**THE TIMING OF DISCREPANT INTERRUPTIONS AND ITS INFLUENCE**

**ON TEAM PERFORMANCE**

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A DISSERTATION SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

GRADUATE PROGRAM IN BUSINESS ADMINISTRATION

YORK UNIVERSITY

TORONTO, ONTARIO

NOVEMBER 2014

# ABSTRACT

Discrepant interruptions are inevitable in today's highly dynamic and turbulent environment. Organizations need to handle discrepant interruptions effectively in order to survive. Since organizations mostly rely on teams to do task and achieve goals, teams are required to deal with the discrepant interruptions and modify their plans and strategies to address the interruptions. A team's approach in handling discrepant interruptions has a significant effect on team effectiveness and accordingly affects the organization's performance.

In addition, team development literature suggests that project teams working on a creative task under a deadline engage in task transition during their allotted time (Gersick, 1988, 1989; Waller, Zellmer-Bruhn, & Giambatista, 2002). This dissertation focuses on the timing of the discrepant interruptions with regards to task transition. More specifically, I aim to explore how the relative timing of a discrepant interruption affects how a team works under a deadline.

Building on the literature, I hypothesize that teams facing discrepant interruptions after their task transition would perceive the interruption as a hindrance to their performance, and thus have lower team coordination and performance. In contrast teams who face the discrepant interruptions before their task transition would perceive the interruption as a challenge, and thus have higher team coordination and performance. To test these hypothesis, I conduct an experiment in which teams of three work on a creative task for 40 minutes. Their goal is to create an audio commercial for an existing airline. All teams face the same

discrepant interruption at 20 minutes into the task. I measure their appraisal of the discrepant interruption and team coordination using a questionnaire and code their video for the time lapse of their task transition.

My analysis shows no support for any of the hypotheses except for the positive association between team coordination and team performance. As next step, I present some exploratory analysis on my data and identify a number of interesting findings. I find that teams working on a creative task under deadline go through their task transitions at different times within their allotted time. Teams that have their first task transition before a discrepant interruption have higher performance than others. Moreover, in this setting, teams have lower performance if they make their transition too early or too late. Observing team coordination, I find that team coordination positively affects team performance given the context I created. Finally, exploring team members' pacing style, I find that, for teams delaying their task transition until after a discrepant interruption, having a deadline action style increases team performance.

To *Maman* and *Baba,*

who believed in me and taught me to believe in myself.

# ACKNOWLEDGMENTS

Completing the Ph.D. program has been the most challenging and memorable journey of my life, so far. I was very lucky to be surrounded by a wonderful group of people, who have been my source of support and inspiration during this journey. I would like to take this opportunity to thank them. First, I am deeply grateful to my supervisor, Professor Mary waller, for her tireless support and guidance, for all the encouragement she has given me, and for her many inspiring and insightful ideas. Mary, you have been an amazing supervisor and a great friend. Your dedication to research excellence and your great caring personality sets an example I aspire to follow.

Second, I am very thankful to my committee members, Professor Rekha Karambayya and Professor Gerardo Okhuysen, for their helpful advice throughout my research. I always enjoyed my meetings with Rekha and was impressed by her kindness and attention to details. I always left her office wondering how her attitude and compassion makes me calm and confident. I was incredibly fortunate to get to know Gerardo, a great scholar with a wonderful personality. He is certainly a great role model for anyone in academia who wishes to impress the world with the quality of their work as well as their determination to support everyone around them and help everyone to grow. I would like to thank him for his enlightening questions and comments and taking the trouble to come a long way to attend my Ph.D. oral defence.

I also like to thank my internal and external examiners, Professor Alberta Pos and Professor Susan Mohammed, for their suggestions and feedback on my work. They both challenged my ideas in the most caring way and gave me new avenues to think about. I also like to extend my gratitude to Professor Hazel Rosin, for serving on my oral defence committee.

During the years I have been at Schulich, I had the pleasure of meeting many bright people. I would like to thank Professor Christine Oliver, Professor Kevin Tasa, and Professor Chris Bell. I will always cherish our pleasant and informative discussions. I am indebted to my friends in our area, Wesley Helms, Luciana Turchick Hakak, Marzieh Saghafian, Madeline Toubiana, Sean Buchanan for the enjoyable discussions we shared. My special thanks goes to the wonderful staff in Organization Studies area: Tammy Tam, Silvana Careri and Carla D'Agostino, for making the Ph.D. experience an enjoyable one.

Going through this process would not have been possible without the emotional support from my friends outside the university. Golchehreh was a true friend who was sitting right there where my professional life and personal life reached each other. We cried, laughed, and grew side by side during our Ph.D. journey. She was always there to hold my hands, listen to all my complaints, and cheer me up with her great heart. Thank you, Golcherhreh! Somayeh, Afsaneh, Hossein, Reza, thank you for the endless support and encouragement. It is hard to find the words that reflect my feelings toward you. You have been my family and my secret treasure during all these years in Canada. I am also incredibly grateful to my dear friend,

Afra, who did not stop cheering me up even from thousands of miles away. You have such a talent, Afra!

It goes without saying that I am forever indebted to my wonderful family, who are my greatest emotional support and who cheered for me throughout this journey. Maman and Baba, any achievements I make in my life is certainly yours. Thank you for believing in me. Your love made it possible for me to endure any hardship in my life. Elnaz, you are not only my beloved little sister, but also my best friend forever. Thank you for making my life more colorful since the day you opened your eyes and thank you for bringing Ali and Mana to my life.

And last and most of all, my heartfelt gratitude goes to my beloved husband, Iman, and my precious girl, Nikki. Iman, I love how we grow together year by year, hand in hand. Thank you for giving me the love, support and confidence I need. You made this possible for me. Nikki was the most significant discrepant interruption I faced during my PhD! But, I did not know that the interruption can become my biggest motivation to continue and achieve. I love you, my girl! Thank you for showing me how much my heart can extend.

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**CHAPTER ONE: INTRODUCTION**

In their highly dynamic and complex environments, organizations increasingly rely on groups[1] to perform complex tasks and adapt to unexpected situations. Teams are responsible for decision making and execution at multiple levels of organizations, from strategic decisions made by the board of directors to tactical decisions made by sales and operations teams. As such, group performances can have significant impact on the success or failure of organizations. Groups often feel tremendous pressure to complete their tasks within deadline and deal with unexpected situations without negatively impacting their performance. Past research concluded that groups working under deadlines use time and temporal milestones to guide their work and to evaluate their progress on tasks (Gersick, 1994; Okhuysen & Waller, 2002). In a model of group development, Gersick (1988, 1989) focused on groups performing a creative task under deadlines ranging from 60 minutes to six months. She found that groups pay special attention to time at the midpoint of their allotted time, make a major transition at the midpoint in their approach toward their work, and depend on their midpoint agreements to provide a basis for work in the second half of their allotted time. In her studies, the duration of midpoint was very short, mostly 2%-to-3% of the work time. In the second half of the allotted time, groups often engage in executing the performance strategies they have developed at the midpoint transition. At this stage, groups feel pressure to deliver the results by the deadline and are generally unlikely to alter the basic plan developed through the first half of their allotted time and crystallized at their midpoint transition period (Gersick, 1988).

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[1] Throughout this dissertation, the terms *team* and *group* are used interchangeably to refer to a bounded system composed of a set of interdependent individuals organized to perform specific tasks that affect others (Guzzo & Dickson, 1996).

Some scholars suggest that, in the second half of the their allotted time, groups settle into a mode of operation and work steadily until a final push at the end of the project (Gersick 1988,1989), while other scholars suggest that groups increase their work pace as they get closer to the deadline (Waller, Zellmer-Bruhn, & Giambatista, 2002; Lim & Murnighan, 1994). In both cases, scholars presumably imply that, in the second half of their allotted time, project groups working under a deadline stick to the plan agreed to at the midpoint.

The inherent assumption employed above is that either major changes do not occur or groups do not respond to them in the second half of their allotted time. It is simply assumed that after the midpoint, groups focus mainly on executing the plan to meet the deadline. However, unanticipated external events or discrepant interruptions such as changes in availability of resources (e.g., team members, time, information, and material), sudden changes in the task environment (e.g., changes in competitors' actions), or changes in the product requirements inevitably occur in most settings, and often temporarily or permanently prevent teams from completing their organized actions or plans (Rudolph & Repenning, 2002). These discrepant interruptions occur when a team perceives significant inconsistencies between prior expectation and what is happening in the external environment. The discrepancies change individuals' perceptions regarding work conditions and assumptions and, as a result, new plans have to be devised to complete the tasks at hand or address the interruption before continuing with the original plan (Jett & George, 2003). Previous work on team adaptation has examined individual characteristics that predict member and team-level adaptability (e.g., LePine, 2003; LePine, Colquitt, & Erez, 2000) and the team adaptation processes used when teams encounter different external interruptions (Waller 1999; Waller et

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al., 2002). A smaller literature on interruptions has also examined some limited characteristics of interruptions, such as frequency (Rudolph & Repenning, 2002).

