareness, and balance — that best illustrate the key effects of yoga, as experienced by the participants. These impact themes provide an overall description of a practice that connected and balanced participants’ mental and physical experiences both on and ‘off the mat’, whilst providing a different perspective on their lives, and influencing their actions. The development of self-awareness was experienced as an integral part of yoga’s impact by the participants.

Four health behaviour themes captured practice adherence strategies, examples of the practice facilitating pro-health habits (diet and physical activity themes) and the application of yoga, i.e. tools gained from the practice, in participants’ lives. These last two illustrated contrasting directions of action. Firstly, the practice acting as a facilitator of health behaviour; and secondly, the participants actively applying yogic strategies ‘off the mat’. The practice category collated participants’ commitment to yoga and their changing practice, their sense of community, and access to yoga. Finally, two internal landscape themes captured examples of embodiment and presence. This fourth category illuminated two contrasting elements of a lived yoga practice, as being a combination of internal and external experiences.

5.2 A yoga practice: Meaning-making

The research methodology incorporated two aspects of ‘meaning-making’ (Freeman, 2008): one being the meaning assigned by participants; the other being the interpretation overlaid by a researcher who has their own experience (and thus meaning assigned to) the research topic. This ‘shared meanings’ approach requires vigilance on the part of the researcher (McConnell-Henry et al., 2011). The nuance of meaning may be best uncovered by a researcher embedded in the topic under study, but the researcher has to maintain vigilance in their reflexivity in order to be aware of any personal bias at play in their interpretation, and the ‘intersubjectivity’ between the researcher and participant experience (Smith et al., 2022). In Section 5.5.1 the researcher explicitly reflects on the processes put in place to limit any contamination of the participant narrative.

The subjective meanings assigned to a practice emerged out of experience, resulting in a wide range of yoga practices even within a small sample. Yet, dominant narratives — evidenced by the ‘group experiential themes’ (Smith et al., 2022) — were visible amidst the individual expressions, such as in response to the question ‘What does a yoga practice mean to you?’. Participants assigned meaning to their practice by its mind-body influence, and an experience of presence and balance, resulting in a description of yoga as both a physical, and a calming or peaceful practice that promoted a sense of wellbeing or balance.

By highlighting the physical and mental impacts of their practice, and the balance within and between these two facets, the practice was evidently experienced as a holistic movement practice, combining physicality with mental acuity and/or calm. Time on the mat provided an opportunity to focus, breathe, and connect; concepts suggestive of an ‘embodied interpretation’ (O’Brien-Kop & Newcombe, 2021). The language of ‘embodiment’ used by participants illustrated alternative interpretations of an experience of embodiment, with the term only being used explicitly by one participant from each cohort. The experience of embodiment included accounts of returning to self, focusing on breath, slowing down, and ‘meditation in movement’.

Themes represented the experience shared by participants, which were subjective narratives that often did not mention the exact terms denoting a theme. A prime example being ‘off the mat’, which had the highest theme frequency, yet with minimal explicit use of the term. Meditation and mindfulness featured as descriptors of a practice, alongside a spiritual or philosophical experience, and in the context of applying yoga in stress management. Practitioners’ definitions of their yoga practice emerged out of experience. Overall, practitioners of varied practice tenure, with or without teacher status, described a similar experience of a yoga practice either as a source of tools or strategies they could apply to life situations, or referenced a specific perspective or lens through which to approach life. These experiences (collated thematically) will be considered in relation to the research questions and to the broader concepts of self-regulation and mindfulness in the sections to follow. But first, the discussion will draw out the key findings from the practice component data, in order to shine a light on the participants’ lived practice. After which, the idea of an integrated practice, i.e. including a meditative component, will be considered in relation to the participants’ practice details.

5.2.1 Practice components

Firstly, there is a need to consider the findings with respect to the dual concepts of practice adherence and practice tenure. Whilst yoga tenure does relate to practice adherence, the two are not a requisite. A practitioner can adhere to a practice from the onset, or in other words, length of tenure does not dictate a commitment to yoga. What became evident from the two participant experiential themes most relevant to the research questions — ‘off the mat’ (RQ1) and adherence (RQ2) — was that coded items emerged predominantly from participants with a higher tenure. Almost a third of the ‘off the mat’ quotes were from participants with a practice tenure of more than 10-years, versus 10% from participants new to yoga (6 to 12-months tenure). Similarly, over 40% of adherence quotes were from the highest tenure category, versus 9% from the lowest. Tenure was the dominant practice component equated to the participant ‘off the mat’ and adherence themes.

The practice component data provides a window into the unique practice details of the sample population and their lived practice, rather than providing generalisable data (given the small sample size). Almost half of the participants practiced at one yoga studio, a third had trained as yoga teachers, and a third sustained a home practice. Over two thirds of home practitioners had trained as yoga teachers, indicative of self-efficacy supporting uptake of a personal home practice. Participants’ practices incorporated a wide range of yoga styles, 12 of which had at least two mentions, with the most common style being yin. Just one interviewee and 10% of the survey cohort practiced one style. Similarly, in Wiese et al.’s (2019) multinational survey of over 2,500 yoga practitioners, over half practiced multiple styles, though Ashtanga was much more common (32% versus 13% in this study). To contrast this, a systematic review of 306 randomised controlled trials noted positive outcomes regardless of yoga style, though the most common styles under study were hatha, Iyengar, yoga therapy and *prāṇāyāma* which may limit generalisability (Cramer, Lauche, et al., 2016).

This illustrates the challenge of subjectivity of practice across studies, given that the five most common styles in this study differ to those of Cramer et al. (2016), even though the protocol was similar, capturing the full extent of participants’ primary movement practice (yoga), and other modes of movement or physical exercise. Though the positive outcomes of yoga may be independent of yoga style, one would expect that a preference towards a style of yoga and its associated lineage or philosophy may indeed influence lifestyle. For example, while McKinney (2020) found a positive correlation between tenure

of Ashtanga practitioners and both practice frequency and home practice, the uniqueness of Ashtanga's repetitive sequencing and its regularity of practice (five to six days a week) does bias the results via its promotion of a lifestyle that preferences just one day away from the mat per week. In addition, Cramer et al. (2019) found that Power yoga practitioners exercised more frequently off the mat, whilst Sivananda enthusiasts were more mindful and tended towards a plant-based diet, with the authors noting that the study of yoga philosophy was associated with pro-health behaviour.

In this study, teacher status and home practice equated to a slight increase in tenure and weekly yoga dose; home practice alone adding one extra hour of yoga per week. A finding similar to McKinney's (2020) positive correlation between tenure and both a home practice and practice frequency in Ashtanga practitioners; yet different to Cagas et al.'s (2022b) study that found no relationship between practice frequency (one component of yoga dose) and teacher status. Meditation and home practice provided more definitive findings. Almost 70% of participants practiced meditation/*nidra*, at an average of two to three times a week, with a home practice more than doubling the weekly meditation frequency; suggesting that the home environment was either more conducive to meditation (versus a communal studio), or home practitioners were perhaps a more motivated sub-group. This, in turn, could explain the additional hour of yoga 'dosage' per week. Access to a space at home that allowed for an unencumbered practice does play a part, with one participant noting that they preferred the 'different space' provided by a studio. Though a home practice is not for everyone. The community experience of studio classes, and being able to practice in a different space, e.g. away from home commitments, being a preferred option for some. In fact, the access to community was a factor supporting adherence (see Section 5.3.4.1). The combined impact of teacher status and home practice doubled the weekly meditation frequency.

Triangulation of the practice data (yoga dose) from the online survey and participants' studio attendance data was more accurate for the interview cohort, though only 30% of the survey cohort were audited. As noted in the Findings chapter, inconsistencies could be explained as errors in recall; the difference in actual class duration versus the participants' felt sense of the class length; or participation effect, i.e. providing a response to fit the participants' view of what the researcher is looking for, or to fit with a social 'norm' of what a yoga practice should be.

5.2.2 *An integrated practice (including meditation)*

The majority of participants meditated two to three times a week, indicative of an integrated yoga practice whereby a meditative, mindful, or contemplative component is incorporated within the practice. An integrated definition of a yoga practice, i.e. a practice inclusive of both body and mind, or the physical and the mental/spiritual, is questioned in the literature (O'Brien-Kop & Newcombe, 2021). The focus has shifted recently towards defining holistic movement practices by their physical components (Taylor et al., 2021). Ultimately, as long as research studies are clear and transparent regarding the elements of the practice that are included, it is possible (and appropriate) to collate all elements of a practice, particularly if the study design is based on participants' own practices (as per this study). Indeed, an integrated practice may capture 'synergistic effects' (Field, 2020).

The researcher's own experience of practice over the course of the doctoral journey has been one where meditation has "come to the fore", accompanied by an enhanced interoceptive awareness or "ability to feel into what [the] body/mind needs"¹⁶⁶. Tenure did not dictate inclusion of a meditative component to practice. *Nidra* was the most popular meditation style, closely followed by guided meditation (either during in-person classes, or practiced solo). As noted, practicing solo (at home) supported meditation. In-person classes were either less conducive to meditation, or perhaps did not allocate sufficient time for meditation to become an integral part of practice. Access to the resources (time and space) to practice at home was clearly supportive of a more frequent meditation practice. The literature regarding a home practice did not specifically discuss meditation, but found a link between a home practice frequency and health (Neumark-Sztainer et al., 2017; Ross et al., 2012). One interviewee provided an alternative perspective, preferring to practice in a space away from home to fuel her motivation. The definitions of practice provided by interviewees who meditated included more internally-focused descriptions, such as opening to deeper emotions, feeling embodied 'off the mat', and two explicit references to meditation.

As noted above, the yin style of class was the most popular in the participant sample; yin being a grounding yoga style that predominantly features seated, prone, or supine postures held for at least one to two minutes to facilitate a deeper (fascial) stretch¹⁶⁷,

¹⁶⁶ Researcher's abridged quote from self-reflection (on p. 7 of thesis; section 1.2.1).

¹⁶⁷ Low lunges can be included, which provide the opportunity for a more intense held posture, but the emphasis is still on staying low to the ground and, where comfortable, closing the eyes.

usually practiced with the eyes closed or resting the gaze in a relaxed and fixed state. A yin style of practice provides an opportunity to pause within a posture and focus on sensation, rather than a busy mind. None of the participants identified yin as a meditation practice. An interesting finding, given that the researcher's own perspective (as a yin teacher) is of yin emphasising both interoception and meditation, via a quieting of the mind; a perspective borne from practice and from class attendees reporting a meditative experience. The range of meditation styles recorded by participants was primarily separate to their noted postural practice styles, aside from the three participants who recorded their meditation practice as a component of the class(es) they attended.

The findings can be explored through the categories of influence described as five 'active components' of a holistic movement practice by Vergeer and Biddle (2021). The authors components do reflect participant themes. For example, the mind-body theme would equate to physical practice and mental engagement, whilst the practice category within this study's findings captured themes relevant to Vergeer and Biddle's (2021) 'practice location', i.e. access, and home versus studio. Yet, theme fluidity across the categories highlights how subjective experience and compartmentalisation do not always align (as for the process of IPA). For example, the practice component data is defined as physical practice by the authors, whilst the focused attention and presence noted in the findings fits with mental engagement. Though community would fit the psychosocial label, to capture the 'motivational climate' and 'social interactions' of the yoga community; and although philosophy did not feature prominently within the data, it was an influence in the context of progression of practice.

The components proposed by Vergeer and Biddle (2021) do provide a systematic tool by which to categorise the ingredients that may be selected for an individual movement practice 'recipe', for studies designed to tease apart the influential components. Yet, the interaction of these ingredients at an individual level, especially in the context of health behaviour, which can in turn be influenced by multiple individual (internal) and societal (external) factors, does limit the utility of studying the contribution of 'active components' versus the practice in its entirety. This thesis points towards the study of a holistic practice from a holistic perspective, wherein the experience of the practice effects, and any consequent health habits that the practitioner adopts after committing to the practice, is a research topic with the potential to inform health promotion strategy from an experiential paradigm.

5.3 Thematic narrative: The experience of a lived practice

Two broader concepts relate to the experience of practice ‘off the mat’. The first, self-regulation, is the overarching concept guiding the thesis, with self-regulation considered in the context of pro-health habits (diet and exercise). The second, mindfulness, is a concept that features across holistic movement and contemplative practice research, and, in more practical terms, is a common term referenced within yoga classes. This section will then move from the broad to the specific, with the findings considered as group experiential concepts, or participant constructs (Smith et al., 2022). These concepts will be explored from the external to the internal experience, though the holistic experience of the practice often incorporates a milieu of both internal and external.

5.3.1 *The experience of self-regulation*

Looking at self-regulation from a motivation perspective offers an interesting access point to the findings. Recommendations proposed by Forestier et al. (2022) to enhance self-regulation research include the use of motivational conflicts, such that participants’ specific goals, or motivators, are taken into account. The authors illustrate this with an example of testing self-control in relation to diet by the use of participants who actually want to eat healthier. In other words, studying regulation fatigue, and conversely regulation endurance, within a context that participants are emotionally engaged. This fits well with this study’s participants, who were fully engaged with their yoga practice, and with Baumeister and Vohs’ (2018) assertion that self-control depletion is reduced if the choice aligns with one’s preferences. In this respect, is there less motivational conflict in relation to being active and eating healthier?

What did emerge from the findings was the stimulus of yoga to inspire the intake of food that would support participants’ practice, i.e. not partaking in any food (or alcohol) that would negatively affect practice and/or how participants felt during class. This does affirm the idea of the practice promoting a pro-health diet, i.e. there is no motivational conflict between the practice and diet. Both facilitate each other and would thus equate to Quirin et al.’s (2021) effortless self-regulation. This explanation best fits the data versus the idea of a yoga practice training willpower, given none of the participants explicitly used this term. Furthermore, applying Forestier et al.’s (2022) model of self-control fatigue, the

motivation to feel good during practice encouraged pro-health dietary choices, whilst the mind-body descriptions and references to increased energy from yoga provide subjective evidence of neural self-regulatory pathways and energy resources respectively. More specifically, examples of yoga either reducing cravings or prompting a desire to eat a balanced diet are suggestive of a downstream influence from the practice.

The increased embodiment, or interoceptive awareness, gained through practice tenure, enabled a more body-centred approach to diet, i.e. informed by how the body felt. This fits with Roche's (2018) suggestion that self-regulation and an embodied mind may interrelate, and to Cook-Cottone's (2016) 'embodied regulation' as a felt sense of being self-regulated; depicted in this study's findings as a neutral zone, less driven by thoughts and emotion. A potential link between interoception and self-regulation featured in the literature, with behaviour change motivated by a mind-body drive towards homeostasis (Strigo & Craig, 2016). The participants were inspired to move 'off the mat' as a result of feeling more energised from practice, with an additional narrative around yoga facilitating other movement modalities through strength and mobility gains, and even enhanced breath capacity. This relates to Cramer et al.'s (2019) findings that equated additional exercise 'off the mat' to practice frequency, though frequency was not a key practice component in this study aside from the experiential data regarding a commitment to the practice itself (see Section 5.3.4.1 on adherence). Two recently published papers add to this narrative. In the first, embodied self-regulation was experienced by the Ashtanga practitioners in Ramirez-Duran et al.'s (2022) study, who described an embodied sense of wellbeing that included moving and 'eating well'. Secondly, feeling connected to the body has been shown to be positively associated with physical activity levels (Paulson & Greenleaf, 2022¹⁶⁸).

