# An Investigation into Time Pressure, Group Cohesion and Decision Making in Software Development Groups

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## Abstract

*Two of the key themes in contemporary information systems development (ISD) literature are (i) how to build and release systems in shorter time frames and (ii) how to enable development groups to build systems in a cohesive manner. This is reflected by today's predominant contemporary ISD methods such as agile, their distinguishing feature being an explicit emphasis on continuous, timely releases and a facilitation of effective group collaboration and communication. In a survey of 119 software developers we explore the effects of group cohesion and two types of time pressure, hindrance and challenge, on the decision-making quality of ISD groups. Our results showed challenge time pressure and group cohesion to have a positive effect with hindrance time pressure having no significant impact. We discuss the implications of this and offer insights with respect to theory and practice for those wishing to improve the decision-making quality of their ISD groups.*

**Keywords**

decision making, group cohesion, time pressure, agile methods, software development

## INTRODUCTION

The introduction of agile methods over a decade ago has seen a fundamental shift in the way software is development worldwide (Dyba and Dingsoyr, 2008). Agile methods are now a main part of the methodological toolkit for most development houses and have become a ubiquitous part of the software development process. One of the most fundamental changes from the traditional waterfall model of development is the emphasis on group decision making. Indeed, getting agile software development (ASD) groups to work together in a cohesive manner to produce quality software is viewed as *the* most fundamental issue facing organisations wishing to implement an agile methodology (Gartner, 2009). While ASD requires group members to work closely together to make important group decisions in time-boxed iterations (Conboy, 2009; Moe et al., 2012), research in software development has not paid close attention to how these groups actually work together and whether or not this can influence the quality of their decisions.

As well as working together in a cohesive group, short, time-boxed development cycles mean that ASD groups must also work under varying degrees of time pressure (Moe and Dingsoyr, 2008). Most studies in the field of information systems development (ISD) on time pressure measure time as a linear construct and quantify it in terms of time elapsed (Saunders, 2007). One of the major issues with these studies however is that they often produce paradoxical results and as yet, there is no agreed and complete theoretical understanding of the time pressure construct (Saunders, 2007). For example, some results suggest that software development groups perform better under time pressure (Austin, 2001). Yet others suggest that groups perform better up to a certain

point after which performance declines, leading to the widely accepted inverted-U model (Nan and Harter, 2009). It is clear that time pressure is a complex construct and while mostly examined as a linear construct, nonlinear relationships are possible (Mitchell and James, 2001). With a current emphasis in ISD and in particular ASD on group decision making in pressurized environments it is imperative that researchers continue to gain greater understanding of the human behavioural aspect of the decision-making process (Baskerville and Pries-Heje, 2004; Chang et al., 2013). Understanding how groups work together under time pressure is a key goal for IS researchers (Austin, 2001; Nan et al., 2009) and more research is required to fully understand this complexity and help understand exactly how and if time pressure and cohesion impact software development groups (Saunders, 2007). The first objective of this study is to add to our theoretical understanding of time pressure in ISD environments. To do this we measure time pressure as a two-dimensional construct, something to the best of our knowledge, that has not been done before in IS research. We then use this to test the relationship between perceived time pressure and decision consensus and confidence in software development teams, examining the concept of perceived time pressure as a two-dimensional construct composed of challenge and hindrance time pressure (Chong et al., 2011; Lepine et al., 2005).