Discrepant interruptions can be conceptualized along multiple dimensions, including frequency, source, severity, level of unexpectedness, and timing. While most of these dimensions are likely to affect team adaptation, I am interested in examining the effect of the timing of the interruption occurrence with regards to the task transition on team adaptation. A transition point was defined by Gersick as "*the moment when group members made fundamental changes in their conceptualization of their own work*" (1988: 277). Since time and timing are critical factors in team development and task performance (Gersick, 1988; Okhuysen & Waller, 2002) and team behaviour and processes may be different before and after the task transition, the timing of the interruption occurrence is very likely to affect team adaptation processes, apart from teams' considerations of remaining time resources. More specifically, I am interested in exploring whether and how the team adaptation processes in response to discrepant interruptions are different before and after the task transition. To this end, I define pre-transition and post-transition as the time immediately before and after the task transition, respectively. My research is focused on answering the following questions: How does the team appraise discrepant interruptions pre-transition versus post-transition? Which team adaptive processes emerge in each condition? How does team appraisal of a discrepant interruption affect team performance?

Examining these questions will help researchers and practitioners better understand the adaptive team processes that emerge in response to interruptions, and the effects of these

processes on team effectiveness. It will also help researchers better understand the critical points in a team's project life -- points at which teams are more vulnerable, or more resilient in managing interruptions. Therefore, knowing the effect of interruption timing on team performance will enable organizations to recognize when it is most important to protect the team from external interruptions and when it may be the most opportune time to introduce interruptions.

A number of boundary conditions exist in this study. First, this study, similar to previous related studies (e.g., Gersick, 1988, Waller et al., 2002), is concerned with de novo teams that are working under a deadline. Since the study examines interruptions occurring at different times in a team's allotted time, the study pertains only to teams with deadlines, as there should be a deadline for the task to establish the life span. Second, this study is focused on a specific type of interruption— discrepant interruptions — for which teams must change their plans in order to adapt to the new circumstances and address the interruptions (different types of interruptions are discussed in detail in the literature review section, below). Finally, this study examines the teams that are working on a creative task that involves idea generation and idea implementation (Gersick, 1989).

In the following sections, I will review previous research concerning interruptions in teams as well as the literature on team adaptation. I will then develop hypotheses concerning how the temporal location of an interruption within the team's project life affects team adaptation and performance. In the methods section, I will propose a laboratory study to test the hypotheses. I will analyze the data through the methods discussed in the results section. I

conclude by discussing the limitations and implications of my work and directions for future

research.

# CHAPTER TWO: LITERATURE REVIEW

This study builds on two distinct but interrelated bodies of literature: interruptions and team adaptation. It also borrows one specific concept and one framework from other literature: task transition and the challenge-hindrance framework. I will first review different approaches of defining interruptions at various levels, and then focus on the definition I adopted for this research at the team level. Second, I will examine the studies exploring interruptions at the team level. Third, I will review the existing work on team adaptation. Fourth, I will define and briefly review the research on the topic of task transition. Finally, I will review the challenge-hindrance framework.

## Definition of Interruptions

Interruption has been defined as "something that breaks the uniformity or continuity" (Merriam-Webster's Collegiate® Dictionary, Eleventh Edition). Researchers working at different levels of analysis (individual, group, organization) refer to interruptions as unexpected and uncontrollable events that break the continuity of the primary tasks (Jett & George, 2003; McFarlane, 2002; Speier, Valacich & Vessey, 1999; Staudenmayer, Tyre, & Perlow, 2002). Focusing on interruptions at the individual level, Jett and George define interruptions as "incidents or occurrences that impede or delay organizational members as they attempt to make progress on work tasks" (2003: 494). While most researchers agree on the general definition of interruptions, they have operationalized interruptions differently. These differences stem mainly from the content of interruptions. Jett and George (2003) categorize the existing diverse approaches in the literature into four distinct interruption

types: intrusion, break, distraction, and discrepancies. An *intrusion* refers to unexpected encounters by others that bring work to a temporary stop (e.g., phone calls). A *break* also includes a halt in a task. However, unlike an intrusion, a break refers to anticipated or self-initiated time away from the work (e.g., taking time out to surf the web). *Distractions* divert attention away from the work and are triggered by external stimuli (e.g., hearing loud conversation outside the office). Finally, *discrepancies* occur when an individual or team perceives significant inconsistencies between prior expectations and what is happening in the external environment.

Although all four types of interruptions have been studied under the same label in the literature, they differ in their content and hence their effect on work continuity. In case of an intrusion, break, or distraction, individuals and teams can get back to work on the primary tasks according to the original plan or routine without any plan revisions. However, discrepancies change individuals' perceptions regarding work conditions and assumptions and, as a result, new plans have to be devised to complete the tasks at hand or address the interruption before continuing with the original plan. An example is a student assuming that a paper's deadline is in two hours and realizing that the deadline is (or is changed to) an hour. The student's initial plan of work might not be the best, given the new circumstances and she/he might have to develop a new plan to best manage the remaining time and finish the paper before the deadline. Waller and colleagues (2002) provide a good example of discrepancies at the team level in which groups' deadlines change and groups correspondingly modify their plan to address this change.

Focusing on interruptions as discrepancies and in line with Mandler's interruption theory of stress (1982), Rudolph and Repenning (2002) also define interruption as "any unanticipated event, external to the individual, that temporarily or permanently prevents completion of some organized action, thought sequence, or plan" (Rudolph & Repenning, 2002: 6). Although Rudolph and Repenning (2002) defined interruption at the individual level, they developed a single interruption model that explains a set of dynamics at multiple levels of analysis, namely individual, group, and organization. Their model explores the effect of interruption quantity and is discussed in detail in the following section.

Interruptions are the events that break the continuity of the work. The work can be done either by individuals, teams or organizations. Although the effect of the interruption on each of these levels might be different, the definition of interruption is still the same. For example, the interruption of a change of deadline can happen to any individual, team, or even an organization responsible for a task. Therefore, the definition of interruption can be applied to any level of analysis. However, the interruption's effects are different at each level due to the differences in capacities, processes, and interactions at each level (e.g., for individual level: McFarlane, 2002; Speier et al., 1999; Zijlstra, Roe, Leonora, & Krediet, 1999; for group level: Okhuysen, 2001; Okhuysen & Eisenhardt, 2002; Zellmer-Bruhn, 2003). Interruptions as discrepancies at the team level in some cases have also been recognized as non-routine events (e.g. Waller 1999).

In this dissertation, I will focus on team adaptation to interruptions. Since discrepancies, or interruptions, as defined by Rudolph and Repenning (2002), are the main type of

interruptions requiring adaptation (due to changes in plans), I focus on this type of interruption at the team level. I consider external events that halt the team's work and require teams to revise the original plan in order to perform their task. Examples of this type of interruption at the group level include all of the structural changes that Gersick and Hackman (1990) refer to as impetus for change of the routine behaviour in groups, namely: change in the composition of the group, change in the design of the task, and alteration of the group's authority. Membership change, change in the material with which a group works, extending or shortening the group deadline, and changing the group's goal will all force the group to stop and revise its plan.

**Group Interruptions**

Earlier studies on routine behaviours in groups, though not using the label "interruption", addressed the concept and consequences of interruptions in the group. Gersick (Gersick, 1988; Gersick & Hackman, 1990) suggested that very early in group life, groups establish routines that persist unless something specific happens and breaks a group out of its habits. These specific events, labelled by Gersick as "impetus for change", may result in the group modifying, abandoning, or replacing one or more of its habitual routines. Examples include encountering novelty, experiencing failure, reaching a milestone, receiving an intervention, and coping with structural change (Gersick & Hackman, 1990). The timing of the possible change and the tenacity of the routine are also two additional factors that, along with impetus for change, affect the possibility of the group changing its routines. Furthermore, Louis and Sutton (1991) argue that under the condition of "business as usual",

groups develop cognitive structures to guide automatic thinking. Automatic thinking is a "ready-to-hand" (Heidegger, 1962) mode in which "we have no need for focal awareness of ourselves and our tools" (Packer, 1985, p.1083). However, with a change of situation, automatic thinking becomes insufficient and groups must switch to active thinking, in which group members engage in more conscious cognitive activity to address the change. In examining the conditions that trigger the shift from automatic thinking to active thinking, Louis and Sutton (1991) discuss three "thought-provoking" conditions: novelty, discrepancy, and deliberate requests for active thinking. Technological change, industrial accidents, and reflections on the group's past performance are some of the examples provided by Louis and Sutton (1991) for each condition, respectively. These categories are not mutually exclusive and a situation faced by a group may fit into more than one category. Cognitive errors often happen because actors (i.e. individuals, groups, or organizations) fail to recognize the situation in which they should switch cognitive gears from automatic to active thinking. The studies mentioned by Louis and Sutton (1991) address events that stop the work continuity of the group and require the group to move out of its habitual routines and adapt to new situations. These characteristics fit very well into the definition of interruptions.