To further illustrate the wide range of experiences that sit comfortably under the umbrella of self-regulation, the descriptions of balance as emotional regulation, or an experience of balance between body and mind, differed greatly from an experience of the practice balancing either sedentariness or other modes of activity. Furthermore, the experience of yoga as a 'reset' to return to balance provided a glimpse into a specific example of self-regulating via the practice, including using the practice as a setpoint for the day, e.g. starting the day in a (more) positive mental and/or physical state.

¹⁶⁸ In a U.S. study of women aged 40+ years (n=112; mean age 63.6-years). The embodiment survey was part of a wider study that included weight bias, exercise motivation, and exercise avoidance (Paulson & Greenleaf, 2022).

Equanimity is a useful construct to encapsulate both the experience of mental or emotional balance and/or a self-regulated response to external situations. One metaphor within this study's findings described 'surfing' through life; eloquently portraying a visual interpretation of a regulated, or balanced, state from which to respond to the changing surf. Equanimity also featured in reference to workplace dynamics and yoga being 'essential' to remain equanimous (from a participant with a tenure of four to six years). This contrasts to Wiese et al. (2019), who found equanimity was only reported as a practice outcome after a tenure of 10-years. To add a layer of complexity, equanimity was not a term chosen by the participants, but was included within Wiese et al.'s (2019) study as one of the multiple choice questions¹⁶⁹ that explored a range of mental/emotional benefits from yoga.

Self-regulation also captured findings associated with the application of yoga within participants' daily lives, including: the use of breathwork (*prāṇāyāma*), and returning to the present moment in response to, or during, challenging situations. It would have proved useful to clarify what participants meant when they referred to using the tools of yoga, as this may have been a reference to yoga philosophy guiding behaviour, for example in the context of diet (Cramer et al., 2019; Mace & McCulloch, 2020, 2022). The application of yoga was experienced by practitioners with a range of practice tenures, including new practitioners, and thus the experience of self-regulation 'off the mat' was not indicative of tenure. Adherence to the practice was informed by the experience of positive outcomes, being inspired by a sense of community, and by participants' knowledge that lacking motivation was a sign that they needed to adhere to practice. The question of whether participants practiced when they didn't feel like it, offered insights into adherence in the absence of optimal motivation; a topic explored in section 5.3.4.1.

5.3.2 The experience of mindfulness

A question raised by the researcher in the Introduction was whether a yoga practice could facilitate mindfulness in participants. A number of related themes emerged from the data, namely: perspective 'off the mat', self-awareness, progression of practice, and attention. Lived examples of mindfulness included reference to actively being mindful during everyday scenarios, and more specifically, to being present, e.g. being in the 'here

¹⁶⁹The multiple choice option available for selection (if applicable to the respondent) was: React with equanimity in difficult situations.

and now'; one of three aspects of mindfulness that has gained the most popularity (Lomas, 2016). A varied application of mindfulness 'off the mat' is consistent with the findings of Cox et al. (2021). Mindfulness was described as focusing, going inward, and accessing a quiet contemplation. More implicit descriptions, i.e. less active, included a non-judgmental attitude, and an acceptance of life (and one's physical body) as it is. Acceptance being an example of mindfulness in action, or "a process of relating openly with experience" (Bishop et al., 2004, p. 233). Other mindfulness concepts included letting go and/or releasing expectations.

A desire to progress to a more integrated practice, or to increase the meditative component of practice, were both examples of practitioners' developing their practice over time. A greater emphasis on meditation may reflect a transition towards a more spiritual or philosophical approach to the practice. Within the literature, a definition of spirituality¹⁷⁰ that offered a useful representation of participants' experiences was the integration of contemplation into the practice (Sarbacker, 2014). The literature also described an increased focus on spirituality both with increased practice tenure (Cagas et al., 2022b; Park et al., 2014); in relation to practice frequency (Cartwright et al., 2020; Csala et al., 2021); and as practitioners commit to the practice and/or transition to the role of yoga teacher (Sarbacker, 2014; Wiese et al., 2019). Some teachers in the study were not actively teaching, with one reason being that the training was purely for the progression of their own practice. Similarly, a desire to progress towards more 'self-designing' of the practice was representative of a journey towards being a devoted practitioner, rather than a teacher to others. Liu et al. (2021) described a bidirectional journey from practitioner to teacher, and potentially a return to practitioner status when the role of business perhaps clashed with the sense of devotion to the practice. Whilst business ethics did not feature, a sense of devotion and commitment to the progression of practice was evident.

The findings did not support an increase in spirituality according to teacher status, tenure, or practice frequency, with the caveat that the survey did not include a specific prompt on this topic. Referring back to the Buddhist lineage of mindfulness, being drawn towards spirituality —or more specifically, towards "spiritual progress" (Lomas, 2016, p. 4) — adds in a further aspect of mindful awareness. Explicit reference to spirituality within the findings emerged, with descriptions of a spiritual dimension to life, or the development of 'spiritual benefits', such as patience; benefits which acted as a motivator to prioritise the

¹⁷⁰ An alternate definition of spirituality that can encompass holistic movement and contemplative practices is discussed in Section 5.4.

practice, i.e. facilitating adherence. This particular motivation may be more accessible to those practitioners with a meditation practice¹⁷¹. Other descriptions offered examples of an ‘applied spirituality’ whereby yoga had infused participants’ lives with a feeling of spirituality (or universality), or provided a distinct experience of spirituality.

A point worth emphasising is that mindfulness, within yoga, does not necessarily equate to seated meditation. Yoga can be experienced as a ‘moving meditation’ or ‘mindful movement’. Indeed, one ‘non-meditator’ shared that yoga provided the opportunity to practice being mindful, and two described the emergence of a spiritual side to their practice experience, indicative of subtler outcomes purely from the movement practice. The fact that the physical postures are the third limb of yoga suggests that a practitioner first develops attention through breathing with movement, and during postural holds — the pause within movement — before progressing towards focus within the stillness of meditation. Returning to a translation of *sūtra* 1.2: “Yoga is directing and containing the activities of the mind.” (Roy & Charlton, 2019, p. 14). The authors emphasise that to quiet the mind, one must cultivate attention or focus, rather than attempt to stop the busyness of thoughts. In other words, a practice of re-directing the mind facilitated by movement. As Sarbacker (2014) noted (in line with the findings) the entry point to the practice can be the physical body, which is the locus for expanding towards a spiritual dimension.

5.3.3 Moving from the external to internal practice

The experiential concepts that emerged within the findings are now presented, to capture the range and depth of the participants’ lived practice experience, loosely ordered from the more external descriptions to the internal. A representation of the experience of the practice in the context of the eight limbs — as outlined in the Introduction — is provided in Figure 7, accompanied by participant themes. This is purely a visual interpretation of the findings aligned to the *sūtras*, and is not indicative of a progression from limb one to eight. Indeed, a practitioner may start with meditation or have no interest in philosophy. The practice may, for instance, jump from limb to limb (in no particular order) and may focus on one particular limb depending on the needs of the practitioner,

¹⁷¹ The practitioner who experienced spiritual benefits as a motivator to prioritise their practice, did incorporate meditation in their practice.

their access to the practice, and life circumstances. Most likely, a practice will involve several limbs at any one point in time. For example, a meditation retreat would require a focus on the internal limbs, but potentially also include the first two philosophical limbs, and the breath focus of limb four. The following experiential concepts are designed to highlight the participant narrative and offer a deep dive into the practice effects emerging within and across themes.

5.3.3.1 The embodied breath: Every situation is just breathing into it

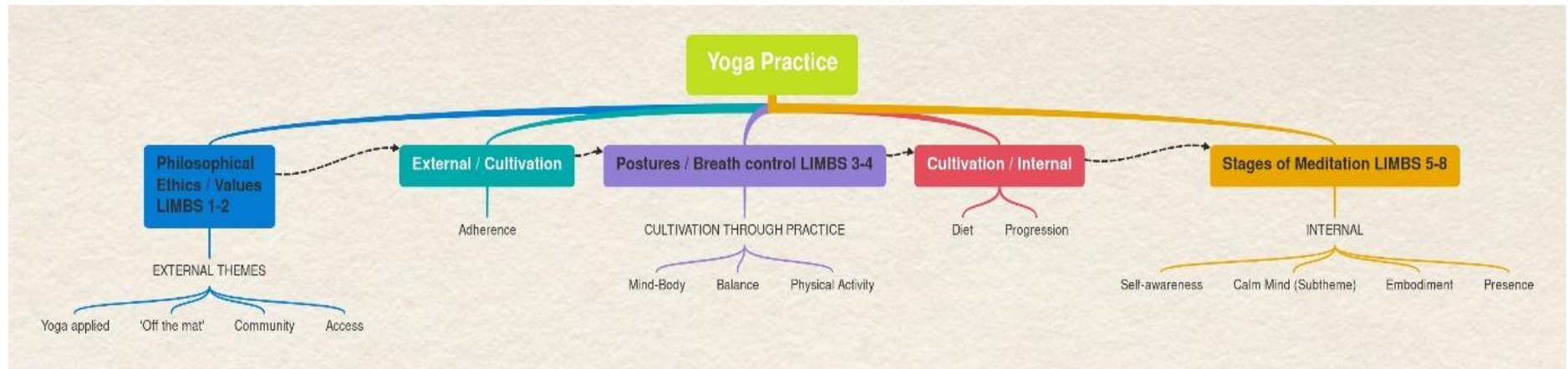
Prāṇāyāma, or breath practice, is an aspect of practice uniquely related to self-regulation, given that it may be a key to yoga's relationship to the PSNS (Thayer & Sternberg, 2006). An embodied, felt sense of the breath was described alongside the awareness of breath in daily life, including the conscious application of breath focus to manage stress. Downregulation of the nervous system, or a parasympathetic shift, via breath awareness, is a possible physiological explanation for the ability to better manage stress (Saoji et al., 2017; Zaccaro et al., 2018). Descriptions included exhaling what was no longer necessary, such as held tension; being able to pause or slow down; or to scan the body and attune to sensation. All of which offer illustrations of a life lived from an embodied perspective.

5.3.3.2 Yogic filter: Yoga has changed myself and how I interact with the world

Another pattern within the findings was the practice acting as a filter 'off the mat'. Yoga had changed the lens through which participants viewed their lives, adding a 'yogic filter' that altered the short-term (post-class experience) and long-term (expectations or life view) perspective. One such experience described as the "*internal space ... [influencing] one's view of the outward world.*" The practice went beyond the participants to influence their relationships with others; akin to the transition from intra to interpersonal relationships identified by Kishida et al. (2018a). The addition of a spiritual dimension to life was not a major theme, but did feature in the context of cultivating patience and calm, and the experience of an integration of the 'facets' of being human; both of which provide more evidence of yoga's mind-body influence, and are supportive of Wiese et al.'s (2019) deduction that improved social connections may arise from an expanded relationship to

Figure 7

The eight limbs of practice



oneself. As one survey response illustrated: The practice facilitated a “better relationship with myself and those around me”. Of note, the experience of being an ‘integrated human’ echoes the words of Judith Hanson Lasater (personal communication, October 24, 2017); words that are particularly apt given their specific reference to how an integrated person would embody the first two limbs of yoga (relationship to others and to oneself).

A repeated narrative, or common thread across the findings, was a shift in mindset, particularly towards acceptance (of self and circumstance); a mindfulness concept noted prior. Examples included a sense of yoga ‘putting life into perspective’ and also enlivening the experience. As one metaphor clearly illustrated: life had shifted from a two dimensional experience to “3D” with “more shape and colour”. The practice itself was used for the explicit purpose of a mindset shift, e.g. to relieve a low mood, or reset after a tough work day. Though the environment, or social construct, within which yoga sits may be colouring participants’ own experiences of yoga as a self-regulatory tool, e.g. a self-care practice to recover from daily stressors (Hauser, 2021; Shaw & Kaytaz, 2021). Again, the embodied self-awareness or ‘yogic perception’ highlighted by Funes Maderey (2018) fits with the experience of noticing mental and physical shifts, both as a result of practice and in response to external situations. The 3D metaphor noted above seems an apt expression of an embodied perception cultivated through practice, providing a sense of a heightened awareness of the ‘shape’ of the internal landscape. The descriptions of directing an external action from an embodied internal space within this study’s findings provide yet more qualitative evidence for a ‘yogic perception’ cultivated through practice, as denoted in the literature with respect to a changed perspective to dietary behaviour (Ross et al., 2016). A change in mindset, or ‘a better frame of mind’ from which to make health decisions was specifically noted by Ross et al. (2016), and matched in this study’s findings, indicative of emotional self-regulation.

The releasing of expectations seemed particularly influential in responding to external factors. Though it can equally improve the internal environment, as denoted by the release of expectations placed on oneself and the practice, and letting go of held emotions or a sense of fighting circumstance. Given that acceptance, releasing expectations, and letting go, are all mindfulness concepts (noted in the previous section), the findings were indicative of a shift towards a more mindful mental state. The language of acceptance and ‘letting go’ flows freely through current Western yoga offerings. To demonstrate this, a search for classes using these terms was undertaken on a popular international online

yoga platform¹⁷² that has expanded in the COVID-19 era to incorporate different modalities of movement, such as strength and high-intensity interval training. For acceptance, the search resulted in 26 classes of yoga and meditation, whilst 'letting go' offered 51 classes. Interestingly, a search for 'perspective' resulted in 70 classes that included options to shift perspective via yoga *āsana* or meditation, or a class themed towards a mental shift, e.g. at the start of a new season or year.

Reflecting back on the published literature, Sala et al.'s (2020) meta-analysis of a mindful approach to health behaviours 'off the mat' (or rather 'off the meditation cushion'¹⁷³) found that 'acting with awareness' was the central facet of mindfulness predictive of pro-health actions. Again, a theory that fits with that of Roche (2018) whereby awareness is linked to self-regulation. It seems reasonable to predict that acting with an embodied awareness (a 'yogic perception') would improve the chances of self-regulating. In the context of diet, the findings equated practice tenure to an attunement to the felt sense of certain foods, i.e. an embodied perception, which in turn guided diet. This internally driven motivator towards a diet that was 'healthier' or 'lighter', or at least a diet that did not restrict the practice, corresponds to Cook-Cottone's (2016) 'embodied self-regulation'. Using this embodied self-regulation perspective, a closer look at the findings revealed that in terms of awareness of interoception, the MAIA mean scores (noticing, emotional awareness, and body listening¹⁷⁴) for the non-meditators did not differ from those participants who meditated. Thus, participants' interoceptive awareness was not dependent on a meditation component of practice. At first glance this would appear to contrast with Van Gordon et al.'s (2021) 'focused observation' as a result of contemplative practice, but is potentially an indication of yoga providing access to contemplation without the requirement for a specific (seated) meditation practice. In other words, the development of an embodied awareness through movement that provides an alternative route to contemplative focus.

An interesting finding was that over 80%¹⁷⁵ of non-meditators felt that yoga facilitated other movement modalities, i.e. those practitioners who had a movement-focused yoga

¹⁷² The online search was conducted in January 2022. The online yoga platform declined permission to be cited (in an email response received 18 February 2022).

¹⁷³ Less than 4% of the studies within Sala et al.'s meta-analysis recorded yoga practice data.

¹⁷⁴ Body listening was slightly higher in meditators, but only by a score of 0.32 so realistically inconsequential. The two outliers who scored low for body listening can be discounted in this instance as there was one each in the meditator/non-meditator subgroups.