Another major issue is that the extant literature in ISD on time pressure and decision-making quality focuses on contextual factors such as group decision support systems (GDSS) use, task complexity, team proximity etc. with group cohesion used as the dependent variable (Bowman and Wittenbaum, 2012; Espinosa et al., 2007; Maule et al., 2000). The general assumption being that improved group cohesion will lead to improved decision quality and improved group performance (Licorish and MacDonell, 2014). While there have been major technological advances in GDSS, the behavioural side of the decision making process lags behind the technology, with decision makers oftentimes not using the technology at their disposal, therefore reducing the actual impact of GDSS (Appelt et al., 2011; Kayande et al., 2009). Groups and GDSS can complement each other during the decision-making process; however, the technological advances made may be underutilized if the human characteristics of the decision-making process are not fully embraced (Denning, 2013; Grudin, 2002; Nissen and Sengupta, 2006). While current studies are useful, they rarely, if ever focus on the mitigating or enhancing effects of human characteristics or behavioural aspects such as group cohesion. The second objective of this study therefore is to examine some of these critical behavioural aspects by investigating the effect of group cohesion on decision quality and the time pressure-decision quality relationship.

The remainder of the paper is structured as follows. In the next section we review the literature on time pressure and group cohesion. After this, we present our research model and our hypotheses. We then describe the research design and data collection process followed by the results of our hypotheses testing. Finally we discuss the findings and contributions suggesting potential avenues for future research.

## THEORETICAL BACKGROUND

As groups and group work begin to become a more fundamental part of organizations (Mathieu et al., 2008), modern environments requiring operational agility utilize group-work as a means of achieving this flexibility while remaining economically efficient (Tannenbaum et al., 2012). Within the management and organizational literature there is a general trend towards more empowering and autonomous groups and a move from command-and-control to member-led leadership. More shared leadership within the group is driven by the belief both that self-management is motivational, empowering and engaging and also by the economic need for leanness (Tannenbaum et al., 2012). As groups become more self-managing they begin to take on greater decision-making responsibility. The decisions made by the group will often have a critical impact on both the project success and other less tangible aspects of the development environment, such as group learning (Brodbeck et al., 2007), satisfaction (McNamara et al., 2008), participation (Yoo and Alavi, 2001) innovation (De Dreu and West, 2001), and creativity (Watson et al., 1993).

### Group Cohesion

Although there have been many technological advances to aid with group decision making, group dynamics are ingrained in human nature through millions of years of evolution and these dynamics are often unsusceptible to change and inaccessible to conscious awareness (Grudin, 2002; Kock, 2009). Research shows that group cohesion will have an important impact on decision quality, yet, as highlighted earlier, research tends to focus on technology aspects and task complexity rather than group characteristics (Appelt et al., 2011) and group decision-making is one of the under researched areas within both the general decision-making literature and the ISD literature in particular. Research on group decision-making highlights the interplay between the task complexity, collaboration system usage, the decision making environment and group composition, noting the effects these constructs have on decision quality (Nunamaker et al., 1991).

Many meta-analyses have been published on the cohesion–performance relationship (Beal et al., 2003; Carron et al., 2004). The general conclusion stemming from these studies is that the correlation is moderate, positive, and highly dependent on intra-group processes (Chiocchio and Essiembre, 2009). However, a study by El-Shinnawy et al. (1998) found that group cohesion had no impact on the decision quality. Their study does not rule out the importance of group cohesion as they control for factors such as group size and history and call for future research to further examine the group cohesion construct. Others have used the group attitude scale (Evans and Dion, 1991) to measure group cohesion and the results indicate a positive impact on group consensus (Yoo et al., 2001) and user satisfaction of group support system technology (Chidambaram, 1996). Schwarz and Schwarz (2007) show that group cohesion predicts enjoyment and effectiveness but did not have an impact on the efficiency of the group, whereby efficiency was measured by the time it took to come to a decision. So while early work on group cohesion revealed no relationship between group cohesion and group performance (Deep et al., 1967), recent work has found that there is indeed a relationship between group cohesion and task performance, with members of established groups formulating varying levels of cohesion over time (Schwarz et al., 2007).