In more recent studies, researchers explicitly identify interruptions. The main question in this body of literature is how interruptions affect the group processes and/or the group performance accordingly. Okhuysen and Eisenhardt (2002) suggest that sometimes interruptions may act as a second agenda for the group. While the primary agenda of the group is to complete the main task, the second agenda occasionally shifts group members' attention from their primary activity and redirects the work of the group. This process may

provide the group with a flexibility that leads to higher performance. This research is in line with the "semi-structure" viewpoint (Brown & Eisenhardt, 1997; Eisenhardt & Sull, 2001) in that the interruption imposes a small amount of structure that is "sufficiently rigid so that change can be organized to happen, but not so rigid that it cannot occur" (Brown & Eisenhardt, 1997, p. 29). For example, Gersick (1988, 1989) found that deadlines not only kept the group engaged in their primary task of designing a commercial, but also enacted a second agenda of completing the task in a particular timeframe. Thus, group members occasionally interrupt their task at the midpoint and engage in time-related discussions such as their progress relative to time and the time remaining. These discussions push the group to take advantage of this window of opportunity to evaluate and hence adjust their processes. Another example of using the second agenda is provided by Okhuysen's (2001) research on self-interruptions (interruptions caused by team members, rather than external interruptions occurring outside of the team's control). In familiar groups, team members initiate self-interruptions by switching their attention to social concerns. In groups using formal interventions, the self-interruption is initiated via discussion instructions. Results suggest that either of the interruptions provide windows of opportunity that help groups to understand the task better, consider multiple areas of the group processes, and execute changes in their interactions. This flexible structure creates an opportunity for adaptation and eventually leads to higher performance. Furthermore, Okhuysen and Eisenhardt (2002) found that formal interventions also act as a second agenda that shift group members' attention from their primary activity to the directives of the formal intervention and thus lead to greater knowledge integration in the group. Groups with high knowledge integration engage in

adaptive improvements to their process and task execution and thus enhance their performance. In line with previous research, Zellmer-Bruhn (2003) also suggested that team interruptions spur knowledge transfer and acquisition of new routines. In her field study, by combing through a list of possible interruptions existent in the literature as well as interviewing experts, Zellmer-Bruhn identified and used a list of interruptions. Examples of interruptions include: changes in group membership, changes in technologies used by the group, and organizational restructuring.

Focusing on external interruptions, Rudolph and Repenning (2002), in one of the first studies on the quantity of interruptions, developed a system dynamic model to investigate how the accumulation of small, non-novel interruptions results in organizational collapse. The central construct in their dynamic multilevel model is an interruption. Interruption is linked to the performance using the Yerkes-Dodson law which posits an inverted U-shaped relationship between stress and performance on moderate-to-difficult tasks (Mandler, 1984). Interruption resolution rate (i.e., performance) feeds from two loops: the regulative loop which represents the positive effect of stress, and the reinforcing loop which depicts the negative effects of stress. Based on the level of interruptions that the entity deals with, at any point in time, one of these loops is activated and results in one of the two possible opposite performance consequences for the system: performance improvement, or decline.

In summary, previous research on group interruption suggests that interruptions, if recognized by the group, provoke a switch from automatic to active thinking in groups. As a result of this cognitive switch, groups often reconsider and change their approach and

strategies. These changes often result in a higher level of knowledge transfer and an enhancement of group performance. However, if the number of interruptions increases to the point that cannot be handled by the group, then the group fails to address them and hence would face failure. Overall, while currently more researchers are paying attention to the research on group interruptions, there are still many areas left to be explored. One avenue for future research is to examine the effect of various interruption dimensions on group adaptation and performance. The timing of the interruption occurrence is one of these dimensions that this study will examine. To this end, this study will contribute to the group literature by addressing how interruption timing affects group adaptation.

**Team Adaptation**

In contrast to the less-developed literature concerning interruptions at the group level, existing literature concerning team-level adaptation is more developed. Adaptation generally refers to the manner or extent to which a theoretical unit (i.e., individual, team, or organization) achieves correspondence between the unit's behaviour and a set of novel demands imposed on the unit (Chan, 2000). In recent years, group scholars have focused on various aspects of adaptation at the team level and have hence developed several models of team adaptation. Most recently, Burke and colleagues define team adaptation as "a change in team performance, in response to a salient cue or cue stream that leads to a functional outcome for the entire team" (Burke, Stagl, Salas, Pierce, & Kendall, 2006, p. 1190). Based on their advanced model of team adaptation, they suggest that teams adapt in a recursive, cyclical nature over time to their changing contexts. LePine (2003, 2005), focusing on role

structure adaptation as a team level behaviour, rather than outcome, defines role structure adaptation as "reactive and non-scripted adjustments to a team's system of member roles that contribute to team effectiveness" (LePine, 2003, p. 28). In his first study at the team level, LePine (2003) suggests that team composition with respect to members' cognitive abilities and personalities (i.e. members' achievements and their openness to experience) positively affects the team adaptation and consequently team performance. In his second study, LePine (2005) found that adaptation was also influenced by the interaction of the team's goal difficulty and team composition in terms of team members' levels of goal orientation (i.e., performance orientation as opposed to learning orientation), such that teams with difficult goals and highly learning-orientated members were especially likely to adapt. Marks, Zaccaro, and Mathieu (2000) refer to team adaptation as occurring when "teams are able to derive and use new strategies and techniques for confronting novel elements in their environments" (p. 972). Marks and colleagues also suggest that the similarity and accuracy of teams' mental models and team communication enhance team adaptation. Most recently, Woolley (2009a, 2009b), using lab experiments and field studies, showed that outcome-focused teams exhibit a greater ability to adapt their work processes in dynamic environments compared to process-focused teams. She also suggested that the association between the team's focus and team performance is mediated by team members' level of action identification.

While all above-mentioned studies mainly focus on the individual or team characteristics that affect team adaptation, Waller (1999) examined the pivotal behaviours in a group's adaptation to non-routine events, namely information collection, task prioritization,

and task distribution. Her study observed airline crews, in a realistic flight simulator, working after a hydraulic failure had caused an unexpected change in the flight plan. She found that, in the case of non-routine events, teams that engaged in information collection, task prioritization, and task distribution soon after non-routine events had occurred, had higher levels of performance. Examining the longitudinal data in this study was of great importance and revealed that it was the timing of the behaviours, not necessarily the frequency of the behaviours themselves, that was critical. In line with previous research, Waller Gupta, and Giambatista (2004) also found that higher-performing and lower-performing teams differ significantly in information collection and shared mental-model development in non-routine situations.

In summary, the common theme among all the studies in team adaptation is that teams change their specific task behaviour or strategies for planned behaviour in response to or in anticipation of some unexpected, novel, non-routine or complex events. The elements of shared cognition in teams, most often shared mental models, facilitate teams' efforts to make these necessary changes. Moreover, the *timing* of the behaviours required for adaptation is also of great importance.

Research on interruptions (at the team level) and team adaptation are related in the sense that they both address the same phenomenon: groups facing an unexpected, novel event. In fact, there is such an overlap between the two fields of research that it is not always easy to assign a particular study to one of the fields and not the other. Team adaptation generally focuses on team and team members' characteristics as well as team processes that play a role

in addressing these unexpected events while ignoring the discussion about the characteristics of an interruption. By comparison, although studies conducted in the interruption area of research still look at group processes in addressing the interruption, they pay more attention to the characteristics of the interruption. In this study, I will borrow from studies in both fields to address how the timing of interruptions affects team adaptation.

**Task Transition**

Researchers have developed substantial models and theories to explain the group processes and development (e.g. Gersick, 1988, 1989; Wheelan, 1994; Marks, Mathieu, & Zaccaro, 2001). Presenting her punctuated equilibrium model, Gersick (1988, 1989) argued that groups undergo a two-phase developmental pattern and the transition from phase 1 to phase 2 often occurs at the midpoint. A transition point was defined by Gersick as "the moment when group members made fundamental changes in their conceptualization of their own work" (1988: 277). Furthermore, Gersick argued that transitions occur in two ways: "One way consisted of summarizing previous work, declaring it complete, and picking up a next subtask. A second way was observed in groups whose phase 1 agendas appeared to be floundering. These groups just dropped stalled phase 1 approaches and reached out for a fresh source of inspiration, something around which to crystallize further efforts" (1989: 303). Following Gersick, Waller and colleagues (2002) looked at group pacing behaviour under dynamic deadlines. They also found that task transition occurs when group members finish off idea generation and choice activity and move to idea implementation activity or provide a focus point for their next step.