¹⁷⁵ Non-meditators (n=9/11) who did consider their practice supported them (in response to the survey question: Do you feel that your yoga supports you to be active in other ways?)

practice were motivated to move in other ways 'off the mat'. Movement facilitated movement, in contrast to diet. Over half¹⁷⁶ of the non-meditators responded in the negative to the question of the practice supporting their diet (versus just over a third of all participants). This would be an interesting topic to study in more detail, i.e. whether inclusion of interoceptive guidance specifically aimed at 'off the mat' behaviour change would improve pro-health outcomes. For example, a focus on the sensations of the gut to positively influence pro-health dietary decisions. (See Sec 5.6 for further thoughts on future research).

5.3.3.3 Grounding

Embodiment engendered a feeling of being grounded, or of 're-grounding'. A concept denoting the felt experience of connecting to the body, feeling settled and returning back to a 'being' state (also linked to 'return to self', to follow); descriptions that support Kishida et al.'s (2018a) findings. Embodiment was a resource that enabled a more equanimous or considered response to external stressors; a response also supported by pausing (again to follow). The experiences of embodiment had parallels with attention, with the practice experienced as a space to focus on the body, to go inwards, slow down, and hone awareness of sensation. Having a resource to cope with stress engendered self-agency, though the experience ranged from the spiritual (sensing connection to the Universe) to the practical (setting oneself up for the day with yoga). The researcher's personal experience of grounding through practice has been enhanced by visualising the connection to the ground beneath and widening the perception of space to incorporate the natural surroundings beyond the mat. Interestingly this grounding experience did not feature in the data, and was not followed up within interviews to restrict any researcher influence on the descriptions. Rather this contrast of meaning assigned to 'grounding' was noted by the researcher in reflections (both post-interview and during the qualitative coding).

This point of difference is representative of the findings being unique to the participants; experiences encountered by the researcher (and the reader) who have their own embodiment lens. For this study, the practice itself was the grounding tool; grounding participants back into their own bodies, providing a sense of ground that enabled freedom

¹⁷⁶ Non-meditators (n=6/11; 54.5%) who did not consider their practice supported their diet (in response to the survey question: Does your yoga practice support you in your dietary choices?)

or detachment from thoughts. Perhaps a glimpse of the experience of 'yogic perception' as a freedom from a "limited conception of one's own embodiment" (Funes Maderey, 2018, p. 270) to one of 'embodied self-awareness' (as noted above). From the researcher's own perspective, a metaphor that fits this experience is the body as an anchor point for awareness, to free (or release it) from the thinking mind.

5.3.3.4 Return to self: Yoga just helps me get back to me

The lived language of embodiment expressed within the findings offers insight into yoga's influence, and can be interpreted from different angles. For example, the experience of 'returning to self' was an experiential concept shared across themes. Returning to self could be capturing the experience of returning to sensation in the moment, i.e. a return to presence, expressed as getting back into your own skin. Or it may be an experience of self-awareness or noticing the 'self' in the midst of daily life, such as a sense of 'being' oneself. An alternative interoceptive perspective is offered by Allen and Tsakiris (2019), who surmise that sensation, or indeed all visceral signals that are in communication with the brain, offer a moment-by-moment estimation of the self; or a sense of "self-stability" (p. 36). This is a useful definition of the experience of feeling oneself as a body, and identifying oneself as a 'being' connecting with the external world through a body. Although the border between internal and external space is subjective and contextual. For example, noticing the 'energy of a room' can feel like an extension of self beyond the body, or conversely, like the external energy is crossing to the internal.

What stood out from the findings, was an embodied quality to this concept, whereby yoga returned participants back to themselves, with statements describing a coming home after practice, and a feeling of being 'at one' that yoga had enabled¹⁷⁷. Returning to a state of embodied presence seems to best fit the narrative; again illustrating the mind-body influence and, as for the grounding concept, revealing an experience analogous to Patanjali's 'embodied self-awareness' (Funes Maderey, 2018). In the context of self-regulation, Roche's (2018) theory posited that an embodied mind, specifically one that is aware of, and accepts, the transience of the present moment, is a state supportive of self-regulation. In other words, returning to self enables embodied (or self-informed) actions. From personal experience, the researcher can attest to a feeling of being more regulated

¹⁷⁷ To give context, the actual survey response was: "[Yoga] has shown me how to be at one with myself ...".

post-practice; though this too can be a transient experience depending on the stressors of the day.

5.3.3.5 The pause: On the other side of class is my real self

The ability to pause was an emergent theme across the data, either in the context of the practice being a pause amidst life, or, at a more refined level, the pause between postures or the pause at the end of an exhalation. The opportunity to pause does provide space to slow down and potentially access self-awareness, either simply by dropping attention into the body (embodiment) or being an observer of the mind's thoughts rather than attaching to them (mindfulness), and thus opening to a sense of a separate self (as the 'real self' in the heading alludes to). Self-awareness can be considered a space from which to notice the impact of yoga on the response to internal and external stimuli; or as one interpretation of the *sūtras* proposes, the concept of this space as 'giving room' to be embodied (Funes Maderey, 2020). Consequently, the pause can be a tool to self-regulate between stimulus and response, described as being more conscious (or present) when making decisions, being less reactive, relaxing in the pause, feeling into emotion, and even providing space for compassion when challenged. Responding to external pressures in a mindful way, and having an awareness of the mental narrative, featured as themes in Cox et al.'s (2021) study.

The internal landscape category captured descriptions of an explicit awareness of an internal process, such as noticing a 'mental yoga practice' in play 'off the mat', or 'living beyond the veil', a metaphor that may represent the lived experience of Funes Maderey's (2018) 'yogic perception'. The pause also experienced as an opportunity to become embodied and regulate accordingly, e.g. to scan the body for tension, and to hone attention. In particular, the contextual 'pause from life' to practice was experienced as a space to focus inwards, and realistically to regulate from a space of awareness: to 're-ground, re-group and re-focus'¹⁷⁸. Funes Maderey (2020) offers a phenomenological (reflexive) interpretation of this embodied spaciousness using the commentary within Patanjali's *Yogasūtra*, whereby Vyāsa (the first 'narrator', noted in the Introduction) uses a metaphor of space (*ākāśa*), with the suggestion that the experience of space is the interoceptive quality of an "embodied self that knows itself through its movements." (p.

¹⁷⁸ Participant quote abbreviated.

301) From this perspective, the embodied space is descriptive of the mind-body conversation between interoception and embodiment (the *experience* of interoception), with the ‘experiencer’ being awareness or the self. Whether it is this awareness that is experienced as space is an interesting inquiry.

5.3.4 Pro-health habits: Yoga opened that door

The interrelationship between behaviour and habit is rooted in consistency, thus pro-health habits result from the consistent application of pro-health behaviours (Smith & Graybiel, 2016). The literature suggested that automaticity (efficiency) and adherence co-exist (Rhodes & Sui, 2021). Indeed, habit did feature within the findings with the practice compared to simply brushing your teeth or getting out of bed, i.e. an automatic act that you “just kind of do” without the need to consider options. The automaticity or habitual nature is borne out of repetition, facilitated by a context that supports the desired behaviour, or a “goal-conducive context” (Williamson & Wilkowski, 2021, p. 19). Perhaps, rather than practice frequency being the measure of consistency, the commitment to the practice itself, the environment within which the practice (and pro-health behaviours) take place, and the identity formed ‘on the mat’ are all acting both separately and in combination to create a yoga adherent. Self-identification itself can influence behaviour (Quaye et al., 2021; Rhodes & Sui, 2021). Campeau-Bouthillier’s (2021) interpretation of yoga as a ‘health practice’ offered an insightful perspective of practitioners’ experience of the practice as a health-improvement project. The findings suggest that self-regulation is established in the early stages of tenure, in practitioners who resonate with, or are committed to, yoga¹⁷⁹; a finding consistent with Wiese et al. (2019) who found that tenure did not dictate outcome¹⁸⁰. Equally, the early phase of habit development, may be an influence on self-regulation in practitioners at the start of their practice tenure. As Kaushal et al. (2017) found (in a study of gym/fitness centre members), behaviour that enabled the transition towards (metaphorically) ‘getting on the mat’ was correlated to consistency of practice.

Looking at the findings in respect to consistency, the practice itself emerged as a consistent behaviour. The simple fact that yoga is considered to be a ‘practice’ may

¹⁷⁹ The fact that participants self-identified as yoga practitioners (with yoga being their primary movement practice) is evidence of their commitment.

¹⁸⁰ Wiese et al. (2019) noted similar outcomes in practitioners with a tenure of up to 3-years and those with a >10-year tenure.

facilitate consistency. Practicing suggests a learning environment, and learning requires repetition, i.e. regularity or consistency, and a commitment. Indeed, Patanjali's Yoga *Sūtra* 1.14, as translated by Shearer (1982) suggests that a consistency and commitment are essential to the practice: "The practice of yoga will be firmly rooted when it is maintained consistently and with dedication over a long period." (p. 92)

Even the Sanskrit for practice, *abhyāsa*, can be translated as "diligent practice, the effort to stay with something" (Roy & Charlton, 2019, p. 319), i.e. commitment. Shearer's (1982) understanding of a 'firmly rooted' practice is one that can counterbalance a fluctuating mind. But if a behavioural science lens is applied to this translated *sūtra*, it could equally be asserting that the practice will become a habit with consistency and dedication. A perspective that fits with Roy & Charlton's (2019) more recent *sūtra* 1.14 translation alluding to the establishment of a habit: "[Practice¹⁸¹] takes a long time, needs to be consistent and performed with integrity and enthusiasm before it is firmly established." (p. 86).

It is interesting to see enthusiasm in the above quote, in place of dedication; this subtle change in nuance evoking the literature on enjoyment and adherence (Calado et al., 2022; Conner & Norman, 2021; Rhodes & Sui, 2021; Teixeira et al., 2022; Van Cappellen et al., 2018). Looking at behaviour change through an enjoyment lens could support adherence to health promotion interventions, if — as the authors assert — they are specifically targeted towards facilitating a positive affect towards the pro-health behaviour. Or, conversely, if an individual's preferences and their level of self-efficacy are understood. The variety of experiences expressed in this study demonstrate the subjective response to yoga, and the adaptability of the practice to suit the preferences of the practitioner. Perhaps one explanation for an adherence to yoga, is the cultivation of a subconscious motivation to practice, a motivation that, as Van Cappellen et al. (2018) assert, strengthens over time as each recurrent enjoyable yoga session subtly shapes how the practitioner feels about their practice.

¹⁸¹ Practice has been inserted in the quote in place of the author's use of the Sanskrit term (*abhyāsa*): defined by Roy & Charlton (2019) as 'diligent practice, the effort to stay with something' (p. 319).

5.3.4.1 Adherence: A day that starts with yoga

A home practice (and teacher status) did facilitate the practice, but being part of a yoga community offered a supportive context to adherence. The sense of community provided a safe space within which to practice (and experience emotions), but the main influence was in supporting adherence to practice, with descriptions of gaining energy from the group — a synergy — or simply feeling more motivated to practice amongst others. The experience was one of a community of like-minded people; a social group with similar interests, where participants felt welcomed, supported, and inspired. As Cheshire et al. (2022) noted, social cohesion can support adherence. Aside from the supportive context of the studio environment, other factors facilitating adherence were the attraction to yoga philosophy (that related to desires to progress the practice), and expected outcomes of practice. Adhering to yoga over time — and re-engaging time and again within a context of yoga, whether that be external (e.g. studio) or internal (e.g. applying philosophy ‘off the mat’) — creates the habitual practice, and potentially facilitates additional pro-health behaviours that translate into habits.

One of the key markers of commitment within the sample was practicing when they didn’t feel like it, with only 5% not getting on their mat, surprisingly from practitioners with a tenure of at least 10-years. Perhaps their long-term experience enabled them to sense when practicing may not be their best option, e.g. connecting with friends, resting, or moving in the fresh air may have felt more responsive to their needs. Again, clarification would have proved useful here. The positive responses included commitment to the discipline of practice, and practice frequency emerged within the experiential data on commitment. A commitment to the yoga in the long-term, with an acceptance that the practice may ebb and flow¹⁸², is an experience shared by the researcher. Indeed, the exact phrasing used in one quote — “I know that practice ... will help connect me back into myself or ground me” — speaks to the researcher’s own practice of grounding through yoga as needed.

A commitment to practice regardless of affect is a notable finding, that essentially protects the practice from waning motivation, resulting in a more resilient habit. One behavioural study¹⁸³ (n=126; 48.4% female; mean age 27.4-years) published after the

¹⁸² Kristal et al. (2002) noted that tenure does not necessarily equate to a consistent practice, with the ebb and flow labelled as an ‘abbreviated’ practice.

¹⁸³ The paper used data from a larger study exploring personality, context, and stress, that was undertaken in the U.S. (between 2016 and 2018), though the accessed data was from participants

literature review adds to prior research supporting a relationship between affect and physical activity, with the added nuance that affect may have the strongest impact on exercise after approximately 8-hours (Ruissen et al., 2022). In simple terms, how one feels can predict what exercise you may undertake 8-hours later. Thus, practitioners who choose to practice regardless of how they feel not only commit to their practice but, by potentially shifting their mood through practice, may also positively impact their activity levels several hours after leaving the mat.

Access to a studio, either close to home or on the work commute facilitated adherence, as did individual strategies such as practicing at the start of the day, i.e. before life commitments could potentially impact plans, or preparing for class the night prior. Having the funds to attend classes featured amongst the sample, an issue that has potentially been reduced by the proliferation of online content since COVID-19 emerged. A narrative that stood out was the knowledge of the beneficial post-practice effects being the motivator to adhere to the practice, indicative of a positive self-regulatory feedback loop where the practice supported ongoing adherence. Outcomes including the alleviation of stress, anxiety, and depression were noted to be adherence motivators by Penman et al. (2012). The experience of applying yoga within the context of stress management featured across the data, consistent with yoga industry findings in the USA (Yoga Alliance & Yoga Journal, 2016). Thus, further evidence for the practice as a self-regulatory tool and potentially a keystone habit — as espoused by Duhigg (2014) — facilitating additional self-regulation.

Given the relevance of consistency to habit formation, it was interesting to note that practitioners' perceptions regarding whether their practice supported them to self-regulate 'off the mat' — with respect to being active and food choices — were inconclusive when it came to practice frequency. This contrasts with the literature that found evidence of practice frequency being a key factor in relation to health (McKinney, 2020; Wiese et al., 2019). Overall, in this study it was found that yoga did support other movement, irrespective of tenure or frequency, with the majority responding in the affirmative to the survey question: 'Do you feel that your yoga supports you to be active in other ways?' This fits the shared experiences, such as enhanced energy levels and physical preparedness resulting from practice. Yet the picture was not as clear regarding dietary choices, with a third not feeling supported by their practice. The only hint of a trend (within this subgroup)

recruited later in the protocol, after inclusion of a smartwatch to record activity levels (Ruissen et al., 2022).

being that over a third had practiced yoga for at least 10-years. In fact, one could argue that the greatest gains were experienced in newer practitioners (with <2-years tenure). The greater shifts experienced in the early stages of practice tenure were most likely due to the establishment of novel approaches, e.g. making a 'conscious choice' to eat healthier (in the first year of practice) prior to the development of unconscious habit formation. The yoga was identified as a facilitator in a relevant example, prompting the practitioner "to think more about ... natural foods". The body/mind response to a change of diet is likely to be most noticeable, i.e. felt more acutely, during the initial phase of implementation versus having an awareness of incremental change over a longer period of time, i.e. years of practice tenure. This raises the question of whether long-term yoga practitioners have perhaps already established, or optimised, their pro-health habits such that their yoga is no longer required as a self-regulatory support. Or practitioners may have internalised their habits, and coincidentally their practice, such that they no longer made a conscious link between the two.