**Time Pressure**

Measuring time pressure has received a lot of attention in both the management and management information systems literatures (Ancona et al., 2001; Arrow et al., 2004; Mitchell et al., 2001; Saunders and Ahuja, 2006; Street and Ward, 2012; Zaheer et al., 1999). While the ability to make quick decisions and take fast actions is usually seen to be beneficial to organizations (Forbes, 2005), a review of the literature on time pressure and decision quality shows that the relationship is not straightforward (Hwang, 1994; Maule et al., 2000; Saunders, 2007). Time pressure can have either a positive, neutral of negative impact. For example, previous studies showed that quick decision making helped individuals and groups improve information processing and coordination (Hwang, 1994; Kerstholt, 1994). Others highlighted the economic benefit to rapid decision making (Baum and Wally, 2003). Maule (2000) found that time pressure led to increased anxiety, increased energy and those under time pressure worked harder and used a number of different strategies to cope with tight deadlines. Austin (2001) found that setting aggressive deadlines for software development teams actually eliminated shortcut-taking and improved quality.

Time pressure does not always have a positive impact on decision quality. For example, Sethi (2000) found no statistical significance between time pressure and quality. Nan (2009) also found that time pressure had no significant impact on software development outcomes. Rapid decision making has also been shown to have a negative effect on decision quality (Waller et al., 2002). Perlow et al. (2002) found that the tendency to rely on past decision-making strategies is greater when there is time pressure to make quick decisions. This can result in the same mistakes being made and learning being inhibited. Perlow et al. (2002) show that time pressure helped some groups but hindered the performance of others. Kelly (1999) found that the initial preference of the group making the decision was enhanced when the group was put under time pressure. Therefore, when a group has an initial inclination towards a specific decision, whether that decision is the correct one or not, putting them under time pressure will increase their preference towards that initial decision.

Bowman and Wittenbaum (2012) divided time pressure into low and high time pressure and found that decision quality was better for groups operating under low time pressure. Chong et al. (2011) also differentiated between low and high time pressure arguing that decision makers use different tactics to deal with pressure depending on the nature of stressors experienced; that is, people who view stressful situations as potentially beneficial tend to take proactive actions while those who view stressful events as potentially threatening tend to withdraw from or be passive in pressurized situations. They use a framework from (LePine et al., 2004) to conceptualize time pressure as challenge or hindrance time pressure, where challenge time pressure produces a positive reaction and hindrance time pressure produces a negative reaction. Their study found that challenge time pressure improves quality and hindrance time pressure deteriorates quality. In complex tasks such as those faced by software development groups, the group can become more concerned with reaching a consensus or reaching a decision quickly and less concerned with other goals such as decision quality or systematically evaluating alternatives or more creative decisions (Kelly and Loving, 2004). It is obvious from time pressure studies to date that the impact of decision speed is not fully understood and there appears to be a trade-off between decision speed and high quality decision-making.

**Decision Quality**

The decision-making literature uses the terms ‘decision accuracy’ and ‘decision quality’ somewhat interchangeably, usually describing the same thing. In this regard decision quality is understood as “the deviation of a particular solution from the solution that would be provided by a normative strategy, such as expected value maximisation or utility maximisation” (Todd and Benbasat, 1991), and is essentially equivalent

to decision accuracy. Elsewhere, decision quality is taken as a superset of accuracy (Moldafsky and Kwon, 1994), and in addition to the accuracy of the decision, can encompass more perceptual aspects of the decision outcome and process from the decision maker's perspective, such as perceptions of confidence in the decision, or subjective agreement with the decision process or outcome. Other studies measure decision quality using outcomes such as, consensus (Cooper and Haines, 2008; Yoo et al., 2001), quality (McNamara et al., 2008), learning (Brodbeck et al., 2007), satisfaction (Dennis, 1996), participation (De Dreu et al., 2001), innovation (De Dreu et al., 2001), accuracy (Speier and Morris, 2003) and creativity (Watson et al., 1993). While a number of indicators of decision quality are used in previous studies, two of the major indicators of decision quality that have emerged from the literature review are decision confidence (Schwarz et al., 2007) and decision consensus (Salisbury, 2002; Yoo et al., 2001; Cooper & Haines, 2008). Decision confidence relates to how the group view the choice they have made. The higher the amount of confidence one has in a decision, the higher is the strength of belief and trust in the decision (Adidamm and Bingi, 2000; Bingi et al., 2001). It is often not be possible to measure the actual final outcome of that decision but measuring the decision confidence should provide a good indication about how positively the group feels about a decision. Decision consensus relates to how the group as a whole understood the reasons for the decision. High consensus will result in complete group buy-in and represents high group participation in the decision-making process. Given the importance of decision confidence and decision consensus we have selected these two indicators as prime examples of decision quality.

## RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

Overall the research on time pressure and decision quality has produced many conflicting results, reflecting the fact that people react in different ways to time pressure. This inconclusiveness has not helped establish a well-informed theoretical basis for studying time pressure in software development teams. Indeed, much of the research surrounding time pressure and decision quality is conducted in environments other that software development and it is difficult to assess these finding relative to software development groups. Despite the importance of group decision making within software development organizations and the current trend towards speedy decisions, there is a paucity of literature examining the effects that both group cohesion and decisions speed have on the decision quality (El-Shinnawy et al., 1998). Given the importance of group cohesion to software development (Gartner, 2009) it is important that researchers examine the group cohesion construct and how it impacts the overall performance of software developer groups. Many researchers have called for studies to examine how group cohesion effects the decision quality of software developer groups, particularly under conditions of time pressure (Drury et al., 2012; Moe et al., 2012). Our study answers this call and based on the theoretical overview discussed we developed our conceptual model for this research (Figure 1).

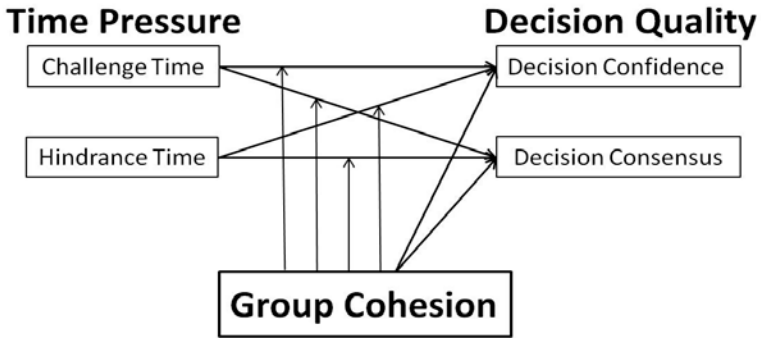


Figure 1 Research Model

## EFFECTS OF TIME PRESSURE

Past research has often associated the relationship between time pressure and performance with the inverted-U concept (Sturman, 2003). The concept relies on a one-dimensional and linear understanding of time pressure with performance improving until the pressure perceived reaches a tipping point, i.e. the top point of the inverted-U, after which the perceived pressure becomes a hindrance rather than a facilitator of performance. While popular, the inverted-U may explain why there are such varying results on the impact of time pressure on performance. Each study on time pressure leave itself open to the possibility of being at any one point along the inverted-U. Given these challenges we use a two dimensional construct to measure time pressure, challenge and hindrance pressure. Challenge time pressure is the degree to which a group perceives time pressure as a stressor which promotes goal achievement, while hindrance time pressure is the degree to which a group perceives time pressure as a stressor which constrains goal achievement (Chong et al., 2011). By using this two-dimensional construct we can measure how groups perceive time pressure. This pressure may be objectively similar for different group but each group's perception of time pressure may vary.