Moreover, Chang and colleagues (Chang, Bordia, & Duck, 2003) designed an empirical study to reconcile the punctuated equilibrium model (Gersick, 1988, 1989) and the integrative model (Wheelan, 1994) of group development. In the integrative model, groups are viewed as progressing through five developmental stages each described by a unique pattern of behaviours, namely: dependency and inclusion, counter dependency and fight, trust and structure, work, and termination (Wheelan, 1994). Chang and colleagues found that the punctuated equilibrium model and the integrative model complement each other and the difference between them mainly stems from the dimension of observation and the unit of analysis for the type of development. Using the punctuated equilibrium model, they found that groups go through the task transition at which point they were most likely to focus on new content or a new format that would help groups to integrate the material generated up to that point (Chang et al., 2003). Although not all the groups had task transitions exactly at midpoint, most groups (21 out of 25) did undergo the task transition at some point.

In summary, "groups that have some leeway to modify their work processes and must orient themselves to a time limit" (Gersick, 1988, p.36) undergo the task transition in which groups move from planning activities to engaging in acts that contribute more directly to goal accomplishment. In the next section, I review a challenge-hindrance framework developed and mostly discussed in the stress literature. Later, within hypotheses development, I use this framework to address teams' perception of a discrepant interruption and the effect of this perception on team performance.

**Challenge-Hindrance Framework**

To explain the relationship between the stress and performance at the individual level, the existing literature offers two basic models concerning the *level* of the stress or the *nature* (content, type) of the stress. The model based on the *level* of stress suggests that there is an inverted-U relationship between the level of stress and the individual's performance so that the highest level of performance is gained when there is a medium level of stress (Isenberg, 1981; Janssen, 2001; Yerkes & Dodson, 1908). Although this model explains a number of cases, it failed to explain other cases in which, for example, an extreme level of stress resulted in high performance (e.g. Amabile, Hadley, & Kramer, 2002; Eisenhardt, 1989; Gittell, 2003). Scholars also examined how the nature of the stress affects the performance. Selye (1976) was the first to distinguish between "eustress" (good stress) and "distress" (bad stress). Building on this distinction, Folkman and Lazarus(1984) posited that individuals appraise stressful situations as either potentially threatening or potentially promoting mastery, personal growth, or future gains. The cognitive appraisal is defined as "a process through which the person evaluates whether a particular encounter with the environment is relevant to his or her well-being, and if so, in what ways" (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986, p.992). More recently, in a study of top managers, Cavanaugh, Boswell, Roehling, and Boudreau (2000) also found two levels of stressors: "challenge stressors" that are viewed by managers as obstacles to be overcome in order to learn and achieve and "hindrance stressors" that are viewed by managers as unnecessarily thwarting personal growth and goal attainment. Challenge stressors included demands such as high workload, time pressure, job scope, and high responsibility, whereas hindrance stressors included demands such as organizational politics, red tape, role ambiguity, and concerns about job

security. Focusing on the lower-level employees, Boswell, Olson-Buchanan, and LePine (2004) also found that people distinguish challenge stressors from hindrance stressors, and that the two types of stressors have differing relationships with important occupational criteria. However, this research did not examine the relationships between the type of stressor and performance.

In summary, people appraise stressful situations as either potentially threatening or potentially challenging (i.e., promoting mastery, personal growth, or future gains). The outcome of this initial appraisal process influences emotions, which in turn influence how a person copes with stressors. Challenge stressors trigger positive emotions and an active or problem-solving style of coping (e.g., increasing effort) whereas threatening or hindering stressors trigger negative emotions and a passive or emotional style of coping (e.g., withdrawing from the situation) (LePine, Podsakoff, & LePine, 2005).

Examining the influence of stressors on work motivation, LePine and colleagues (2005) suggested that different stressor types influence performance through two different mechanisms. First, in terms of expectancy theory (Vroom, 1964), in the presence of challenge stressors, people are likely to believe that there is a positive relationship between effort expended on coping with these demands and the likelihood of meeting the demands, and are also likely to believe that if these demands are met, valued outcomes will be obtained. Therefore, challenge stressors are often associated with high motivation (LePine et al., 2005). However, in the presence of hindrance stressors, people are likely to believe that no reasonable level of effort will be adequate to cope with these demands and are likely to have

low motivation to increase coping effort. Thus, hindrance stressors are associated with low motivation (LePine et al., 2005). As the motivation is a proximal antecedent of performance, challenge and hindrance stressors are differently related to performance through motivation.

The second underlying mechanism explaining the relationship between type of stressors and performance is based on the concept of strains. Emotional and cognitive effort associated with the appraisal and coping processes (Cooper, Dewe & O'Driscoll, 2001; Folkman & Lazarus, 1984) results in strains such as fatigue and exhaustion, reducing energy that could be used to perform tasks (Cohen, 1980), which in turn harms performance. Hence, both challenge and hindrance stressors have negative, indirect relationships with performance through strains (LePine et al., 2005). LePine and colleagues (2005) found in their meta-analysis that the positive indirect effect of challenge stressors on motivation is much stronger than the negative indirect effect of challenge stressors on motivation through strains, suggesting an overall positive relationship between challenge stressors and performance.

The most recent study regarding the challenge-hindrance framework is one of the only studies focused on the team level, and investigated how time pressure affects team performance differently based on the team appraisal of the time pressure (Chong, Van Eerde, Chai, & Rutte 2011). To this end, data was collected in two parts through an online survey from 81 new product-development teams in Western Europe to measure teams' appraisal of time pressure, level of team coordination and team performance. This study showed that challenge time pressure positively (and hindrance time pressure negatively) affects team coordination and team performance.

In summary, individuals appraise stressors either as a challenge or a hindrance. This appraisal further affects their behaviour so that challenge stressors, through motivation, enhance performance and hindrance stressors harm performance. The challenge-hindrance framework does have support at the team level as well and thus it is valid to assume that stressors are appraised as challenge or hindrance by teams, and this appraisal accordingly affects the team processes and performance. The current study builds on this literature by using the challenge-hindrance framework at team level in addressing how teams cope with discrepant interruptions before and after their task transition.

# CHAPTER THREE: HYPOTHESES DEVELOPMENT

Time and timing are important factors in group development and processes (Ancona & Chong, 1996; Gersick, 1988; 1989; Hackman & Wageman, 2005; Kozlowski, Gully, Nason, & Smith, 1999; Marks e al., 2001; McGrath, 1991; Okhuysen & Waller, 2002; Tyre & Orlikowski, 1994; Wageman, Fisher, & Hackman, 2009; Waller, 1999). Groups, working on a creative task under a deadline, set norms and establish their work processes very early in their life cycles, (Bettenhausen & Murnighan, 1985; Ericksen & Dyer, 2004; Zijlstra, Waller & Phillips, 2012) and they generally follow them up to the temporal midpoint. At the midpoint, research evidence suggests that a group goes through a major transition in its approach toward their task and often changes its behaviour pattern and product design (Gersick, 1988; 1989; Okhuysen & Waller, 2002). As group processes differ through the team life cycle for each project, it is likely that the timing of the interruptions affects the way groups handle these interruptions. To the best of my knowledge, no one has examined how the timing of an interruption's occurrence affects team adaptation. Therefore, in this study I will explore the effect of interruption timing on team adaptation. To this end, in the following sections, I address the effects of interruptions during a team's project life cycle at two stages: pre-transition and post-transition.

## Pre-Transition Interruption

Task transition occurs when group members finish off idea generation and choice activity and move to idea implementation activity or provide a focus point for their next step (Waller et al., 2002). Pre-transition, groups often think about *what* they want to do and

consider different alternatives which result in the transition period. At the task transition, groups primarily think about *how* they want to do the task and generate the plan (Gersick, 1988; 1989). Then, post-transition groups often stick to the plan generated previously and engage in the execution up to the end of their allotted time. Thus, there is a meaningful difference between the group processes and behaviour before and after the task transition. In the early stages of the group life, group members spend most of their time understanding the task, the setting, and available resources, and select their performance strategies. Gersick's work (1988, 1989) suggests that at the midpoint, groups make a major transition in their approach toward their work, and depend on their midpoint agreements to provide a basis for work in the second half of their time. However, Waller and colleagues' (2002) work, while congruent with Gersick's conceptualization of task transition, shows that task transitions in teams do not necessarily happen at the midpoint of the allotted time.