The study's findings provided examples (irrespective of tenure) whereby the feedback loop had been reversed. Foods were selected due to their positive impact when practicing, i.e. diet supporting the yoga. For example, in order to not feel too full during practice, or by limiting alcohol the night prior to a yoga session. Experiences illustrated a positive self-regulatory loop whereby a healthy diet facilitated practice, and the practice motivated participants' choice of food before and after class. The main influence on diet was simply the practice itself. Whilst diet was discussed in relation to yoga philosophy in the literature, the concept of *ahimsā* and plant-based dietary preferences did not feature in this study's data. Participants simply shared their decisions, such as 'eating clean', ethically sourcing food, choosing to reduce or avoid meat, reduce dairy, and eat more fruit and vegetables. Only one reference to veganism appeared, in contrast to Mace & McCulloch's (2020, 2022) findings, though these were specific to a UK-based yoga teacher sample surveyed on the application of *ahimsā* and meat consumption. Surveying participants directly on their dietary preferences, e.g. vegan/vegetarian/omnivore, would have enabled a comparison to the literature supporting a link between yoga and the non-consumption of meat (Cartwright et al., 2020; Cramer et al., 2017, 2018, 2019). Though Cramer et al. (2018) found a tendency towards pro-health behaviours in yoga practitioners, with or without meat consumption. The relationship between a holistic movement practice and compassionate behaviour, whether that be pro-animal or pro-planetary health, is becoming the focus of research as the climate crisis debate gains momentum. For

example, Loy (2022) asserts that yoga and meditation may instigate sustainable choices¹⁸⁴, via increased self-compassion and 'global identity' (denoted by the degree to which participants identified with humanity as a whole, and their sense of solidarity and/or desire to care for humanity¹⁸⁵).

Participant themes are mirrored in prior research, particularly Watts et al.'s (2018) study of young American adults, of which 90% considered yoga had a positive effect on their dietary behaviour. As for this study's findings, practitioners were motivated to eat healthier so as not to negate the positive feelings post-practice, and had increased energy for being active 'off the mat'; attunement also being a source of food regulation in Cox et al.'s (2021) qualitative research. In this study's findings, tenure did seem to have a more nuanced influence on diet, towards a more interoceptive sense, i.e. the felt experience of dietary intake. Increased awareness of the body's needs was developed through practice. A shift to an inherent motivation (to both eat better and move more) perhaps a sign of enhanced interoceptive, or embodied, awareness. A concept that was a dominant feature of section 5.3.3.

The more descriptive examples of additional exercise captured within the physical activity theme, e.g. being prepared physically and energetically (as a consequence of the practice) were suggestive of yoga promoting increased activity, as prior studies have shown (Cramer et al., 2017; Watts et al., 2018). However, if we consider the participants as a whole, it is possible to gauge where participants' activity levels sit in the context of current physical activity recommendations. Overall, the two cohorts had similar patterns of activity, with mean vigorous intensity levels at approximately 1.5-hours per week. Moderate activity was most prominent in the interviewees (at a mean of 3.9-hours per week) versus walking in the survey cohort (mean 4.7-hours per week). Participants met both the World Health Organization (WHO) guidelines (at 1.25 to 2.5-hours vigorous and 2.5 to 5-hours moderate activity), and the NZ guidelines (at 1.25-hours minimum of vigorous or 2.5-hours minimum for moderate activity) for weekly activity levels in healthy adults (Ministry of Health, 2020a; World Health Organization, 2020). Both guidelines go further to suggest aiming for 'extra health benefits' with 5-hours of moderate or 2.5-hours of vigorous activity, a level of activity surpassing the mean levels of the study's yoga practitioners.

¹⁸⁴ Based on a survey of 401 participants (71.3% female; mean age 42.5-years), half of which (52.6%) identified as mind-body practitioners (either yoga, meditation, or both) (Loy et al., 2022).

¹⁸⁵ Using a survey tool: Identification with all Humanity Scale (McFarland et al., 2012).

The health habits data was overall indicative of a population cognisant of their health, with a reduction in smoking, drinking, and transitioning away from meat congruent to a sample who self-identify as yoga practitioners. For example, sleep quality scored a mean of 4.68 out of 5 (with the top score denoting *a/ways* feeling rested on waking). A consistent sleep quality does mediate against any impact of disordered sleep on interoception (Ewing et al., 2017). Consistency of scoring may not be an accurate representation (see limitations in Sec 5.5.1), with a similar consistent high score for self-efficacy. Yet, a positive correlation between nutrition and exercise self-efficacy may be suggestive of a self-sustaining self-regulation whereby pro-health habits, and likely the self-identification of being someone invested in a movement practice, supports the continuation of pro-health decisions. As noted prior, self-identifying as healthy can positively influence self-efficacy with respect to pro-health actions (Quaye et al., 2021). Put simply, once a choice has been made to act in accordance with a pro-health identity, each additional decision is made within a pro-health paradigm. Identifying with the ‘self-as-doer’ is a useful concept offered by Brouwer (2018), in that it is an active identity, i.e. “*the doer*¹⁸⁶, of a behavior” (p.27), that links to intrinsic motivation.

An interesting finding with respect to self-efficacy was the correlation between both SES scales and the noticing aspect of interoceptive awareness; suggestive of both ‘embodied self-regulation’ and the embodied awareness or ‘yogic perception’ discussed earlier. Another point worth highlighting is that teaching yoga may impart a negative impact on the teacher’s movement practice (yoga and/or other exercise). Participants who identified as teachers were less confident in their ability to sustain exercise, perhaps due to the time and energy resources required to teach classes (as experienced by the researcher), though clarification was not sought.

5.4 Situating the study within the present day context

Yoga research is a subset of the holistic movement and contemplative practice research fields, and sits adjacent to the interoception/embodiment fields. Within contemplative practices, meditation and yoga can be incorporated within the same study, and it can be challenging to establish how much of a yoga practice is, in fact, meditation.

¹⁸⁶ Emphasis (italics) as per the quote.

Use of the term ‘holistic movement practices’ does offer a method of separating movement from purely seated practices (Vergeer et al., 2021). As Vergeer et al. (2021) note, movement is an essential component of these practices. The additional contemplative components within such practices, including an integrated yoga practice, can be identified as a subset within a participant pool in studies seeking to explore intra and inter-practice effects. The yoga *sūtras* placed meditation at the heart of a yoga practice, and depending on one’s viewpoint, is either the goal or the outcome of a regular practice. This study’s findings, in line with this philosophy, found that almost 70% of participants had a regular meditation practice. Yet, the experienced ‘off the mat’ effects were not dependent on the meditation component.

In the context of physical activity in New Zealand — and following on from the statistics presented in the Introduction chapter — the most recent participation survey by Sport New Zealand (2022b) showed that adult (n=22,823¹⁸⁷; 56.1% female; age 18+ years) weekly participation rates in physical activity had not changed from 2019 to 2021 according to age or gender, and Pasifika adults were the only ethnicity to be less active in 2021¹⁸⁸. Yoga participation had significantly increased by 3% from 2019 to 2021, with the authors noting that the COVID-19 pandemic may have shifted behaviour towards a more flexible approach to movement, quoting an example of choice of activity according to mood, and an increase in overall awareness of the positive impact of movement on wellbeing (Sport New Zealand, 2022b). How the pandemic may have changed barriers to participation was not stated, though the fact that lack of motivation or energy were two of the most prominent barriers to being active may relate to the social isolation of lockdowns (Sport New Zealand, 2022b). A 2021 Canadian survey¹⁸⁹ (n=1669; 82.4% female, 90.7% aged 18 to 65-years) similarly found that lack of motivation was a barrier to exercise during the pandemic, while motivators shifted towards a focus on mental health outcomes (Marashi et al., 2021). Potentially the shift to working from home may be one of the reasons why commitments were less of a barrier in 2021 noted in the Sport New Zealand (2022b) survey.

¹⁸⁷ Numbers relate to those participants who self-reported as being physically active in the prior 7-days (Sport New Zealand, 2022a).

¹⁸⁸ An impact of the COVID-19 pandemic identified by the report was a disruption to how those aged 5 to 17-years were able to exercise (Sport New Zealand, 2022b).

¹⁸⁹ The Canadian survey noted that the majority of respondents were in social isolation (for at least 4-weeks) at the time data was collated, with 37% working from home (Marashi et al., 2021).

Specific to the government restrictions imposed in NZ in the first lockdown of the pandemic (April 2020), a cross-sectional study of adults (n=4,007; 72.0% female; mean age 46.5-years) surveyed physical activity levels (via the IPAQ) alongside mental health and wellbeing using a variety of outcome measures, with participants providing details of their pre-lockdown (February 2020) versus lockdown exercise intentions, and results supporting the protective effect of exercise on mental health (O'Brien et al., 2021). In fact wellbeing was positively associated with physical activity levels after controlling for other factors, including sitting time (O'Brien et al., 2021). As the authors noted, a 'dose-dependent relationship' emerged between wellbeing and exercise. In Australia, an increased uptake in outdoor activities (walking, running, and cycling) was noted during the 2020 lockdown (versus participation data for the year prior), which Rothwell (2022) surmised was likely due to the fact that exercise was one of the limited options for being outside of the home (aside from shopping for essential items or seeking healthcare). Access to fresh air (and social contact) being the motivation amidst the shift to restricted lifestyles; golf being another popular pandemic pastime in Australia (Rothwell, 2022). These positive findings contrasted to those from a multinational online survey of both physical activity (again assessed via the IPAQ) and dietary behaviour (via a questionnaire developed specifically for lockdowns) in adults (also in April 2020) that highlighted the negative impact of the sedentariness borne out of home isolation orders (Ammar et al., 2020). The first subset of completed surveys (n=1,047; 54.0% female; 55.1% aged 18 to 35-years; 35.1% aged 36 to 55-years; 9.8% aged >55-years) reported a 24% decrease in overall exercise and a corresponding increase in sitting (28.6%), whilst increased snacking behaviour and a change to more unhealthy food choices was also evident (Ammar et al., 2020). Reduced exercise was also noted in a NZ study based on data from a national survey¹⁹⁰, which considered pre-pandemic adult activity levels versus four data points up to April 2021 (Wilson et al., 2022). The results (n=1854; 54.6% female; 58.0% aged 25 to 64-years) identified a sustained reduction in physical activity (Wilson et al., 2022). As the data for this doctoral study were collated in the pre-pandemic era (surveys June to October 2018; interviews December 2018), the findings are representative of a pre-pandemic perspective.

¹⁹⁰ The Active NZ Adult Survey uses the NZ electoral roll to sample adults (aged ≥18-years) (Wilson et al., 2022). Response rates declined by approximately 75% from April to September 2020, so results were based on participants who provided data at each data point (five in total) (Wilson et al., 2022).

The impact of COVID-19 on global mental health has had both negative and positive outcomes. A global survey by WHO (2022a) affirmed that the prevalence of anxiety and depression had increased by 25%, with mental health being added to pandemic response plans, yet chronic under-funding in mental health services — at an average spend of 2% of governmental health budgets — has resulted in demand outweighing supply. In NZ, help-seeking for anxiety and depression increased during the lockdowns, and the government is actively planning to respond to the secondary stressors, such as the economic and social impacts of COVID-19 (Ministry of Health, 2020b). Use of online and telehealth mental health and addiction services increased from 2020 to 2021 — including over 500,000 New Zealanders, or one in 10, visiting a national website providing support for depression¹⁹¹ — though access is not equitable, e.g. rural and/or older populations may face problems accessing technology (New Zealand Mental Health and Wellbeing Commission, 2022). On the positive side, the pendulum has shifted towards an increased awareness of the need to look after one's mental health, with the result that coping (self-regulatory) strategies such as mindfulness and 'self-care' have become widespread in their dissemination and use.

These positive and negative consequences were confirmed by a study that simply analysed global Google search trends pre-pandemic (Nov 2019 to January 2020), during the transition (February to early March 2020), and in the early phase of the pandemic (up to the end of May 2020), with a definite increase in yoga searches, alongside those for anxiety and depression (Jindal et al., 2021). Access to virtual applications, usually with a free trial (and on occasion simply offered free on request), creates the potential for self-regulation at your fingertips (with practice). However, these virtual tools can use a somewhat contrary narrative around productivity while working from home, or to enhance a company's performance (Ellis, 2021; Headspace, 2022). The need for individuals, where able, to access self-regulatory advice and practices, such as yoga, has arguably never been more necessary. More specifically, the pandemic has raised the awareness of the effectiveness of exercise to improve mental health. Marashi et al. (2021) found that a decline in physical activity was associated with a corresponding decline in mental health, and that depression was related to a lack of motivation to move, while anxiety could either act as a barrier to exercise or as motivator to relieve stress through movement. The WHO

¹⁹¹ <https://depression.org.nz/>

(2020) exercise guidelines are based on ‘moderate certainty’ evidence that physical activity improves mental health.

Online resources have advanced as a consequence of both global lockdowns and the need to reduce costs and improve the reach of services, whilst simultaneously limiting COVID-19 infection risk. Evidence of improved mental health through online interventions does support funding in this area. One such example being a short-term NZ/Australian waitlist controlled study (n=425¹⁹²; 69.9% female; median age 47-years) that took place prior to the pandemic (Przybylko et al., 2021). Notably, the 10-week intervention was focused on behavioural change through social engagement and improved self-efficacy with respect to diet (e.g. transitioning towards a greater emphasis on plant-based foods) and physical activity (such as 10,000 steps or 30-minutes moderate exercise daily) using positive psychology and lifestyle medicine principles, resulting in significant reductions in anxiety, depression, and stress at 12-weeks post-intervention (Przybylko et al., 2021). As the authors noted, providing supportive online educational interventions can enable self-regulation in individuals which has the potential to ‘buffer’ their mental health from the influence of life stressors.

In the context of yoga, a simple library search for titles incorporating ‘online yoga’ showed that in the 5-years prior to the COVID-19 pandemic (2015 to 2019) the number of articles was less (n=10 after duplicates removed; full text, peer reviewed, English) than the 2-years since the pandemic (2020 to May 2022) (n=12 after duplicates removed). The year with the highest number of ‘online yoga’ articles was 2021 (n=6) including: a systematic review of online yoga delivery in eight studies specific to hatha¹⁹³ yoga (Brosnan et al., 2021); and an Australian study of online versus in-person yoga during the pandemic to explore participant preference (Brinsley et al., 2021). Though Brosnan et al.’s (2021) review was small-scale (n=8) and class delivery was inconsistent across studies, their overall impression was that online yoga was a feasible, and low-cost, option for clinical populations. The proliferation of online movement class options since the pandemic

¹⁹² Adult participants were recruited from a “faith-based organization”, with the intervention advertised as an “emotional wellness” program (Przybylko et al., 2021, p. 3). For inclusion, participants had to be able to partake in moderate-intensity physical activity, but given participants self-selected it seems unlikely that any additional checks were made regarding adequate fitness.