**Effects of Challenge Time Pressure**

Insights from goal-setting theory show that challenging goals are a strong motivator and help a group focus its' activities on achieving the goals they perceive are attainable (Locke and Latham, 2002). When group members are motivated to achieve a goal they exhibit improved information processing and coordination characteristics in order to reach decisions quickly. Goals that are perceived to be challenging and attainable heighten group performance by motivating the team to invest effort into discovering, devising and using tactics that facilitate task accomplishment. Evidence suggests that when groups perceive the pressure to be challenging; they will be stimulated and will focus their efforts on reaching decisions quickly. While making speedy decisions often has a negative connotation, such as neglecting important information, when the group feels motivated they will process information quicker and take into account salient cues relative to the decision that needs to be made. Studies have shown that challenge time pressure is seen as a positive stressor and enhances group performance (Chong et al., 2011; Chong et al., 2012; Podsakoff et al., 2007). Groups that perceive themselves to be under challenging time pressure will adopt problem-solving approaches to achieve quality and timeliness. Under conditions of challenge time pressure (i.e. a pressure that promotes goal achievement) we hypothesize that groups will work with each other to produce the required decision. Therefore we hypothesize the following:

*H1a: Challenge time pressure will be positively related to decision confidence in software development groups*

*H1b: Challenge time pressure will be positively related to decision consensus in software development groups*

**Effects of Hindrance Time Pressure**

Once a group perceives that a goal is no longer achievable within an allocated time, motivation drops and performance suffers. Under conditions of hindrance time pressure (i.e. a pressure that constrains goal achievement) groups will tend to reduce coordination activities, accept the choice of a single group member and polarize quickly around that choice to produce the required decision (Cheng and Chiou, 2008). Although time pressure can lead groups to process information quicker, focus on relevant information and not waste time, where decision making has a time relevance or a time criticality, for example, allocating resources to a team with an impending deadline, satisficing may be exacerbated. In such scenarios getting the right information and making quick, accurate decisions is problematic with decision time pressures increasing the likelihood of decisional errors (Aminilari and Pakath, 2005). Important information may not be processed or exchanged and the quality of the decision is likely to suffer (Kelly et al., 2004). Studies show that people will close their minds to additional information under conditions of hindrance time pressure (Kruglanski and Webster, 1996). When feelings of frustration and negativity exist group members may not actively participate in the decision-making process and will be less confident of the decision-making quality. Less information is exchanged, relevant advice is ignored and minds are closed to additional information. Taking these into account we hypothesize that:

*H2a: Hindrance time pressure will be negatively related to decision confidence in software development groups*

*H2b: Hindrance time pressure will be negatively related to decision consensus in software development groups*

**Group Cohesion**

In an ideal ISD project, all relevant information is collected and the group comes together in order to make decisions. When disagreements happen or when all relevant information is not available to make informed decisions the group will often need to rely on certain decision makers to play a defining role in the group decision (Holmstrom and Sawyer, 2011). When groups members have a strong attraction to their group they will place emphasis on shared group commitment to tasks and group membership (Beal et al., 2003). This indicates that, regardless of the time pressures placed on the group tasks, group members will share the commitment to group decisions and outcomes. Group cohesion is the extent to which a group is attracted to the group and to each other (Chidambaram, 1996). A cohesive group has strong emotional, social, task and perceived cohesive attractions and will work together to produce better quality decisions (Forsyth, 2006). Studies show the beliefs held by members of a group will interrelate and shape the decision making process of the group (Bartis and Mitev, 2008). We therefore hypothesize that:

*H3a: Group cohesion will be positively related to decision confidence in software development groups*

*H3b: Group cohesion will be positively related to decision consensus in software development groups*

*H4a: The effect of challenge time pressure on decision confidence will be moderated by group cohesion such that the negative effect is lower when cohesion is higher*

*H4b: The effect of challenge time pressure on decision consensus will be moderated by group cohesion such that the negative effect is lower when cohesion is higher*

*H4c: The effect of hindrance time pressure on decision confidence will be moderated by group cohesion such that the negative effect is lower when cohesion is higher*

*H4d: The effect of hindrance time pressure on decision consensus will be moderated by group cohesion such that the negative effect is lower when cohesion is higher*

## RESEARCH METHODOLOGY

A survey instrument was developed to collect the quantitative data needed to test our hypotheses. We contacted 50 software development organisations from an internally compiled database of suitable candidates and asked project managers to distribute the survey link to their software development groups. 15 companies responded resulting in the 119 usable results. The data analysis was performed using SPSS (version 21) software.