Discrepant interruptions include any change in the group composition, resources or environment that requires changing the initial plan for achieving the group goal. In other words, discrepant interruptions require groups to *revise* their original plan and performance strategies. Therefore, any discrepant interruptions in a group are likely to be perceived by groups as a stressor, and in dealing with stressors there is always emotional and cognitive effort associated with the appraisal and coping processes (Cooper et al., 2001; Folkman & Lazarus, 1984). The stressors may be appraised mainly in two different ways: as a challenge or hindrance (Folkman & Lazarus, 1984) which in turn would affect the emotions and adaptation style (LePine et al., 2005). Earlier studies suggest that individuals' appraisals and reactions to stressors vary somewhat as a function of individual differences (e.g., Folkman &

Lazarus, 1984). However, later studies argued that work contexts have a fairly consistent meaning for the individuals who experience them, and as a result, individuals tend to appraise the particular work stressors in those contexts in a fairly consistent way (Brief & George, 1995, LePine et al., 2005). Investigating this phenomenon at the group level, Chong and colleagues (2011) found that one stressor, time pressure, may be appraised as either a challenge or a hindrance by teams, and this appraisal subsequently affects the team performance.

So how does the group appraise the discrepant interruption that occurs before task transition? When a discrepant interruption happens pre-transition, the group can more easily address that in its planning, since the change is as novel or unexpected as the other details the group is already finalizing in its plans. Moreover, since the group has probably not yet chosen its performance strategies and has not entered the execution stage, it is more likely to perceive the interruption as a challenge rather than a hindrance. Also, using goal- setting theory, we can argue that the change before the task transition would act as a challenging goal which is difficult but still achievable, and thus would act as a motivating force (Durham, Locke, Poon, & McLeod, 2000; Locke & Latham, 1990). Moreover, groups' attention to the time rises around the midpoint time and increases more as time passes (Lim & Murnigham, 1994; Okhuysen, 2001; Waller et al., 2002). Thus, a group may experience less time pressure before the task transition as opposed to after the task transition. Experiencing an interruption when the time pressure is not high can result in appraising the interruption as a challenge and thus engagement in more effort. Therefore, I propose that an interruption that occurs pre-transition is more likely to be perceived as a challenge by the group.

H1a: *Project teams that experience discrepant interruption pre-transition appraise it as a challenge.*

Goal-setting theory also suggests that challenging goals enhance performance through motivating team members to discover, devise, and use strategies that facilitate task accomplishment (Durham et al., 2000; Locke & Latham, 1990; O'Leary- Kelly, Martocchio, & Frink, 1994). An interruption that is appraised as a challenge is associated with difficult yet achievable goals, and accordingly, it encourages teams to employ more efficient strategies to attain main project goals (e.g., Clark & Fujimoto, 1991, Keller, 1986). Moreover, the expectancy theory (Vroom, 1964) states that individual's motivation is an outcome of how much a reward is desirable (Valence), the assessment that the likelihood that the effort will lead to expected performance (Expectancy) and the belief that the performance will lead to reward (Instrumentality). In short, an individual's motivation will increase if they believe that first, their effort will lead to expected performance, second, that the expected performance will result in rewards, and third, that the reward is desirable for them. LePine and colleagues (2005) confirmed that expectancy theory explains how challenge stressors are associated with high motivation because individuals are more likely to believe that there is a positive relationship between effort made in coping with these demands and the likelihood of meeting the demands, and also likely to believe that if these demands are met, valued outcomes will occur. Thus, I conclude that an interruption that is appraised as a challenge results in more motivation in group members and hence enhances the group performance. This leads to the following hypothesis:

H1b: *In the project teams that experience discrepant interruptions pre-transition, challenge stressors are positively associated with team performance.*

**Post-Transition Interruption**

Under certain circumstances, a transition moment is the point in time where groups agree on some concrete plan that will serve as the basis for moving their projects forward (Gersick, 1989). Post-transition is the action moment in which groups engage in executing the plan they have generated or accepted at the transition. At this stage, groups are generally unlikely to alter the basic plan that has already been developed and crystallized at their transition period (Gersick, 1988). Some scholars suggest that, after their task transition, groups settle into a mode of operation and work steadily until a final push at the end of the project, while other scholars suggest that groups increase their work pace as they get closer to the deadline (Waller et al., 2002; Lim & Murnighan, 1994). In both cases, scholars presumably imply that, post-transition, groups stick to their original plan or the revised plan developed at the transition, both of which assume that there are no major changes in available resources or interruptions from the external environment, and focus mainly on executing the plan to meet the deadline.

Post-transition, groups are past the planning stage, are settled in with the plan, rules, and norms of completing the tasks, and are mainly focused on execution. Discrepant interruptions demand some modifications in the plan, which require groups to change focus from execution back to planning in order to revise existing performance strategies. This change of focus often exerts some cognitive burden on groups and slows down the group rhythm of action (Louis &

Sutton, 1991). Therefore, adapting to the new changes in response to an unexpected interruption, and maintaining the performance at the original level may be much more difficult at post-transition, apart from the differences in the perception of time resources remaining or the time pressure. Therefore, any unexpected event that necessitates a change in the group's plan may demotivate the group, leave group members with the sense of not having enough control over their work, and most likely cause the group to perceive the discrepant interruption as a hindrance to its performance. This leads us to the following hypothesis:

H2a: *Project teams that experience discrepant interruptions post-transition perceive it as a hindrance.*

Folkman & Lazarus's (1984) transactional theory of stress suggested that team members adopt avoidance tactics in dealing with problems under threatening situations. In line with this idea, a number of studies have shown that stressful situations harm team performance (LePine, LePine, & Jackson, 2004; LePine et al., 2005; Podsakoff, LePine & LePine, 2007). Moreover, in terms of expectancy theory, hindrance stressors are associated with low motivation because individuals are likely to believe that no reasonable level of effort will be adequate to meet these types of demands. Therefore, individuals tend to have low motivation to spend effort on coping, regardless of any desire to cope based on the subjective value of potential outcomes (LePine et al., 2005). Furthermore, the emotional and cognitive effort associated with the appraisal and coping processes (Cooper et al., 2001; Lazarus & Folkman, 1984) results in strains such as fatigue and exhaustion, which in turn harm performance

because they reduce energy that could otherwise be used to perform tasks (Cohen, 1980).

Therefore, in line with previous findings (e.g. Chong et al., 2011; LePine et al., 2005), I

suggest that hindrance stressors are negatively related to performance, because indirect effects

through both motivation and strains are negative. Taken together, I expect the discrepant

interruption, appraised as a hindrance, to harm group performance.

H2b: *In the project teams that experience discrepant interruptions post-transition,*

*hindrance stressors are negatively associated with team performance.*

**Team Coordination**

Team coordination is defined as "the process by which team resources, activities, and

responses are organized to ensure that tasks are integrated, synchronized, and completed

within established temporal constraints" (Cannon-Bowers, Tannenbaum, Salas, & Volpe,

1995, p. 345). Previous research suggested that in complex and fast-paced work environments

team coordination has a significant effect on team performance (Ellis, 2006; Faraj & Sproull,

2000; Gittell, 2001; Gittell, 2002; Hoegel, Weinkauf, & Gemuenden, 2004). Therefore, I

assume that the inclusion of team coordination as one of the team processes in this study is

particularly insightful for team performance.

Groups often plan their activities according to their available time and use temporal

milestones to guide their work (Gersick, 1994; Okhuysen & Waller, 2002). Therefore,

changes in time resources affect the group pacing behaviour. When the time resource is

contracted, groups may perceive more time pressure and are more likely to increase their

performance activity (Waller et al., 2002). The time resources can shrink in at least two ways: a) directly as a deadline shortens, b) indirectly as the amount of activities needs to be done in the allotted time increases. Both scenarios imply that a group is required to do more activities per time unit and thus experiences more time pressure. Therefore, when a discrepant interruption occurs, a group needs to make some changes in the fixed time, and thus will feel more time pressure regardless of the timing of an interruption.

Time pressure is expected to influence team coordination by considering the effects of narrowing attention on informational and social cues under time pressure. When a team perceives the discrepant interruption as a challenge, the narrowing of focused attention results in understanding the essential information, and paying attention to others (Chong et al, 2011). For example, the case of Apollo 13, in which the Houston-based crew worked effectively under time pressure is a good example of effective team coordination under challenge stressors (Lovell & Kluger, 1994). Under the extreme time pressure, the team needed to modify their solution, and to this end team members worked together and exchanged information in a coordinated way. Another example of positive effects of challenge stressors on team outcome has been discussed by Chong et al. (2011) in new product development teams. Conducting a field study, Chong et al. (2011) revealed that teams engage in more coordination activity when they perceive the time pressure as a challenge rather than a hindrance. Therefore, I hypothesize that:

H1c: *In the project teams that experience discrepant interruptions pre-transition, challenge stressors are positively associated with team coordination activity.*

When the discrepant interruption is perceived as a hindrance, then the range of informational cues considered in a group is progressively reduced (Callaway & Dembo, 1958; Callaway & Thompson, 1953; Chajut & Algom, 2003, Karau & Kelly, 1992; Kelly & Loving, 2004). Attention focus may be potentially beneficial to groups as groups focus on salient cues and don't waste time on interactions (Gladstein & Reilly, 1985). However, studies have found that under hindrance stress, groups are more likely to engage in misjudgement (Speier, Vessey, & Valacich, 2003, Staw, Sandelands, & Dutton, 1981), where critical information is not exchanged and hence not considered by group members (Kelly & Loving, 2004). Moreover, time pressure could result in groups overlooking the social cues such as facial expression, requests for support, feedback, and clarification of timing and priorities (Cohen, 1980; Driskell, Salas, & Johnston, 1999; Ellis, 2006). These cues enhance shared understanding of the project and goals, and consequently, the way team members synchronize workflow processes. Therefore, overlooking the social cues potentially harms team coordination (Chong et al., 2011). Taken together, I expect the hindrance stressor to affect the team coordination activity negatively.