¹⁹³ The authors reviewed studies specific to hatha yoga, citing the National Centre for Complementary and Integrative Health (USA) in reference to hatha yoga being the most common style practiced in the West. On accessing the citation to explore further regarding yoga styles, there was no specific mention of hatha, suggestive of an update in the interim (National Center for Complementary and Integrative Health, 2021).

does provide an opportunity for researchers, and health/exercise providers to offer online movement to a wider population. Data on the number of downloads of yoga and meditation/mindfulness apps globally provides direct evidence of their popularity. For example, in the first half of 2021 (up to 21 June) three of the four most popular apps were meditation platforms, equating to 19.4 million downloads versus 5.2 million for the most popular yoga app (Buchholz, 2021). It is likely that the increased popularity of meditation is due to it being accessible regardless of movement limitations, both with respect to appealing to a larger section of the population, and ease of use, i.e. less need for space and equipment.

Given that community featured both in the literature and within this study's themes, access to a supportive online community has the potential to improve any gains from the practice itself. The Australian study (noted above) surveyed yoga practitioners at two time points during the pandemic (August 2020 and April 2021) to compare in-person and online yoga classes in order to gauge preferences and benefits (Brinsley et al., 2021). Almost two thirds (63%) of the initial survey participants (n=156, 92% female; 77.6% aged 25 to 54-years) had a yoga practice of at least five years, with 78% primarily practicing in a studio setting. Whilst online yoga rated more highly for accessibility (both convenience and affordability), in-person classes offered social connection and contributed to participants' social lives (Brinsley et al., 2021). The follow-up survey, albeit a smaller sample (n=55), showed the impact of COVID-19 social restrictions on the uptake of online yoga, with a shift from 82% attending in-person classes to 73% accessing yoga online (Brinsley et al., 2021). Not unsurprising, given the lack of availability of in-person classes during pandemic lockdowns, yet overall participants still preferred studio classes for the group experience (Brinsley et al., 2021). Despite the lack of community online, the authors noted that positive mental health benefits were still experienced. Predictions suggest that a hybrid exercise model may be the new normal, i.e. combining online with in-person movement (Rothwell, 2022).

Research exploring the health benefits of online delivery is sure to expand, but the increased accessibility and affordability is already evident. As Brinsley et al. (2021), whilst the in-person yoga class environment provided connection, energy, and access to individual attention; online yoga was cost-effective, convenient in the context of practitioners' work/life commitments, and offered both privacy and autonomy, with the added advantage of facilitating a home practice. It will be interesting to note whether online movement practices retain practitioners or whether the popularity of in-person

classes does not return to pre-pandemic levels. One factor that may positively impact movement adherence is the nudge towards prioritising health that Singh et al. (2022) call the 'silver lining' of the pandemic. In their small-scale (n=30; 50% female; mean age 34.4-years) tele-interview study exploring coping strategies and adaptations of lockdowns within an Indian population, one of the positive behavioural impacts was an increased health autonomy or 'health consciousness' that resulted in pro-health practices including yoga, meditation, physical activity, and engaging in cooking and eating healthier.

The social constructs within which the practice is experienced cannot be ignored. For example, the Western interpretation of the historical yoga philosophy, and the 'norms' (or the dominant narrative) regarding who represents a yoga practitioner or teacher according to culture, accessibility (equality of opportunity), and the yoga studio business model¹⁹⁴. Of course, as noted above, the virtual proliferation of yoga increased accessibility, and thereby social representations will shift as the practice reaches different populations. The social constructs add an additional layer to the subjective motivations of individuals who choose to try yoga, i.e. the interplay of the macro environment and micro actions. The development of the Western posture-focused practice could equally be seen as the micro creating a macro 'transformation' (Hedstrom & Swedberg, 1998). A prime example of the social narrative can be seen with 'balance', which emerged across the findings with descriptions in the context of the body and in emotions or mood. Yet, the fact that balance was a theme may in part result from the specific yoga context, with the language of balance commonly referred to in Western classes (Brown, 2022). For example, experiences of balancing a busy lifestyle with a yoga practice, or balancing the body and mind through yoga¹⁹⁵. The narratives around life stressors may equally have impacted the style of yoga favoured, with yin yoga (a relaxing style) being the most popular.

In reviewing the most recent literature prior to submission, a large scale (n=8,946) systematic review and synthesis¹⁹⁶ of the evidence from published literature (January 2000 to April 2022) that studied spirituality in the context of health outcomes found that

¹⁹⁴ The so-called "yoga industrial complex" (Brown, 2018) is a colloquial term for the corporatisation of the practice; a topic outside the thesis scope. Though the recent pandemic has democratised yoga by moving the practice onto virtual (cheaper and more accessible) platforms, versus brick and mortar studios.

¹⁹⁵ A simple web search for 'yoga classes for a balanced life' instantly resulted in online content (Glo Incorporated, 2017). As did a search for 'yoga to balance the mind and body' (Chopra, 2012).

¹⁹⁶ The review identified 371 eligible papers that studied serious illness in participant samples of ≥100, with multidisciplinary panels qualitatively synthesising the evidence to identify the strongest evidence base on which to base recommendations for health practice and research (Balboni et al., 2022).

the frequency of a spiritual practice was the predominant factor in reducing all-cause mortality risk (by 27%) and the incidence of depression (by 33%) (Balboni et al., 2022). The authors noted that in the majority of studies, the spiritual practice frequency was denoted as attendance at a spiritual (including religious) service, and affirmed that ‘nontraditional forms of spiritual community’ warranted study. Of particular relevance to this doctoral study, was the recommendation to include spirituality as a social mediator of health (Balboni et al., 2022). In addition, the author’s reference a definition of spirituality put forward by Puchalski et al. (2014) — a definition gained through international consensus within the context of spirituality and compassion in health and palliative care — that offers a paradigm within which holistic movement and contemplative practices can sit:

Spirituality is a dynamic and intrinsic aspect of humanity through which persons seek ultimate meaning, purpose, and transcendence and experience relationship to self, family, others, community, society, nature, and the significant or sacred. Spirituality is expressed through beliefs, values, traditions, and practices. (p. 646)

From the concepts discussed in this chapter, those that sit closest to this definition are: a relationship to self, others, and community; transcending through self-awareness; and accessing spirituality through the practice of yoga. A meditation or other holistic movement practice can offer the same connection to spirituality, with the practice as subjective as the individual experience of the spiritual.

5.5 Final reflections

As noted in the Methods chapter, the transparency of the researcher stance is an integral part of Heideggerian hermeneutic phenomenology, as denoted by the ‘hermeneutic circle’. In addition, Dibley et al. (2020) assert that in order to retain the integrity of the narrative, i.e. to ensure the interpretation remains true to the participants, a researcher needs to be fully aware of their own footprint. Thus the ‘experiential grounding’ from which the researcher has interpreted the data, while referenced at specific points in the thesis where relevant, requires an explicit statement (Rosenblatt & Wieling, 2019).

5.5.1 Researcher Reflexivity

The researcher has practiced yoga consistently since 2007, and has been a teacher of both movement and meditation-focused practices. As a practitioner, the teacher trainings offered an in-depth retreat into the practice, away from life's commitments, and provided both negative (needing time away from practice after teaching) and positive influences on the practice. On the negative side, teaching was at times prioritised over the personal practice; whilst conversely, meditation training provided a deeper connection to the practice, from both an embodied internal perspective, and from a desire to share the experience of, and teach from, an enlivened sense of presence. The practice is, most weeks, a daily occurrence, and has been throughout the doctoral journey; offering a place to ground, particularly to drop out of the mind and feel into the body and the environment. Yoga has often provided the space to consider participant themes from an experiential (practice) perspective by stepping on the mat with a specific question or thought in mind.

Creating space away from the thesis — by stepping on the mat — also featured within the study design, in order to insert a clear boundary between the data collation and data analysis phases. The constant challenge of interpreting a context that the researcher has a familiarity with requires a dual presence, both being a part of — or an agent within — the yoga world, and reflecting back on and questioning it. As Hernes (1998) wrote almost 25-years ago: “Social scientists are commuters between two worlds: the world they make and the world they mirror.” (p. 100)

Rapport with interviewees was facilitated by a shared interest, with a definite resonance felt between the researcher and the majority of interviewees. However, this ability to resonate can be both positive and negative. On the positive side, facilitating an environment within which participants feel safe to share in-depth accounts; while potentially “intruding upon the data” (Rodham et al., 2015, p. 64) with the researcher's own experience. Having a comparator group, such as the gym practitioners in the original research protocol, would have enabled a direct comparison of the yoga versus gym interviews, in effect providing an additional bias check with the researcher being less connected to the gym environment in recent years.

The inclusion of space between interviews and analysis provided a barrier of time between connecting with interviewees as a researcher-practitioner and consideration of the transcripts from a wider phenomenological (versus yoga) stance. In addition, the use of audio recordings to provide access to both the non-verbal conversational cues, and the

participants' tonal reflections and emphasis, strengthened the validity of the interpretation (Rodham et al., 2015). The audio recordings created a sense of re-engaging with the interviews, not just from a retrospective perspective, but from a different angle removed from the visual and present moment experience of engaging face-to-face. This reflexive vigilance is intended to uncover researcher bias and avoid contamination of the participant narrative, with the added safeguard of peer-review of the initial coding schema (by the primary supervisor). An additional measure to capture the participant experience, was to code from a full sentence or group of sentences (see Appendices D and E for examples of coded segments) in order to capture the contextual meaning of an experience. Thus, rather than focusing on specific words that might resonate with the researcher or point towards a possible theme, the interpretation was informed by the lived context. Bearing in mind, that the researcher's subjective footprint (including unconscious bias) is ever present. Limiting this footprint is possible; removing it entirely is not. Nor is it a requirement of the chosen methodology.

A reflexive approach to the findings considers the participant narrative from the researcher's own experience of yoga. Focusing on the key concepts discussed in Section 5.3.3, three (of the five) stand out as experiential concepts relevant to the researcher's practice and application of yoga 'off the mat'. As noted prior, the explicit use of grounding, particularly in the context of connecting to the natural environment is a daily resource for the researcher; one that can be both settling and energising. The use of breathing techniques is a 'work in progress', a term used by Campeau-Bouthillier (2021), as even after many years of yoga practice the researcher can notice herself breath-holding, alongside the resultant tension. Though the practice is, above all else, a practice of noticing. The third concept of the pause, both on the mat (experienced as a welcome pause from everything else but yoga) and on the cushion (particularly relishing the extended pause after the exhale), is an experience that readily translates 'off the mat' as a pause before responding; thus similar to the shared examples of the study's participants.

The use of a mixed-methodological approach does provide both rewards and challenges. On the positive side: being able to access practice component data (and teacher status) provided a complementary framework, or entry point, through which to engage with the participant experiential narrative. Whilst the triangulation of data sources, e.g. comparing survey and interview responses to the same question, was a reliability check and thus a safeguard against the presence of the researcher's influence on interviewees. Yet conversely: the researcher experienced tension with a mixed approach,

particularly within the confines of a semi-structured interview design. Guiding participants towards the topic under study, whilst not directing or constraining the conversation, is a balancing act. On reflection, the addition of two or three open interview questions that were less confined to the research questions, but expanded the conversation towards the wider research discourse, e.g. mindfulness or spirituality, may have proved more fruitful than simply asking participants if they had anything further to add. This expansion may have offered further insight into the context of yoga (and related concepts) within participant's lives, though could also have veered beyond scope.

Finally, the shifts in the project over time, both prior to and after data collation (as discussed in the Methods chapter), required a keen intent during the final write up phase to best encapsulate the aims and objectives whilst leaving aside the residue of variables no longer included in the final thesis. For example, not including the objective HRV data shifted the findings further towards the subjective influence of the practice, as experienced by the participants. Thus, any 'effects' noted in the participant narrative, have been clarified as 'experienced effects' to delineate the qualitative findings accurately.

5.5.2 *Limitations of study*

The limitations of measures that use numerical ratings do dictate caution when generalising, in addition to the sample size ($n=38$) which is limited for definitive inferences based on statistics. The nutrition and exercise self-efficacy scores were consistently reported as positive, which could in part be a consequence of repetition (as noted in the Findings chapter). Whilst measures can be a quick tool to capture an overall trend, the ease of selecting a number does require caution even with large sample sizes. For example, the nutrition SES included a question on self-efficacy regarding a situation where one might 'have to rethink [an] entire way of nutrition'. This is undoubtedly a complex issue potentially not well matched to the swift response likely when selecting a numerical rating. In addition, some of the open-ended survey responses were simple and to-the-point, which may be indicative of the potential for limited reflection when completing an online survey. However, whilst a response such as a yoga practice is "Yoga that I do regularly" may equate to a lack of engagement with the platform, this succinct response may reflect the simplicity of an habitual practice. In other words, the regularity of the practice is what defined the practice for the participant, and given the relevance of consistency to adherence, it is a key element of being a yoga adherent.

Response bias is a common limitation of surveys. In addition to participant (or voluntary response) bias, i.e. participants who volunteer for a study are a subset of the wider population with a specific interest in the research topic, the following biases may be present: social desirability bias, whereby participants seek to adhere to the cultural norm of how a 'yoga practitioner in NZ' may respond; acquiescence bias, where participants have a tendency to agree with the question being asked; and demand bias, where the research topic and the communication provided (e.g. information sheet) can nudge participants towards responding in a way that would support the research aims (Qualtrics, 2022). In addition responses may be influenced by lack of engagement, which could be an explanation for the similar IPAQ-SF results across participants, given this was the last set of questions in the online survey and response fatigue could have set in. The only identifying feature of the IPAQ-SF results arose from the high tenure interviewees (who recorded more vigorous exercise). Perhaps they were a more engaged subset, or the results were indeed indicative of greater stamina in a population with a movement practice of more than 10-years.

A further limitation is the lack of diversity of participants, though the baseline characteristics do match the current norm for published yoga studies. Efforts are being made to increase the diversity of research participants — amidst wider global equality activism — which will increase the relevance and reach of research, and hopefully further promote the practice of yoga to a wider demographic. The findings were primarily based on the experience of females (85% of participants) which may have imparted a specific interoceptive bias, given the influence of gender on interoception, though this will be comparative to the published (female dominant) studies and may in part explain why yoga appeals to the feminine side of the gender spectrum. A 2017 paper (n=376; 51% male; aged 17 to 30-years; primarily University students) found that females scored significantly higher than their male counterparts in the MAIA body listening and emotional awareness scales (Grabauskaitė et al., 2017). As such, the authors recommended accounting for the effect of gender when studying interoception. A recommendation supported by Longarzo et al.'s (2021) study that showed the brain structures relevant to interoception¹⁹⁷ differed according to gender in a healthy sample of 73 adults (female to male ratio 37:36; mean age 43.5-years for females; mean age 37.4-years for males), with a wider spread of

¹⁹⁷ The authors found that females had a stronger correlation than males between the area of the brain related to interoception (the insula) and interoceptive sensitivity (assessed via self-report) (Longarzo et al., 2021).

interoceptive capability across brain regions in females. The social influence on a 'feeling' sense, which is more of a feminine construct, is potentially a factor at play in a gendered neural experience of interoception. A more integrated neural process in females may be a development that has preferentially evolved according to gendered roles. This differential neural structure could, in turn, provide one explanation of yoga being predominantly a feminine pursuit, given the practice's internal focus. A further element to account for, which was not considered in this study's design, is the measurement of participants' current psycho-physiological state which can mediate interoception (Ewing et al., 2017; Garfinkel & Critchley, 2013; Terasawa et al., 2013).