### Measures

Challenge and hindrance time pressure was measured using a scale developed by Chong et al. (2011). Challenge pressure was measured by four items and hindrance pressure was measured by five items. Participants were asked to indicate how much time pressure they experienced as a result of each item. Items were scored on a seven-point Likert scale ranging from 1 (*not pressure at all*) to 7 (*extremely positive or negative*). An example item for challenge pressure is "making the estimation decision in the time allowed" and an example item for hindrance pressure is "constant switching between tasks for the group in a day". Group cohesion was measured using the group cohesion scale from Schwarz and Schwarz (2007) and Forsyth (2006). Cohesion was measured by nine items using a seven-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). An example item for group cohesion is "I am happy to be part of this group". Decision quality was measured using the decision consensus scale from Cooper and Haines (2008) and the decision confidence scale from Schwarz and Schwarz (2007). Confidence was measured by eight items and consensus was measured by five items with both using a seven-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). An example item for decision confidence is "I am sure our estimation decisions are appropriate" and an example item for decision consensus is "Our group reaches a mutual understanding on how we should make estimation decisions".

## RESULTS

Cronbach Alphas for decision confidence, consensus, group cohesion, challenge time pressure and hindrance time pressure were .92, .94, .91, .79 and .76 respectively. The alphas are all higher than the recommended threshold and were sufficient to conclude that the measures were reliable (Nunnally and Bernstein, 1994). We carried out a factor analysis using Varimax rotation: although the Scree plot suggested 3 components, items tended to load across 2 or sometimes all 3, indicating a significant level of overlap between the components. As such, we treated cohesion as a single overarching construct for the purposes of our analyses. Means, standard deviations and Pearson correlations of all study variables are presented in Table 1.

Table 1. Means, Standards Deviations and Correlations

| Variable | M | SD | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 1. Decision Confidence | 4.85 | 1.78 | | | | |
| 2. Decision Consensus | 5.12 | 1.20 | .82** | | | |
| 2. Challenge Time Pressure | 4.88 | 1.01 | .56** | .62** | | |
| 3. Hindrance Time Pressure | 4.29 | 1.05 | -.06 | -.13 | -.16 | |
| 4. Group Cohesion | 5.39 | 1.06 | .66** | .67** | .57** | .04 |

Challenge time pressure was positively related to decision confidence ($r=.56$, $p<.01$) and decision consensus ($r=.62$, $p<.01$). Hindrance time pressure did not significantly correlate with decision confidence or decision consensus. Group cohesion was positively correlated with decision confidence ($r=.66$, $p<0.01$) and decision consensus ($r=.67$, $p<0.01$).

### Hypotheses testing

We used linear regression to analyse and test our hypotheses and created the interaction terms to test the moderating effect of group cohesion. Two of the three variables were significant predictors of decision confidence, with adjusted $R^2 = .47$, $F(3,115) = 37$. For the second dependent variable, decision consensus, two of the three variables were again significant predictors, with adjusted $R^2 = .54$, $F(3,115) = 46$. Hypotheses 1a and

1b which examine the relationship between challenge time pressure and the decision quality dimensions were supported (β = .27, p<.01 for decision confidence and β = .62, p<.01 for decision consensus; see Table 2). Hypotheses 2a and 2b, which examined the relationships between hindrance time pressure and the decision quality indicators were not supported. Hypotheses 3a and 3b, which examined the relationships between group cohesion and the decision quality indicators were also supported (β = .51, p<.01 for decision confidence and β = .67, p<.01 for decision consensus; see Table 2).