*H2c: In the project teams that experience discrepant interruptions post-transition, hindrance stressors are negatively associated with team coordination activity.*

Based on the previous hypotheses, I expect that the challenge and hindrance stressors positively and negatively affect the team performance and team coordination activity, respectively. Moreover, a great body of research has also suggested that there is a positive association between team coordination and team performance (e.g. Ellis, 2006; Faraj &

Sproull, 2000; Gittell, 2001; Gittell, 2002; Hoegl & Gemuenden, 2001). Therefore, in line with previous findings (Chong et al., 2011), I also suggest that team coordination activity mediates the relationship between the stressor and team performance.

*H1d: In the project teams that experience discrepant interruptions pre-transition, team coordination activity mediates the effect of challenge stressors on team performance.*

*H2d: In the project teams that experience discrepant interruptions post-transition, team coordination activity mediates the effect of hindrance stressors on team performance.*

Figure 1 summarizes the theoretical framework of this study.

# CHAPTER FOUR: METHOD

## Sample and Procedure

To test the model, 171 undergraduate students were recruited to work in 57 teams of three. Participants first filled out an online questionnaire in which their background information was collected and they picked their desired time slots for teamwork. Then, participants were assigned to teams of three and attended the study.

In this study, I used a creative task structurally similar to the one used in Gersick's (1989) laboratory experiment. This experiment has been also used by Waller and colleagues (2002) when introducing a change in a deadline as an interruption. In this experiment, three-person teams were asked to assume the role of writers at an advertising agency faced with the task of creating a 60-second radio commercial for a well-known airline. The 60-second radio commercial was supposed to be humorous, emphasize the airline's friendly culture, be consistent with the airline's mission statement, and meet the budget constraint. All these requirements, except for being humorous were the same as the ones used by both Gersick (1989) and Waller and colleagues (2002). I included the humorous requirement because I needed to add one element that I could change to create a discrepant interruption. Based on the definition of discrepant interruption (discussed in the literature review section), this change should necessitate the team modify its plan or strategies, and having five groups as pilot studies suggested that changing from humorous to non-humorous is an appropriate discrepant interruption for teams. In the pilot studies, I examined two types of change first, the change from non-humorous to humorous and the change in the budget. However, I found

that neither of them was significant for groups. It seems that at least for my sample it felt

natural to come up with humorous ideas. Therefore, I decided on the change of making the

commercial non-humorous rather than humorous. All participants received two movie passes

for their participation; however, the team with the best commercial, judged by external

judges, also received a bonus of $50 per member. I told participants that several groups would

be doing commercials and in order to keep their chance of winning high, they should not talk

about the experiment with participants from other teams. The bonus was intended to help

motivate the students to do the task and pay attention to the requirements and evaluation

criteria and also discourage them from discussing the experiment details with other potential

participants.

I provided each team with a folder of written instructions including information about

the client airline, a description of the requirements and resources, a list of the costs of a

recording session, and a statement about how much the advertisement could cost. Each group

also received a CD of a couple of music pieces and sound effects. At the end of their allotted

time, a technician entered the room and audio-recorded their advertisement.

The teams had exactly 40 minutes to do the task, and in order to emphasize the time,

each team ran a stop watch on their computer that counted down their time by seconds. All

teams faced the same interruption at 20 minutes into the task. The interruption was a change

in the product requirements. Each team received a letter from the vice president stating that

he had changed his mind, and based on new information, the commercial advertisement

should now not be humorous, despite the initial requirement. Participants were asked to fill

out two questionnaires: one short questionnaire immediately after the interruption occurred, and another once they had finished their task. The entire session was audio-video recorded.

**MeasuresBackground questionnaire.** The background questionnaire included the demographic information of participants including: age, gender, education, work experience, and native language.

**Team performance.** The teams' task was to create a 60-second audio commercial. Therefore, team performance was measured by assessing the quality of audio commercials. To this end, I developed a few questions to measure the quality of audio commercials based on the scale developed and used by Jang (2014). Then, three independent individuals, familiar with the marketing field, used the measure to assess the quality of commercials created by the 57 teams that participated in this study. The average of these ratings was assumed as the team performance. See Appendix A for team performance scale in this study.

**Team coordination**. Team coordination was measured with items developed by Lewis (2003). The five-item scale asked team members the extent to which the teams worked together in a synchronized fashion. An example of the scale is "Our team had very few misunderstandings about what to do." ($\alpha = 0.72$). See Appendix B for the team coordination scale.

**Appraisal of the interruption**. At the midpoint, team members were asked to fill out a short questionnaire addressing their appraisal of the interruption and the time pressure. Team members filled out the questionnaire independently without sharing ideas with each other. A

measure was developed based on Chong and colleagues' (2011) measure of challenge and hindrance. Items were measured on a 5-point scale (1= strongly disagree to 7 = strongly agree). See Appendix C for the scale.

**Task Transition**. Two individuals who had no knowledge of the study's hypotheses coded the task-transition time for all teams by viewing the video recordings. First, I trained the coders regarding the task transition based on the coding guide provided by Gersick (1989). Then, the coding process was done independently and coders and I met regularly (after each group of five teams were coded) to discuss coding discrepancies until we reached consensus. Basically, after the first meeting, we had no more disagreements to be addressed, suggesting that identifying the task transition was clear cut in all subsequent cases.

All teams followed a similar set of steps to develop their commercial storyline. First, they engaged in understanding the task requirements and their available tools and information (i.e. the CD including sound effects and sound tracks and the airline's website). Then, they agreed on their approach and next steps to complete the task. Finally, the teams discussed their ideas for the commercial and selected the best storyline. The task transition was coded as the time at which the team selected their commercial storyline.

# CHAPTER FIVE: ANALYSIS AND RESULTS

## Demographics

I collected data from 171 individuals which formed 57 teams of three. Of the 171 students who participated in this study 52 (30%) were female and 119 (70%) were male and the average age of this group was 20 (SD = 1.62). Due to some technical difficulties, the teamwork of one team was not recorded and thus the task transition could not be coded; this team was eliminated from the rest of the analysis, resulting in a total sample size of 56 teams.

## Task Transition

From 56 teams that were coded for their task transition, 30 (54%) of them had their task transition before the midpoint (i.e. before 20 minutes into the task) while 26 (46%) had their first-task transition after the midpoint. Task transition is discussed in more detail in the exploratory analysis section.

## Aggregation Analysis

I conducted two analyses to determine the degree to which the responses gathered from team members regarding hindrance and team coordination reflected a shared reality within each team. If a shared reality is evident, we expect to find ratings from different individuals in the same team to be similar, and comparatively more similar to one another than ratings from informants from other teams (Bliese, 2000). I conducted the aggregation analysis with the average interrater agreement coefficient ($r_{wg}$) (James, Demaree, & Wolf, 1993) and the interclass correlation coefficient (ICC) (Kenny & Lavoie,1985). The average $r_{wg}$ values were .

77 (SD = .20) for hindrance and .86 (SD = .17) for team coordination, indicating high within-team similarity. The interclass correlation coefficient also calculated for hindrance (ICC = .26, $F = 1.87$, $p = .005$) and coordination (ICC = .30, $F = 2.311$, $p < .001$). The results of $r_{wg}$ and ICC show support for aggregation at the team level.

**Hypotheses Testing**

The main part of the proposed model suggested that teams that had their task transition before the discrepant interruption have lower performances compared to the teams that had their first-task transition after the discrepant interruption. Subsequently, the rest of the model explains the mechanism that results in this difference. Therefore, the first step to test the model was to compare the team performances of these two sets of teams: teams with the first transition before and after the discrepant interruption. The t test suggests that in contrast to my hypothesis, teams that had their first-task transition before the discrepant interruption have higher performances ($M = 7.03$, $SD = 1.7$) compared to the teams that had their first-task transition after the discrepant interruption ($M = 6.01$, $SD = 1.17$), ($t(54) = 2.57$, $p < .05$).