The analysis prompted reflection on areas that warranted further detail or were omitted; a limitation that will also be discussed in the context of recommendations for future research (section 5.6). Within the findings, participants referenced the use of tools or coping strategies learned from yoga without detailing the actual tools used, aside from the breath. It would have been valuable to have sought clarification, e.g. by adding a further data-gathering stage to the research design whereby consent was sought to ask specific questions of participants where their responses would have benefitted from more explanation. An additional example where clarification would have been useful was related to the teacher sub-group and their experience of negative impacts on their practice, particularly with respect to a decrease in exercise self-efficacy.

A decision was made to not include member checking within the study design, i.e. to check whether the researcher's interpretation of a participant's account was consistent with their experience. The decision to not seek retrospective participant reflections was based on the fact that this process can add a further layer of complexity, e.g. a participant may have altered their practice and/or had additional experiences of practice, or a change in life circumstances, that could shift their own interpretation from its original intent. Further, the selection of retrospective questions risks contamination by the researcher in terms of magnifying specific aspects of the narrative.

Probably the most obvious limitation is that of self-selection, which can positively bias the study findings. The participant pool are likely to be more open to discussion of the subtle outcomes of practice (such as spirituality) simply because: (i) they were interested enough in the topic to partake in the research, and/or (ii) they feel that their practice has influenced their lives. Not forgetting that the research questions themselves frame the discussion towards the impacts of a yoga practice 'off the mat'; in turn influencing the

overall context within which themes emerge. In hindsight it would have been valuable to gather experiential data from those participants who felt yoga was not a supportive framework for diet and other exercise. And, as noted earlier, from the two participants who chose not to practice when they did not feel like it. This expansion of the framework within which data was gathered would have widened the conversation, yet would have still been limited by the self-selection bias. The study design would have benefitted from seeking out a second participant pool, such as practitioners of a different, ideally ‘non-holistic’ movement practice, such as running or swimming, and capturing their experiences in comparison to yoga practitioners. Alternatively, seeking out participants who had tried yoga but not found any benefits ‘off the mat’ would have offered a contrasting paradigm, though likely would prove challenging to recruit.

Finally, this study is not able to account for all mediators of behaviour, such as social environment, though these were occasionally mentioned in participant narratives, e.g. taking time out from family to practice. As Lakoff and Johnson (1980) state, our experiences “are products of our interactions with [the practice] in our environment” or so-called “*interactional*”¹⁹⁸ properties” (p. 177). The subjectivity of the experiential narrative, and the “physical and cultural environment imposes a structure on our experience” (Lakoff & Johnson, 1980, p. 230). As such, generalisability of findings is not possible. Yet, the container of a yoga practice is transferrable to other yoga populations, and even to other embodied movement practices, though the further the journey from the mat, the more limited the extent of transferability. Of course, whilst experiential data offers depth, it is limited to the responses shared. Thus, it is not possible to differentiate whether the ‘off the mat’ effects experienced (that participants assigned to their practice) are the result of other physical activity (aside from, or in combination with, yoga) and their dietary choices. The possibility that yoga is *not* a contributing factor to participants’ additional pro-health behaviours — given that yoga itself is a health behaviour — is an alternative conclusion that cannot be excluded, i.e. though participants felt experience is that yoga has had a positive influence ‘off the mat’, these experiential findings are indicative of yoga’s impact, rather than evidence of an effect.

¹⁹⁸ Emphasis (italics) as per the quote.

5.5.3 *Unique approach*

Rather than defining a yoga practice — or yoga prescription — this study explored an ‘embodied interpretation’ of a yoga practice (O’Brien-Kop & Newcombe, 2021); a practice experienced by participants situated within a modern day NZ context. Consequently, this doctoral study was focused on the lived experience of a yoga practice ‘off the mat’, with a design that accommodated participants’ practice preferences, capturing experiential data that explored the influence of yoga in participants’ lives. The point of difference, evident in the findings, is that the practice itself was the central factor in yoga adherence. The self-regulation resulting from practice in turn facilitated an ongoing practice. In essence, a self-sustaining loop that integrated the mind and body in the direction of pro-health habits, with yoga being just one of those habits. Whilst there is a prominent discourse seeking to understand the factors at play within the practice, this study’s findings illuminated how integrated the practice is, both in terms of integration within participants’ lives, and with respect to the mind-body (or systemic) effects that do suggest a parasympathetic, and thus self-regulatory, shift as a result of practicing yoga.

The value of these findings, and this study’s contribution to the wide-ranging fields of research within which yoga may sit, is that a yoga practice, and likely any holistic movement practice that integrates the mind and body, may be experienced as a self-regulatory tool to support a shift towards pro-health behaviours. Indeed, finding a movement modality that resonates with an individual, especially one that is enjoyable, can promote adherence. The practice of being embodied, including noticing or feeling into the physical and mental experience, both during and after movement, has the potential to further enhance a shift towards self-regulated lifestyle choices. More specifically, this study adds to the current discourse within the interoception/embodiment research fields by providing an experiential lens that focused on the value of the *experience* of interoception, or being embodied, for pro-health behaviour. The participants provided lived examples of acting with awareness (Sala et al., 2020), and self-regulating from an embodied mind (Roche, 2018), thus adding a subjective richness to these concepts.

Given that one of the experiential concepts was the embodiment of breath, including the application of breath practices ‘off the mat’, yoga may offer an enhanced access to embodiment through the breath and, more specifically, by linking (or anchoring) breath to movement. As an aside, an alternate explanation for pro-health decisions in movement practitioners was posited in a new paper (based on five separate studies) by Zimmermann

and Chakravarti (2022), whereby individuals who were regularly active had an improved tendency to make decisions focused on 'goal-relevant' (rather than distracting) factors, with the suggestion that 'embodied cognition' learned through movement (both in the planning and execution of an activity) can be applied 'off the mat'. Suffice to say that the authors conducted studies in different populations and environments, including gym attendees and runners, and offer an interesting idea adjacent to the self-regulation research.

This simple (and potentially easily applicable) approach to movement, i.e. to connect with the experience of movement and the effects of movement, offers a different paradigm to promote pro-health lifestyles; one that seeks to connect the individual with their own flavour of movement. This connection offers a three-fold adherence model: connecting to a practice of one's choosing; connecting to the mind-body sensations; and potentially, connecting to a social community who resonate with the same movement practice. More research designed to learn from the positive experiences of movement practice adherents, particularly exploring the transition to a committed practice, would further inform health promotion strategies by providing experiential data on health behaviours shifting to habits.

5.6 Implications and recommendations

Whilst the thesis was focused on how a yoga practice may support additional exercise in practitioners (as part of a wide-ranging healthy lifestyle), emergent yoga research within the field of sport performance is exploring the potential of mindfulness and increased interoception among the athletic population, no doubt buoyed by the global trend for mindfulness and yoga. The evidence to date tends to be limited to small scale pilot interventions, but athletes subjectively report cognitive and performance benefits, so this is a subset worthy of exploration to gauge statistical significance (Briegel-Jones et al., 2013). The media may have a positive impact on research funding as stories of sports teams adding yoga to their training regimens are published (Dutton, 2019). Furthermore, adoption of yoga by male-dominated sports may reduce the perceived barriers to men (McIver et al., 2022).

Within the interoception/embodiment research field, studies that engender a heightened sense of awareness, i.e. include guidance on embodiment techniques, would

add to the literature on holistic movement practices. Furthermore, to consider physical activity beyond the holistic paradigm, it would be interesting to allow participants to practice a movement modality of their own choosing, yet with education on interoceptive awareness, in order to study the effect of holistic and ‘non-holistic’ movement practices prior to, and after, embodiment has been incorporated. Non-holistic being a questionable term, given that all movement results in systemic outcomes, even at a purely physiological level (versus experiential). One caveat worth noting is that embodiment can result in negative outcomes, such as self-consciousness, in specific sub-populations. For example, females uncomfortable with their body shape (Paulson & Greenleaf, 2022). Research that explores the influence of embodied signals on brain function, including how context may moderate that influence to support ‘embodied cognition’, is a rich area of study. The potential of holistic movement practices — that tend to emphasise an internal, or felt, experience of movement — to offer a supportive framework for embodied cognition is a worthwhile topic to study.

Possibilities for future research include, but are not limited to, the use of specific interoceptive guidance to influence behaviour change; the use of a fixed (internal or external) gaze; and promoting the social identity association with a movement practice. As noted, using interoception to tune into specific areas of the body and/or mind, may positively influence desired pro-health behaviours. The example used earlier was attuning to gut sensation to guide dietary choices, but other examples could be focusing on a sensation of lightness in the physical body and imagery of effortless movement to promote activity ‘off the mat’; or to practice at different times of the day to ascertain the optimal time to move according to how the body feels during and after a yoga session. Following the lead from Balçetis et al. (2020), using either an internal or external gaze during practice, alongside an assessment of perceived effort post-practice, could explore adherence according to focus. Given that a one-pointed gaze (or *dhāranā*) is the sixth limb of yoga, this avenue of research may offer additional insight relevant to the contemplative aspects of practice. While the influence on movement practice adherence related to a social identity, social belonging, or social cohesion — as noted by Cheshire et al. (2022) — is an area of health promotion that has an unlikely ally as a result of the isolation experienced during the COVID-19 pandemic.

As noted prior, reflections post-analysis highlighted specific aspects of the study design that could be improved to provide more in-depth data. For example, clarification on participants’ home practice, particularly with respect to whether it was self-guided or

whether they accessed a live or recorded class, may have provided insight regarding self-efficacy and/or motivation, and whether access to a virtual community played a part. The researcher has been surprised by the experience of a live-streamed online class versus partaking in the identical class recording. An element of being on a mat, moving through the same sequence in the present moment, regardless of time zones, offers an unexpected sense of connection to both the teacher and the unseen participants, and speaks to the potential for online engagement with untapped populations. The online movement industry looks likely to endure 'post-pandemic', so research into methods of delivery that best promote social connection is warranted, especially given the potential for improved adherence with community, combined with an increase in accessibility.

5.7 In Conclusion

The overarching aim of this study was to explore whether adherence to a yoga (movement) practice was experienced as a downstream positive self-regulatory influence on health behaviour, within a small NZ population of self-identified yoga practitioners who shared their lived experience of the practice 'off the mat'. Overall, the findings draw attention to the potential of embodied movement practices to facilitate pro-health behaviour and habits, in the context of diet and physical activity. The majority of participants felt that their yoga practice facilitated pro-health habits; a self-regulatory benefit that may be indicative of parasympathetic influence. The practice provided additional benefits, including, but not limited to: stress management; connection to community, the breath, and to the 'self'; and as a lens or filter through which to engage with life.

This study adds support to recommendations in the literature regarding the potential of yoga as a behaviour change intervention. The underlying process at play remains unclear. Perhaps yoga may optimise self-regulation by facilitating a degree of effortlessness, akin to the 'effortless willpower' coined by Quirin et al. (2021). Maybe the practice replenishes energy resources, inspires motivation, and/or facilitates the neural capacity to self-regulate, thereby reducing 'self-control fatigue' (Forestier et al., 2022). Another explanation may be that the act of creating a pro-health behaviour (yoga)

optimises one's efficiency and endurance to adopt others, in effect a form of 'willpower training' (Audiffren et al., 2022). However, what is clear from this study's findings, is that the practice itself acted as a self-regulator, both for ongoing adherence to the practice and, for some (but not all) practitioners, providing a framework from which to make pro-health choices, in the context of diet or other movement 'off the mat'. Practitioners wanted to support the discipline of practice in their food choices, i.e. to not negatively impact their yoga, and their attunement to embodiment provided internal self-regulation through an awareness of either what the body needed, or how the body felt after eating certain foods. In addition, the movement practice engendered physical activity 'off the mat'. The yoga practice was a self-sustaining positive feedback loop, integrating the body and mind towards pro-health behaviours. The practice itself acted as a pro-health habit and supported pro-health choices. As Roy and Charlton (2019) propose, yoking to the practice, i.e. being in relationship to the yoga, enables the 'off the mat' effects. This relationship to the practice was experienced as a self-regulation guided by an embodied awareness.

Yet, the practice does not have to be yoga. The key is finding a practice that one can build a committed relationship to, which is more likely if the movement is enjoyable. Any holistic movement practice has the potential to engender pro-health outcomes, and any movement can be holistic if it incorporates an internal and/or embodied focus, such that it provides an experience of being 'meditation in movement'. As Szabolcs et al. (2021) noted, the more male-dominated martial arts can be mindful and embodied practices. From a personal perspective, swimming provides an enhanced sense of embodiment to the researcher, beyond that experienced with yoga, via the additional sensory stimulation of the water and the feeling of a body not entirely subject to gravity. Running can equally be an embodied and meditative experience, with the potential for a rhythmic relationship between the feet and the ground. In fact, one running text encountered as the thesis was in the final revision stage emphasised how translatable these findings are. The text, infused with Buddhist philosophy, is about running being an 'art of meditation in motion' (Goddard, 2020). One chapter, focused on commitment, offers readers the chance to put their running into practice, by committing 'to a consistent running practice for a minimum of a month', with the author asserting that: "Commitment, like practice, requires clarity, concentration, [and] consistency ..." (Goddard, 2020, p. 20). This statement resonates, not only with respect to practice and commitment being intertwined, but in regard to the focus or concentration necessary for an embodied awareness, which in turn provides a

clarity or attunement of interoception that can guide ‘off the mat’ decisions. Embodied movement is the key, as noted by Lucas et al. (2018) who highlighted the importance of developing an intrinsic sense of being in the movement, irrespective of the practice or modality.

Given the extent of sedentariness globally — compounded by government lockdowns during the pandemic— and the projected health costs (not just to individual lives, but to countries), finding simple and applicable strategies that can increase the adoption of, and (crucially) adherence to, movement practices that resonate with individual preferences are a priority. A 2022 Australian study based on a sedentary behaviour model¹⁹⁹ suggested that reducing sitting time by just 36-minutes (in adults who sit for at least four hours a day) could result in an annual saving of A\$39million in health care costs; an incredible calculation that offers a powerful metaphor for the negative impact of prolonged sitting (Nguyen et al., 2022). Though the authors do acknowledge the lack of consensus regarding the number of daily hours of sedentary behaviour that increases health risk; one would expect health care costs to reduce as movement levels increase. The global health promotion agenda needs populations to move. The WHO set out a global plan (for member states) to reduce physical inactivity (in adults and adolescents) by 15% from a 2016 baseline to 2030, i.e. by approximately 1% per annum; a goal that requires a policy-wide approach including addressing shortfalls in infrastructure and socioeconomic inequalities that create upstream barriers for access to exercise (World Health Organization, 2018). Improving access to safe spaces in which to move is a societal health and equity issue.

By fostering embodiment, movement can potentially elicit self-regulatory pathways that engender health, whilst providing a more ‘holistic’ experience for practitioners. Rather than a specific ‘yogic perception’, the possibility to create a ‘movement perception’, i.e. perception informed by movement, is a concept worthy of further research. Adherence not only fosters ongoing pro-health change, but increases the opportunity to connect with a social community who have chosen the same movement modality. Perhaps, rather than ‘practice makes perfect’, the slogan could be: practice makes better (health choices). Returning full circle to the title of this thesis, being ‘embodied in life’ is a reminder of the possibility of a movement practice to enliven the practitioner by connecting them to their

¹⁹⁹ The model considered the difference in so-called sedentary behaviour-related diseases (or obesity-related diseases, such as cancer, heart disease, and stroke) according to sitting time (Nguyen et al., 2022).

inner state of being, both body and mind. Moving through life from this connection creates the space for self-regulatory choices to be informed by an embodied awareness. The simple message, to attune to embodiment through movement, is the key narrative to emerge from this study.