Table 2. Regression results predicting decision quality from challenge and hindrance time pressure and group cohesion

| | **Dependent variable** | |
|---|---|---|
| | Decision Confidence | Decision Consensus |
| Challenge Time Pressure | .27** | .33** |
| Hindrance Time Pressure | -.04 | -.09 |
| Group Cohesion | .51** | .49 |
| $R^2$ | .49** | .54** |
| $\Delta R^2$ | .47** | .53** |

To test hypotheses 4a, 4b, 4c and 4d we entered the group cohesion, challenge time pressure and hindrance time pressure variable in the first step followed by the interaction terms in the second. However, none of these four hypotheses received significant support and are therefore rejected.

## DISCUSSION AND CONCLUSION

With a major emphasis on group decision making in the field of ISD, it is of critical concern to software development houses that their development groups are making quality decisions. Despite this criticality, there is a paucity of research in the ISD literature on the optimum conditions under which good quality group decision making is carried out. This study seeks to examine two fundamental underlying concepts in group decision making, time pressure and group cohesion and examines the effect they have on decision quality.

### Implications for theory

Previous research on time pressure in ISD generally focuses on time pressure as a linear construct that has an inverted-U relationship with its determinants. In this study we applied a 2-D structure and adapted recently validated scales to measure time pressure using the challenge-hindrance stressor framework (Lepine et al., 2005). Our findings are consistent with recent results in other fields (Chong et al., 2011) and show that time pressure can have both a positive and negative effect on group decision quality. Time pressure theorists have long argued that time pressure means different things to different groups and in this study we show that when groups perceive the pressure to be stimulating, enjoyable and satisfying they produce better decision quality. On the other hand, when time pressure is perceived as annoying, discouraging and upsetting the group decision making quality does not appear to be effected. This has important implications for future time pressure studies as it is the perception of time pressure not the actual time pressure that demonstrated group decision quality improvements in this study. Another important contribution is the recognition that group cohesion has an effect on group decision quality but does not appear to moderate the relationship. Our hypotheses suggested that group cohesion would moderate this relationship but our analysis could not find any evidence of this. Very little empirical evidence exists examining the factors moderating the effects of time stress on decision quality. This study, while emphasizing the effects of time pressure stressors, begins to examine the group decision making process in a new light, asking questions and opening up new lines of thought on which factors should be classed as independent variables and which should be classed as moderating variables in the group decision-making process.

### Implications for practice

ISD practitioners can use this study as a way to understand the effects of time pressure by understanding the nature of time pressure. Traditionally, ISD managers sought to set delivery goals and incentivize developers to deliver these goals within optimum time frames. Yet, it is widely known that selecting the optimum time frame is not possible in practice given that the optimal points are difficult to determine and tend to differ for differ between individuals. This study shows that groups can perform well under time pressure if they experience high challenging time pressure. Rather than setting time specific goals, managers can try and create the conditions

that allow groups to experience less hindrance and more challenge pressures. Groups may still be able to perform well under intense time pressure as long as they perceive that pressure to be more challenging than hindering.

**Limitations and future research**

Our analysis did not indicate that cohesion acted as a moderator between hindrance or challenge pressure and decision quality but regression testing showed that it did have a significant main effect. While it is not surprising that cohesion has a positive effect on decision quality, it is surprising that it does not significantly improve decision quality under differing conditions of time pressure. Perhaps a reason for this is that this study is limited by the small sample size of 119. Future research should examine the group cohesion construct in more detail by exploring the sub-constructs of group cohesion with larger sample sizes.

Although we do not find significant interaction effects to support our hypothesis that group cohesion moderates the relationship between time pressure and decision quality, group cohesion is a significant predictor of decision quality. It may be possible that group cohesion may be a mediator of the relationship. However, we did not test for this and future research could also explore this possibility.

Group decision making is a fundamental part of recent ISD project methodologies. The findings of this study show that to improve group decision quality, practitioners should re-assess how they perceive time pressure when making group decisions. Time pressure that is perceived as challenging, joyful and satisfying has a strong positive relationship with decision quality. While group cohesion does not appear to moderate the relationship between time pressure and decision quality it does have a strong positive effect on the decision confidence and decision consensus of the group.

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