The next step to test the hypotheses, was to develop the correlation table (Table 1). Based on this table, there is no significant correlation between the challenge, hindrance and the task transition (before or after midpoint). Therefore, there is no support for H1a and H2b.

Furthermore, there is also no significant correlation between the challenge, hindrance and team performance. Thus, there is no support for H1b and H2b.

H1c and H1d suggest that challenge and hindrance affect the team coordination in positive and negative ways, respectively. However, there was no significant correlation between challenge and hindrance and thus H1c and H1d are not supported.

H1d and H2d suggest that team coordination mediates the effect of challenge and hindrance on team performance. Since the main association between challenge, hindrance and team performance is not supported, it is not reasonable to do any further investigation regarding these hypotheses, and in fact there is no support for H1d and H2d. Having said that, there is a positive association between team coordination and team performance r(56) = .52, p <.001.

Realizing that none of my hypotheses were supported, I was curious to understand why my theoretical model did not work. The theoretical model may be refuted for two general reasons: first, the theoretical arguments are not correct and second the method used to test the model has some deficiency. Reviewing the videos and looking deeper into my data suggests that there are deficiencies in each part. On the theoretical note, it seems that the teams who make their first transition before the discrepant interruption are much better in addressing the discrepant interruption and accordingly have higher performance (this finding is explained in more detail in exploratory analysis). This finding suggests that, in contrast to my initial hypothesis, although these teams have to switch back from execution mode to planning mode and go through a second transition, they do this efficiently and thus have higher performance. It seems that making one task transition in time provides the groups with the skill and potentially the confidence required to make the second task transition in time and effective.

In addition, while the challenge hindrance framework has been used and supported previously by other scholars (e.g. Chong et al., 2011), none of the hypotheses related to this framework was supported in my study. I believe that the reason for this inconsistency mostly relies on the timing of the measurement for challenge and hindrance. As I mentioned in the method section, the measurement was done at the individual level and immediately after the team members were informed about the discrepant interruption. Reviewing the video clips of the teams, I observe that such a timing may not be the best time to measure team members' appraisal of the discrepant interruption. What is measured immediately after the interruption may be the shock that team members were experiencing as they were not expecting any discrepant interruption. So, most individuals perceived the discrepant interruption as a hindrance to their performance. This is supported by the fact that the average of team hindrance for all team members is high (3.5 out of 5). I believe, to really capture the team appraisal of the discrepant interruption, we should not limit our data collection to a questionnaire but rather code the teams behavior and discussion in the five minute interval after the discrepant interruption. Those discussions should better reveal whether the team perceives the discrepant interruption as a challenge or a hindrance.

**Exploratory Analysis**

Although the hypotheses developed in this dissertation were not supported by analysis results, in performing the analysis, I noticed two interesting findings. First, different teams went through their task transition at different times during their allotted time. Second, contrary to what I had predicted, teams that made their task transition before the discrepant

interruption outperformed teams that made their task transition after the discrepant

interruption. These two findings suggested additional insights could be achieved with deeper

investigation of the data exploring differences in performance among the teams. In the

following sections, I review the results of this exploratory analysis.

**Task transition.** Gersick (1989) studied eight groups in the laboratory and eight groups in the

field, and suggested that the task transition often occurs at the midpoint of a team's allotted

time, catalyzed by a team's attention to time at the midpoint. However, looking at the larger

sample of 25 teams and still using the Gersick's task, Chang and colleagues (2003) found

transitions at the midpoint only in nine (36%) teams. In this study, 56 teams engaged in

essentially the same task used by Gersick (1989) and Chang and colleagues (2003). Based on

Gersick's (1989) conceptualization of the transition, the coders for the current study identified

the task transition as the moment when teams end the planning and information-sharing stage

and pick the story that they want to use for their commercials. However, unlike the previous

studies, all these teams faced the same discrepant interruption at the midpoint which

artificially forced teams to engage in either their only task transition or their or second task

transition. Before the interruption, some teams had already moved through a *first* task

transition, some as early as four minutes into the task; these teams experienced a *second* task

transition after encountering the interruption. Other teams did not experience their *only* task

transition until after the interruption, some as late as 38 minutes into the task.

Some of the teams went through the transition at two separate times. I will address

these second-task transitions later on in this section. But, focusing on the first task transition,

from 56 teams, 30 of them (54%) made their first transition before the interruption while 26 (46%) delayed their task transition until after the interruption. Looking closer at the first task transition, my data suggest that 26 teams (46%) made the transition in the second quarter of their allotted time (i.e., any time between 10 to 20 minutes into the task). The frequency and distribution of these teams' first task transition is depicted in Figure 2.

Teams that went through their first transition before the discrepant interruption needed to go through their second transition to address the interruption change by revising their plan. The second-task transition for these teams happened as early as seconds after the change or as late as 30 minutes into the task with the mean of 24 minutes into the task (i.e., four minutes after the discrepant interruption). Comparing the second transition of the teams with before-interruption transition (faster teams) to the only transition of the teams with after-interruption transition (slower teams), it is interesting to see that faster teams go through their second transition (M = 24.33, SD = 2.34) earlier than the slower teams (M = 26.27, SD = 3.49) make their only transition (t(5) = 2.57, p = .013). In a sense, the faster teams are faster even though they have to go through at least two task transitions. Although they need to go back to the planning stage and revise their plan, faster teams still do it quicker than slower teams which at the time of the discrepant interruption have not finalized their plan yet. The comparison between the time lapse of second-task transition in faster teams and the time lapse of the only task transition of slower teams is shown in Figure 3.

In summary, in contrast to Gersick's (1988, 1989) midpoint transition hypotheses, and congruent with subsequent research (Chang et al., 2003), these results suggest that teams

working on a creative task under a deadline make their task transitions not necessarily at the midpoint, but at any time during their allotted time. Since in this study the discrepant interruptions happened at the midpoint, teams that made their transition before their midpoint needed to go through a second transition. Interestingly, these teams' first-and-second-task transitions both happened earlier than the only task transition of the teams that delayed their task transition until after the interruption. Knowing this, the second step is to explore the team performance and its relationship with the time lapse of task transition.

**Team performance.** Team performance in teams that made their first transition before the interruption (M = 7.03, SD = 1.7) is significantly higher than in teams that delayed their only task transition until after the interruption ((M = 6.01, SD = 1.17), t(54)= 2.57, p < .05). Moreover, there is significant inverted U- shape association between the time lapse of the first task transition and the team performance (Figure 4). The graph suggests that teams harm their performance if they make their transition *either late or too early* and they have the highest performance if they go through their first-task transition sometime in the second quarter of their allotted time. Based on the quadratic model, 16% of variation in the team performance is explained by the time lapse of the first-task transition squared. See Table 2 for the result of the multiple regression.

**Team coordination.** Since the previous analysis had shown that team coordination is also positively associated with team performance, the next step is to test if team coordination adds to our existing model of quadratic association between the time lapse of first-task transition and team performance. I used the multiple regression analysis to test the effect of team

coordination on the model. Based on the previous section time lapse of first-task transition and its square were already in the model (R-square = .16) so in step three, I entered the team coordination. The R-Square change from model 2 to 3 is .18 and significant (F = 13.93, p < .001). The square of first task-transition time lapse drops to non-significant after considering team coordination. See Table 3 for the result of this multiple regression.

**Time pacing style.** The findings to this point suggest that teams go through their task transition at different times and this has impact on their performance. The next natural step is to explore why teams to go through the transitions at different times. Are there any characteristics that could predict the time lapse of first task transition in teams? Furthermore, are there any characteristics that affect the association between time lapse of task transition and team performance? Reviewing the literature, I find *time pacing style* as the variable most related to this research questions.

Pacing style is a relatively stable personal characteristic and captures how individuals distribute their effort over time in working toward deadlines (Blount & Janicik, 2002). There are mainly three pacing styles in the literature: early action, steady action, and deadline action (Gevers, Rutte, & Van Eerde, 2006; Mohammed & Nadkarni, 2011). Early-action individuals tend to take action as soon as possible in order to finish a task long before the deadline. Steady-action individuals tend to spread out task activities evenly over the time. Finally, deadline-action individuals often start the work close to the deadline and finish just before time runs out. While time urgency involves rigorous attention to when work is due, pacing

style captures how temporal resources are allocated toward task completion (Mohammed & Nadkarni, 2011).

To measure individuals' pacing style in the pre-task questionnaire, I used the measure developed and validated by Gevers and colleagues (2006, 2009). The measure includes five graphs and their descriptions representing five styles of time allocation on a continuous scale. Individuals are asked to choose the graph that best explains the way they pace their work when working on the task under a deadline. The first graph represents an early action-pacing style, the midpoint represents a steady-action style, and the last graph represents a deadline-action style. The second and fourth intermediate graphs demonstrate moderate tendencies toward the early and deadline-action styles, respectively (Gevers et al., 2006). As a result of this continuous order, individuals with lower mean scores are the ones who have an early-action style while the individuals with higher scores possess a deadline-action style. See Appendix D for the pacing-style scale.