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Glossary

This glossary is not comprehensive and is listed in alphabetical order. The aim being to collate terms that have multiple definitions (and thus provide the definition that informed the thesis), or to list terms that may be novel to the reader.

Habit is an automatic response within a specific context, such that when encountering that context the “learned context-response association” (Gardner & Lally, 2022, p. 2) results in the habitual response. For relevant context, a health behaviour is an habitual behaviour once the act of behaving, e.g. practicing yoga at the start of each day, has become habitual.

Interoceptive awareness is an individual's own awareness and/or perception of their internal landscape, including sensation and position in space (proprioception). Sensation can be limited to just one specific muscle, or to a limb, or can encompass a global or whole body awareness.

‘Off the mat’ simply denotes the impact of yoga external to the practice itself. The impact(s) being subjective to the individual practitioner.

Self-efficacy is a long-held concept introduced by Albert Bandura in the 1970's (Bandura, 1977). It can be defined as an individual's belief in their own capability (or skill set) to undertake a task effectively, and is positively linked to adherence (Buchmann, 1997). This makes sense, as one is more likely to sustain effort in the face of obstacles, e.g. finding time within a busy schedule to exercise, when one has a strong conviction to succeed (Bandura, 1977).

Self-regulation is defined by Baumeister and Vohs as “processes by which the self intentionally alters its own responses, including thoughts, emotions, impulses, performance, and behavio[u]r” (p. 79); and more specifically this self-regulation requires effort in order to create change (Baumeister & Vohs, 2018). Self-regulation can be delineated into self-relaxation and self-motivation (Kuhl & Fuhrmann, 1998); loosely aligned to the parasympathetic and sympathetic states respectively.

Appendices

Appendix A: Ethics Approval AUTECH 16/307

- i. Initial approval November 2016
- ii. Amended approval May 2018: Change of primary supervisor and approval to obtain participant consent via email

Appendix B: Participant Forms

- i. Information Sheet
- ii. Consent Form

Appendix C: Recruitment Postcard

Appendix D: Exemplars of Coding Process

- i. Record of stages of coding (interview data)
- ii. Excel coding of survey responses (survey cohort)
- iii. Table of codes versus interview questions

Appendix E: Exemplar Table of Theme Fit to Data

Appendix A: Ethics Approval AUTC 16/307

- i. Initial Approval
- ii. Amended Approval

AUTEC Secretariat
Auckland University of Technology

15 November 2016

Aaron Jarden

Faculty of Health and Environmental Sciences

Dear Aaron

Re Ethics Application: **16/307 Yoga as a self-management tool: The flow-on effect of Yoga to physical health, psychological wellbeing, and positive health behaviours**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 14 November 2019.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 14 November 2019;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 14 November 2019 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.

All the very best with your research,



Kate O'Connor
Executive Secretary
Auckland University of Technology Ethics Committee

AUTEC Secretariat

Auckland University of Technology

1 May 2018

Elizabeth du Preez
Faculty of Health and Environmental Sciences

Dear Elizabeth

Re: Ethics Application:

16/307 Yoga as a self-management tool: The flow-on effect of Yoga to physical health, psychological wellbeing, and positive health behaviours

Thank you for your request for approval of amendments to your ethics application. The amendment to allow consent to be obtained by email is approved. The change of supervisor is also noted. I remind you of the Standard Conditions of Approval.

1. A progress report is due annually on the anniversary of the approval date, using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>.
2. A final report is due at the expiration of the approval period, or, upon completion of project, using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>.
3. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form: <http://www.aut.ac.nz/researchethics>.
4. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.

Please quote the application number and title on all future correspondence related to this project.

AUTEC grants ethical approval only. If you require management approval for access for your research from another institution or organisation then you are responsible for obtaining it. If the research is undertaken outside New Zealand, you need to meet all locality legal and ethical obligations and requirements.

For any enquiries please contact ethics@aut.ac.nz

Yours sincerely,



Kate O'Connor
Executive Manager
Auckland University of Technology Ethics Committee

Appendix B: Participant Forms

- iii. Information Sheet
- iv. Consent Form

Researcher and primary supervisor contact details removed.

Participant Information Sheet: Yoga Tenure

A study of yoga students with a practice of at least six months at yoga studios within New Zealand.

Date Information Sheet Produced:

1st May 2018

Project Title

Yoga as a self-management tool: A study of the flow-on effect of yoga and/or a movement practice to pro-health habits.

An Invitation

Dear Yoga Student

My name is Wendy Reynolds, and I am a yoga teacher, acupuncturist and doctoral student. I would like to offer you the opportunity to participate in a research study which will contribute towards a PhD. As a yoga student I would like to explore how the experience of yoga may have impacted your life.

I would just like to assure you that it is your choice to participate or not, and there is no obligation to take part in this study.

What is the purpose of this research?

Findings in relation to long-term adherence to yoga may be of use to the health and fitness industry to support clients to adhere to regular physical activity. Yoga is low-impact, accessible, and offers wide-ranging positive effects, particularly with respect to reducing the stress response (Kiecolt-Glaser et al., 2011; Payne & Crane-godreau, 2015; Rocha et al., 2012). This research aims to position yoga not just as a treatment option for stress, anxiety and depression, but as a low-cost preventative tool (Caplan, Portillo, & Seely, 2013; Rocha et al., 2012). Yoga could be promoted as a useful weapon against obesity via its positive impact on stress reduction (Ross & Thomas, 2010; Brunner, Chandola, & Marmot, 2007). Evidence-based tools to assist people towards the uptake and adherence of positive health behaviours have the potential to redress the balance towards a healthier NZ population.

How was I identified and why am I being invited to participate in this research?

You have been recruited after expressing your interest in this research advertised at participating yoga studio venues. You have shown an interest in participating in this research via your response to advertisements placed at participating yoga studios and/or via studio Facebook pages. To be eligible to participate you must be aged 18-65 years, with a committed yoga practice of a minimum of 6-months, and with access to a smartphone. In addition, you must consider your yoga practice to be your primary mode of physical activity.

How do I agree to participate in this research?

If you feel that participating in this study is of interest, please feel free to just email to say you would like to participate and I can forward you the research protocol and consent form. If you have any questions I can answer these via email, or via phone or video.

Please be assured that your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You may withdraw from the study at any time. For example, if we arrange to meet to discuss the research protocol, you may choose to withdraw once I have clarified exactly what the study entails.

If you do choose to withdraw from the study once data has been collected, you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

As a participant in this study you will be sent a link to complete an online survey (approximately 15-30 minutes), including a few questions about your practice and lifestyle. The questions are a mixture of drop down, multiple choice, or space for you to write a few sentences in your own words.

You will be asked to measure your heart rate variability or HRV (the difference in heart rate between inhalation and exhalation) via a downloadable app for 14 consecutive days (HRV is measured first thing in the morning, while seated via your smartphone camera, and takes just a couple of minutes). In return for access to your HRV data, you will be offered a Koha voucher of \$20 to refund you for the app purchase (approximately \$17.50 or USD12.99).

A small random sample will be offered the chance to be interviewed at a convenient time/location to more fully explore how your yoga practice may have impacted your life, but there is no obligation to be interviewed if selected.

What are the discomforts and risks?

No discomforts or risks are anticipated with this research study.

What are the benefits?

Participation will provide you with the opportunity to reflect on the experience of your yoga practice and your lifestyle in general. In addition, the measurement of HRV will enable you to gain an understanding of how often you reside in your parasympathetic or 'rest and digest' nervous system, via a summary of your heart rate variability results. If you are interviewed, you will also receive a summary of interview themes that relate to you.

For myself, the researcher, the chance to explore yoga 'off the mat' will ideally provide a platform from which I may promote yoga within the health system (via my experience as a health practitioner). Thus, whilst personally the research will lead to a PhD, professionally my desire is to use this research for the benefit of the wider community, e.g. by increasing accessibility to subsidised yoga classes and exploring factors that may support exercise adherence.

How will my privacy be protected?

Your data will remain confidential to all except myself via allocation of a number or pseudonym if, for example, any excerpts from interview transcripts are included in the research findings.

What are the costs of participating in this research?

Participation is free, unless you choose not to share your HRV data (thus incurring the cost of the HRV app). There will be a time burden of up to 1-hour for ALL participants (completion of online survey and 14-days of HRV measurement). If you are randomly selected for interview, this may take up to 75mins.

What opportunity do I have to consider this invitation?

You will have 10-days to consider whether or not to participate. Please feel free to email or text any questions that you may have, and I can always call you on request.

Will I receive feedback on the results of this research?

You will receive updates when research findings are published (unless you select to opt out of receiving updates on the consent form).

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Elizabeth du Preez

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTC, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext. 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details: Wendy Reynolds

Project Supervisor Contact Details: Dr Elizabeth du Preez

Approved by the Auckland University of Technology Ethics Committee on *6/12/2016*, AUTC Reference number *16/307*.

Consent Form

Project title: Yoga as a self-management tool: A study of the flow-on effect of a movement practice to pro-health habits.

Project Supervisor: *Dr Elizabeth du Preez*

Researcher: *Wendy Reynolds*

- ☐ I have read and understood the information provided about this research project in the Information Sheet dated 01 May 2018.
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ☐ I understand that if I am selected for interview, notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- ☐ **I give my consent for the researcher to access my online class attendance records at my yoga studio.**
- ☐ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ☐ I understand that the research findings will be used to form part of a PhD qualification, and that findings may be published in both academic and non-academic formats (with all identifying details of participants removed).
- ☐ I agree to take part in this research.
- Yoga Tenure Study** Yoga practitioner ☐

You will automatically receive summaries of the findings and be advised of any publications relating to this research

unless you opt out by selecting the items below: -

- I do not wish to receive a summary of my own findings: ☐
- I do not wish to receive a summary of the complete research findings: ☐
- I do not wish to be informed when any findings are published: ☐

Participant's Signature: **DATE :**

Participant's Name:

Participant's Contact Details :

.....
.....
.....

Researcher Signature:

Approved by the Auckland University of Technology Ethics Committee on 6th December 2016; AUTEK Reference number 16/307.

Appendix C: Recruitment Postcard



The postcard features a photograph of a yoga class on the left side, with several people in a studio setting, their arms raised in a yoga pose. The background is a soft, out-of-focus indoor space.

Yoga PhD Research



AUT
TE WĀNANGA ARONUI
O TĀMAKI MAKĀU RAU

WANTED
**Yoga students with a practice of
at least 6-months**

**Exploring yoga's impact
'off the mat'**

**Pick up an information pack from
reception, or email the researcher:**

[Redacted Phone Number]
Wendy Reynolds

Appendix D: Exemplars of Coding Process

- i. Record of stages of coding (interview data)
- ii. Excel coding of survey responses (survey cohort)
- iii. Table of codes versus interview questions

Record of stages of coding (interview data)

A	C	D	E	F	G	
Step 1: Categorisation - First Round using DATA SOURCE: Transcript		Step 2: Initial Codes	Initial Themes	Step 3: Theme Fit	Step 4: Themes to MAP	
				Transcript + AUDIO	REFINEMENT	
Goal/Intention	that kind of sense ..." "...just doing the practice for the love of it."	practice		SR-habit-practice	SR-habit-practice: narrative around the 'practice' - a love of the practice itself	
Goal/Intention	"...I don't go to each class with the intention of getting something out of it per se or, you know, I don't reflect on problems that I'm really conscious of..." "I'm finding a lot of the time that, that when I'm doing the practice my mind kind of naturally empties which is really useful."					
Goal/Intention	"... when the instructors talk of intention, I generally just throw something really general out there like, you know, just an intention of love really or something like that. But nothing more specific, it normally is just very high level in general for me. "					
Habit Strategies	[Convenience] "It's so easy to get to ... the studio's close ... If I lived, you know, a fair while away, there's always a good excuse not to go along." "I'm pretty sure I wouldn't be going so regularly if it wasn't so I go down to the gym [at lunchtime], which is right next door to my work in town ... and I just roll out my mat ... I'd say about between an hour 15 hour 45. "	access	convenience/loc access			
Habit Strategies	"It would be nice if I had more of a routine but I just have to go with the flow and accept when I can do it, and when I can't. "	access	fit practice into routine convenience	access habit-routine	SR-	
Habit Strategies	"You just got to make it work. You know, if you don't make it work, then that's another excuse why you can't do anything."	acceptance	go with the flow	lens-acceptance		
Habit Strategies	[Now]: "I try to go, when I'm in a good space, two to three times a week. But it's so, so many ebbs and flows for me because my life is ... Like I don't meet many women or men at yoga who have four kids..." "Realistically, I couldn't be here, if I didn't, you know. If I didn't let some things go! (laughs)"	commitment		SR-habit-commitment	<u>ADHERENCE MIND-SET</u>	
Habit Strategies	"I've been doing it four or five times a week, mostly, for the last 13 or 14 months. That's kind of, yeah it's becoming quite embedded in my lifestyle So it's something I'm committed [to].... "	commitment		SR-habit-commitment		committed YET flexible to life's ebbs and flows
Habit Strategies	"It's quite difficult, especially at the moment I have	commitment		SR-habit-commitment	<u>ADHERENCE MIND-SET: practice 'embedded in ... lifestyle'</u>	

Excel coding of survey responses (survey cohort)

Clipboard		Font		Alignment		Number		Styles		Cells		Editing												
Sometimes I don't practice but I know I'll feel better if I do, even if it's not during or directly after my class. I have also roped friends into joining me on my early morning classes to keep up the momentum and as I'm the driver this becomes an o																								
B	R	S	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM		
case#	What is yo	How old ar	What does	How long I	Have you t	Please stat	What moti	How do yo	Overall, w	What kind	Has your y	Do you pra	If you would like to	Where do	Where do	Where do	Where do	Where do	Why are yc	ATTENDANCE	Q104	Q125		
																				DATA				
1	1	Female	26-35	Finding en	18 months	Yes	First traine	Started as	usually cal	I don't get	I used to st	yes definit	Yes	Because I know how	-----	-----	At ONE yo	-----	I currently	I am currently on the earl	6 times a w	75mins		
2	2	Female	56-65	I think of it	4-6 years	No	I did aerob	Relaxed. P	Good flexi	Sometime	I didn't rea	Yes	I pretty much neve	-----	-----	At ONE yo	-----	-----			4 times a w	1 hr		
3	3	Female	46-55	Yoga practi	2-4 years	Yes	I'm going c	My childre	I was amaz	I stopped	I value my	Yes! The m	Yes	I know that yoga is	At home	-----	At ONE yo	-----			3-5/week	4 times a w	60 minut	
4	6	Female	26-35	CONNECTI	12 to 18 m	No		ANXIETY, C	FOCUSED	CENTERED	ABILITY TO	HAVING N	Yes	SOMETIMES I FEEL	-----	-----	At ONE yo	-----			2-5/week	5 times a w	1	
5	7	Female	36-45	Exercise, b	More than	No		Curiosity a	Calm, rela	I would sa	Helps me	I No	Yes	Because I know I'll	-----	-----	At ONE yo	-----				3 times a w	75 mins	
6	8	Female	36-45	Wow - whi	4-6 years	Yes	Currently	Initial intr	AMAZING!	Don't get	All positiv	It is the gi	Yes	Because I generally	At home	-----	-----	At MORE T	-----				5 times a w	60minut
7	9	Female	36-45	My interpr	18 months	No		I started as	At peace. C	My ability	Yoga has h	Absolutely	Yes	Because even if I h	At home	-----	-----	At MORE T	-----				5 times a w	60 minut
8	10	Female	26-35	Yoga practi	6-8 years	No		A friend in	Amazing. I	It has help	It is helpin	I didn't rea	Yes	Sometimes I make	-----	-----	At ONE yo	-----				3 times a w	1 hour	
9	11	Female	56-65	Yoga that	6-8 years	No		Doing mor	Energised, More	mod	Acceptano	Yes - most	Yes	I know I feel better	-----	-----	At ONE yo	-----			1-2/week	Twice a w	90 minut	
10	14	Female	46-55	A yoga pra	2-4 years	No		I had been	How I feel	I am stron	Yoga has ir	Definitely	Yes	Usually because I vi	-----	-----	At ONE yo	-----				4 times a w	1 hour	
11	15	Female	56-65	To me yog	6-8 years	No		I originally	I can feel	As I near	I have quit	I hadn't ex	Yes	If I attend a yoga cl	-----	-----	At MORE T	-----				5 times a w	60 minut	
12	16	Female	18-25	It is time	6-12 month	No		I have alw	In one wor	An increas	I find pract	Not yet, h	Yes	These are the times	At home	-----	At MORE T	-----			3-4/week	Twice a w	45 to 60	
13	17	Female	46-55	My yoga pr	4-6 years	No		The need	Relaxed, r	My breath	I am calm,	It has give	Yes	Because it has beco	-----	-----	At ONE yo	-----				5 times a w	60 or 90	
14	18	Female	46-55	Physical ar	6-8 years	Yes	May 2018	I first start	Content. 2	Greatly im	Tremendo	Physical ar	Yes	Sometimes I don't	-----	-----	-----	-----				3 times a w	1 hour	
15	19	Female	46-55	Mind body	6-8 years	No		Health. Als	Alive, free	strength at	It is the m	It's part of	Yes	Because I know I'll	-----	-----	-----	-----			1-5/week	3 times a w	1.5 hour	
16	20	Female	56-65	Relaxation	More than	No		A desire fo	Relaxed, r	I am more	I am able	I am more	No		-----	-----	-----	-----				4 times a w	-----	
17	21	Female	26-35	Yoga is a m	18 months	No		I went trav	I feel calm	I am stron	I am more	I have mad	Yes	Because I never evi	-----	-----	-----	-----			1/week	4 times a w	60mins	
18	23	Female	46-55	Part of my	More than	Yes	2005	exercise	both calm	That's hard	Not sure th	no	Yes	-----	-----	-----	-----	-----			NO DATA	3 times a w	1 hour	
19	25	Female	56-65	An opportu	More than	No		I had start	Relaxed, r	I It has mai	Last year	I Yes. I start	Yes	Because I know my	-----	-----	-----	-----				Once a w	90 minut	
20	26	Female	46-55	Committing	4-6 years	No		I had frien	Great: I ha	Yoga has t	Again, I thi	Yes, defin	Yes	Because I know I'll	-----	-----	-----	-----				Twice a w	90 mins	
21	27	Female	46-55	A chance to	More than	Yes	2002 (I thi	Stiffness, 2	Calmer, an	I have avoi	I have lear	Yes. It has	Yes	I may simply medit	-----	-----	-----	-----				3 times a w	40-60 mi	
22	28	Female	36-45	Being at o	4-6 years	No		Friend. I w	At one wit	Toned mu	It has impr	It has shov	Yes	Because I know its	-----	-----	-----	-----				7 times a w	1 hour	
23	31	Female	46-55	It Centers	4-6 years	Yes	2018. I ju	st To gain fle	Relaxed. C	I am so fle	It has ena	The emoti	Yes	I don't feel as prese	-----	-----	-----	-----			3-6/wk	6 times a w	1 to 1.5	

Table of codes versus interview questions

Questions	access	balance	community	downstream	embodiment	intention	lens	mind-body	OTM	practice	presence	self-awareness	SR
<i>Balance</i>		4											
<i>Change over time</i>	1			1	9		5	1			1	7	6
<i>Choice of yoga style</i>	1			2	2			2		2			5
<i>Courage: additional Q "You mentioned the word courage earlier when you were talking about your practice?"</i>							1						1
<i>Diet: additional Q "has your diet changed over the years?"</i>													
<i>Future Practice</i>					1					11			7
<i>Goal/Intention</i>					3	1	2			2	1	1	2
<i>Habit Strategies</i>	3						1						13
<i>Home practice</i>	1		1							1			2
<i>Impacts of Practice</i>				22	13		10	4		2	2		23
<i>Meaning of practice</i>				2			1					1	1
<i>Meditation: additional Q "Do you have a consistent meditation practice?"</i>					1						1		
<i>Mindful: additional Q "What does that mean to you?"</i>													
<i>Motivation: post-practice effects</i>				3	1				1				4
<i>OTM</i>		1		11	6		18		1			2	15
<i>Reason for starting yoga</i>	2						6			1		3	5
<i>Reasons get on the mat</i>			2					1					6
<i>Social/Community</i>			8		1					4			1
<i>Supports Lifestyle</i>	1	3		3	4		2	1		1			16
<i>What is Yoga?</i>				2	4		6	1		1			6

Appendix E: Exemplar Table of Theme Fit to Data

Example provided is for Theme 1: Off the mat (Category 1: Impact) with a theme frequency of 65 coded items (from 8/8 interviewees)

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
1 2 3 4 5	Amy	6 to 12- months	N	"... mentally it has really, my mind is now more in a calmer, a better state than what it was before. It's not ego driven. That's probably the biggest bit, not ego driven." "The way I, I sit, the way I breathe, when I'm talking to people right, when I'm talking to the kids, the tone is more ... a construct of calmer tone, like a more open tone. It's not a one-way conversation." "So how I am in my life, I am ... a non-egotistic person."	Mind OTM/Relationship	I am more me. My frame of mind is in a better state - as it was 10 years ago. Life had changed and I was fighting things more than embracing. ... yoga teaches me to let go of things that are not serving you today. To think of your intentions. It has re-kindled the real me, re-kindled my zest for life on a deeper level. It took yoga to allow me to find myself more.	Perspective
6 7 8	Amy			"I think when I argue with my husband I'm probably more calmer, and I walk away, come back ... " "... when my siblings and I had fights you know. ... I just suppressed, and I didn't deal with it. So it was a lot of that anger release, that real anger. So that needed to come out. So in my life now I've got a lot of fresh air, you could say, in me now."		When working, with family life, with parents - it keeps me [ego] at bay.	OTM

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
9	Amy			"It has made me appreciate life even more. Just gratitude for the breeze and the trees...."	Lens: gratitude		Perspective
10 11	James	>10-years	N	"... you might be a little bit stressed out with modern living and ... So you just relax and you just let the, you know, the practice take over and forget about what's going on, because ... a lot of things you worry about you can't help anyway. So just to let them go and come out. And they have gone after the session."	Coping	Am calmer and happier.	Perspective

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
12 13 14 15	Liam	6 to 12- months	N	"maybe [Yoga] just helped accelerate that things weren't right, and there wasn't that ... there was a disconnect between my job and who I was ... " "... it's getting me to erm ... you know, think about wider issues. About how I relate to people, and what my job means to me, and what my family and relationship means to me." "So I kind of think ... about death sometimes and ... how that might come about and, and being scared that if I don't find what I'm here to do in life and my meaning in life ... I think yoga is a tool for maybe helping me navigate that space."	OTM/Relationship	I think it is giving me great resilience and energy. I feel like I can tackle the demands of work better and that it is helping me to put my life into perspective and that I'm working too much and need to (somehow) change jobs.	OTM

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
16 17 18	Liam			" ... interestingly, one of the earlier impacts was a feeling of dissatisfaction. So I've always kind of been somebody who'll go with the flow and not rock the boat ... and that's probably more my tendency. But I'm finding myself, now if I'm dissatisfied with something, or you know somebody or some situation, I'm more likely to, to speak up about it or find a way of, of dealing with it. ... I think maybe that dissatisfaction's an interesting thing, 'cos it's getting me to I think it's making me calmer."	Lens/OTM	I also at times feel angrier, like my feelings are more authentic, less dumbed down. [Practice when don't feel like it] Yoga helps me face myself. ... I practice when I don't feel like it because it is my best chance of being honest with myself.	Perspective

19	Liam			"I guess it's giving me an optimism. Or helping me to feel more optimistic."	Mind/Perspective	Mentally, I feel better in my skin, and I have more hope that I can change my personal situation.	Perspective
20							
21				"I'm sure it's making me calmer and it's getting me to think about my future and, and how I can potentially influence my future. Whereas I think before I was always too scared to go there."		I have more hope for my future wellbeing because of yoga.	
22							
23				"... it's getting my, trying to get life more into perspective about where I fit in to life. ... I think yoga is helping me just, yeah, put things in perspective. ... that's kind of the influence yoga is having on my life."		I think yoga is helping me to put my life into perspective.	
24							
25							
26				"So I'm kind of trying to consciously create my life and the circumstances around my life more now. And I think yoga is ... Yeah yoga has probably contributed significantly to that way of thinking and thinking more about possibilities ..."			
27				"And it has probably spurred me to start thinking more about 'erm ... trying to refine my spiritual beliefs. ... I'm more interested now in looking after that. That much deeper something than just looking after my body... "			
				"... it's brought ... that spiritual side of it that, that probably I kind of thought			

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
				would be there, but didn't know what it meant. ... So it's just really giving me something else that, that that kind of physical program at the gym wasn't ... really giving me ..."			
28 29 30	Libby	>10-years	Y ²⁰⁰	"I'm sure it makes me happier." "...I used to set [physical goals] ...I was going to do a head kickstand or do lotus ... I'm very keen to stay away from not doing that. ...I don't like the mindset of ... having a goal that's an end product..."		I have noticed that if I do not practice yoga for more than two or three days in a row, I tend to feel more anxious and less tolerant.	Perspective

²⁰⁰ Teaches 1 class per week: "I see myself as a student much more than a teacher." (Online survey response)

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
31 32	Libby					I also consider yoga practice 'off the mat' especially through an awareness of my actions and responses and the impact they may have on those around me. I think, overall, yoga helps me to be emotionally aware. I feel like I can respond to stress with a feeling of calm and I have the ability to think problems through rather than to panic when something goes wrong. I like to think that yoga, ... supports me to do this.	OTM

33	Gwen	18-months to 2-years	N	[Yoga translates OTM] " ... With	OTM	Find it easier to contact a	OTM
34				difficult work. Situations or interactions.			
35				... sometimes the realisation comes into			
36				light with, just with interactions, I think,			
37				and also when my inner critic is really			
38				active. It won't be too long before I			
39				come back to that kind of, where I get			
40				kind of challenged to reappraise what's happening."			
				"The importance of breathing ... or the, the quality of breathing and how it can be such a useful tool at any time ... And that it's ... always accessible. ... I can use that [awareness of breath] when I'm not doing a so-called yoga practice, I can use that ... I can access that off the mat or outside of the practice."		It provides hope and [the practice] encourages itself. ... mainly equips me with tools to meet my life more fully. [Promote yoga] Life changing - take it anywhere life tools ... become more attuned to the play of things gives choices.	
				"... because the experience I have with the practice ... gives me an orientation to the rest of the other things I involve myself with. ... it just feels like it strips everything else away. And so it creates that kind of core. And the other things I do in my life come from that."			
				"I think it gives my life structure. ... It's kind of like a, it organises the rest of my life ... in terms of what it offers me, that practice offers me."			

41	Gwen			"I can detach more. And really this has more recently happened ... with that more consistent yoga practice. ... I put the progression down to that consistency of ... continual experience in a way that makes that grounding ... more reliable and more accessible." "So it's given me [an] orientation that I can detach from my particular inner dialogue and ... my sense of identification with good and bad things or, you know, like [a] strong sense of drawing towards things and strong aversion." "I think I'm probably more tolerant. ... and probably confident, ... a sense of being not who I think I am, or not who other people think I am ... I've struggled a lot in my life with not feeling good enough, or not feeling enough ... that's kind of my default mental construct. ... So I think that it's more ... recently, when I've been able to let go, [of] that go-to ..." "I feel like that sense that I get through yoga enables me to reconnect with something that's beyond who I think I am ..."	Lens: Detachment/ Grounding Lens: Detachment Lens: Spiritual		Perspective
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	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
				"... it's given me a stronger access to ...To a sense of ... being outside myself, outside a sense of self."			
46 47 48 49 50	Gwen			"... it kind of just provides the platform from which I regard the rest of my life. ... I feel like it has the sense of being underneath, kind of creating that kind of ground." "It was kind of 2D in the past, I feel, and I feel like it's got more shape and colour, you know, more 3D now." "... it's kind of like surfing. ... It allows me to surf my life. So it gives me a sense of freedom." "... it just feels like it strips everything else away. And so it creates that kind of core. And the other things I do in my life come from that." "I think it gives my life structure. ... It's kind of like a, it organises the rest of my life ..."	Lens: perspective		Perspective

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
51 52 53	Cleo	18-months to 2-years	N	"I just cope with life a lot better. Like the challenges seem more like I can do it. And I think part of that is because when I go in the room, and I do the things I know are hard, I feel like I'm achieving that. So then I feel like I can achieve things outside of the room ... I just feel more capable of what I can do, because of what I've done in [the yoga room]." "I'm just becoming more ... open to other types of yoga. ... So that's a different mindset I think for me now. I wouldn't have been brave enough to do that ... Now I feel more confident ... to do different things."	OTM	I feel it has given me inner strength and confidence.	OTM
54 55	Cleo			"So I feel like that in my life, so many things are connected ... Like it fits, who I am, because ... it shows that everything's connected." "It just makes everything make a bit more sense (laughs)."	Lens: perspective		Perspective

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
56 57 58	Marsha	>10-years	N			[Practice when don't feel like it] Because I know that practice, even for just a little bit, will help connect me back into myself or ground me. I feel supported by my practice because I know that whatever life throws at me, a yoga session or three will help calm, focus and reenergize me. [Feel after session] Supported; fearless; ready to face anything that comes my way.	Perspective

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
59 60 61	Evelyn	>10-years	Y	"I guess you would say that things don't phase me ... nothing really phases you. ... I find my practice so much more challenging than life itself. ... There's actually nothing that you cannot solve, that you cannot do." "...having babies has been a bit crazy because you just can't control anything having children (laughs). So that's your yoga, to me, ... that's our yoga in terms of mind and mental ability."	OTM	Sometimes when I'm cranky, hubby would ask me if I've been to yoga lately. I think that says everything ...	OTM

	<i>Identifier Pseudonym</i>	<i>Practice Tenure</i>	<i>Yoga Teacher (Y/N)</i>	<i>Participant Quote</i>	<i>Initial Thoughts</i>	<i>Online Survey Themes: Repeated &/or Additional</i>	<i>Final Phase</i>
62 63 64 65	Evelyn			"I think it's changed ... more open and more accepting." "I guess you would say that things don't phase me ... nothing really phases you. ... There's actually nothing that you cannot solve, that you cannot do."	Lens: acceptance Lens: self-efficacy	It has certainly helped with identifying my anger triggers around my young kids. In the adult world and corporate world, I think yoga has enabled me to maintain a relaxed, non-judgmental, non-aggressive approach to stressful situations ... It teaches me to persevere and strive to achieve. It has taught me that I can do anything so long as I manage myself well, avoid unnecessary injury/hurt and remain humble.	Perspective