First, I was curious to see if team members' time-pacing style was significantly different in teams that have their first-task transition before the interruption versus the teams that delayed their only task transition until after the interruption. Therefore, I performed a t-test and found no significant difference (t = .25, p = .804). My second question pertained to the effect of team members' pacing style on team performance. I did not find any significant association between team members' pacing style and team performance for all teams (r(56) = .18, p = .19). But, then I looked at this association for teams with their first-task transition before the interruption and after the interruption separately. For teams with their first-task

transition before the interruption, again there was not any significant association between pacing style and team performance. But then, interestingly, in teams that delayed their only task transition until after the interruption, there was a positive and significant association between team members' pacing style and team performance, suggesting that for teams exhibiting their only task transition after a discrepant interruption, those teams with more of a deadline-action style perform better than teams with a more early-action style. This results are presented in figure 4.

In summary, my findings suggest that teams working on a creative task under deadline go through their task transitions at different times within their allotted time. Teams that have their first task transition before a discrepant interruption have higher performance than others. Moreover, in this setting, teams will have lower performance if they make their transition too early or too late. Observing team coordination, I find that team coordination positively affects team performance given the context I created. Finally, exploring team members' pacing style, I find that, for teams delaying their task transition until after a discrepant interruption, having a deadline action style increases team performance. In the following sections, I discuss these findings and their implications, explain the limitations of my study, and suggest avenues for future research.

# CHAPTER SIX: DISCUSSION AND CONCLUSION

## Summary of Results

Discrepant interruptions are inevitable in today's highly dynamic environment. However, research on interruptions at the group level is limited. In this dissertation, I aimed to look at team adaptation in the presence of a discrepant interruption with regard to the timing of the task transition in teams. More specifically, I was curious to explore team performance comparing two scenarios: when a team's first-task transition occurs before the discrepant interruption versus when a team's first-task transition happens after the discrepant interruptions. Building on the literature, I hypothesized that teams that have not gone through their first-task transition and are still engaged in planning and information sharing at the time of the discrepant interruptions would have higher performance as compared to the teams that, at the time of discrepant interruption, had already gone through their task transition and made a plan for their task. Then, using the challenge-hindrance framework, I argued that the former teams would perceive the discrepant interruption as a challenge and therefore put more effort into the task, whereas the latter teams perceive the discrepant interruption as a hindrance that consequently harms their performance. Finally, I hypothesized that team coordination would be the team process that mediates the discussed effects on team performance.

The design of the experiment to test these hypotheses was challenging because the task transitions happen naturally in a team and, as a researcher, I had no control over when the teams would go through the task transition. However, based on Gersick's (1988, 1989) theory of punctuated equilibrium, I assumed that a team's task transition happens mostly at the

midpoint. Therefore, I decided to have the discrepant interruptions exactly at the midpoint in the strong hope that teams go through their transitions a couple of seconds/minutes before or after the midpoint, thereby providing the two desired sets of groups appropriate for testing my hypotheses.

Looking at 56 teams, although all teams' first-task transitions were not clustered around the midpoint as much as I assumed, I still found an almost equal split of two subsets enabling me to test my hypotheses. Having said that, almost none of my initial hypotheses were supported (except for the association between team coordination and team performance). Interestingly, opposite to my prediction, the performance of teams with their task transition before the discrepant interruption was higher than that of teams with their task transition after the discrepant interruption. These teams, with their first-task transition before the interruption also went through a second task transition after the interruption. Surprisingly, these teams made both their first- and second- transitions earlier than the teams with only a single task transition, made after the interruption. Moreover, the former teams were all higher in team coordination than the later teams. Therefore, this study suggests that teams that experience a task transition before a discrepant interruption are qualitatively different from the teams that experience a task transition after a discrepant interruption; they make their transition earlier, coordinate better and have higher performance, accordingly.

In the next step, rather than looking at teams in two categories of task transition before and after the discrepant interruption, I looked at all the teams together to see how the time lapse of the first-task transition affects the overall team performance. The best model

capturing the association between the time lapse of the first-task transition and team performance is an inverted U-shape. Team performance would be lower for teams that make their first-task transition either late or too early and would be at its peak for teams that make their first-task transition in the second quarter of their allotted time, before the discrepant interruption.

Late-task transition in teams with a deadline means that these teams have spent most of their time getting familiar with the task and deciding how to do it, possibly leaving themselves with insufficient time to complete a high-quality task. It may also be likely that during the discussions these teams have become trapped in discussing many trivial details and so they have lost their focus on the more critical parts of their task. For example, I have observed that in this study, many of these low-performing teams made commercials that did not even meet the most basic objective requirement of the task, namely, the time duration of the audio commercial (60 seconds). Certainly, I understand that what these low-performers did differently from the high-performers needs more exploration and observation, which I will address further in the research section.

On the other hand, making the first-task transition too early (e.g. four minutes into the task in this study) implies that the team has not spent enough time understanding the task, sharing the information, or thinking about different ways of doing the task. The team has rushed through the planning stage and thus harmed its performance.

Another of my findings related to the difference between the higher-performing teams (i.e., teams with their first-task transition before the discrepant interruption) and lower-

performing teams (i.e., teams with their first-task transition after the discrepant interruption) was that of the team members' pacing style. This finding suggests that for the higher-performing teams, the individual characteristics do not predict the team performance, as if the team processes – like team coordination – override the effect of the individual characteristics. However, for the lower-performing teams, these individual characteristics can contribute to helping the team and reducing the damage to their performance. Team members who are used to doing most of their work nearer to the deadline, in this situation, come to the aid of their teams and thus benefit the team performance much more compared to those teams that have already made their transition after the discrepant interruption but do not possess the deadline-action style.

**Theoretical and Practical Implications**

Theoretical contributions of this study are four-fold. First, this study adds to the literature of timing and team development by exploring the task transition and its effect on team performance. Gersick (1989) argued that teams go through the task transition at their midpoint and she therefore called it midpoint transition. However, in line with Chang and colleagues (2003) my study showed that teams do not necessarily go through task transition at the midpoint; in fact, the first-task transition in teams could occur as early as a couple of minutes into the task or as late as a couple of minutes before the deadline. Note that I also used the same task used by Gersick (1989) and Chang and colleagues (2003) but my sample size (56 teams) was significantly larger than both previous studies (8 and 25 teams).

Second, the study extends the team adaptation literature by considering the effect of the time lapse of the first-task transition on team outcomes. Previous research in adaptation literature mainly involves the team member characteristics and adaptation processes. This study showed that the time lapse of the first-task transition predicts how well a team adapts to the change. Teams perform at a higher level if they neither rush to the task transition nor delay it until after the midpoint.

Third, teamwork literature treats coordination as a key process for team effectiveness (e.g., Cohen & Bailey, 1997; Gladstein, 1984; McGrath & Argote, 2001; Tannenbaum, Beard, & Salas, 1992). Coordination ensures that a team functions as a unified whole (Brannick & Prince, 1997) in which the work of all team members contributes to results (Rico, Sanchez-Manzanares, Gil, & Gibson, 2008). Edmondson (2003) argues that important changes in the team task setting increases the need for real-time communication to coordinate team members' actions. The task and setting used in this dissertation matches Edmonson's argument and confirms her proposition. Specifically, this study implies that team coordination has a strong effect on team adaptation when the team is working on a creative task and is facing discrepant interruptions.

Fourth, while interruptions occur at different levels in organizations, most previous research has focused on different types of interruptions at the individual level. The few studies that address a discrepant interruption at the team level examined the knowledge transfer in teams, the cognitive switch as a result of a change in the team, and the quantity of the interruptions in teams. This study is one of the few to explore an interruption at the team

level. Furthermore, to the best of my knowledge it is also one of the first to address the timing of a discrepant interruption at the team level. Therefore, the findings of this dissertation contribute to the literature by bringing together ideas from team development, timing, and interruptions to shed more light on team adaptation.

This study also has implications for practice. First, the results can shed light on team performance, especially when teams are working under a deadline. Teams could be trained and coached to make their first-task transition at the appropriate time considering a team deadline, not too early and not too late. In addition, managers or team leaders can trigger task transition at the appropriate time by acts such as making milestones at those times, pushing slower teams to make the decision, and forcing rushing teams to engage in more planning before making decisions.

Second, this study suggests that team performance is higher when the task transition occurs before the discrepant interruptions. While team leaders can enhance team performance by encouraging teams to have their task transition at the appropriate time, in some cases, team leaders or manages may also be able to control when the discrepant interruption is introduced to the teams. In these cases, it is better to protect the teams from the external interruptions until team has gone through their first task transition while at the same time encouraging the team to make their transition at the appropriate time. I believe this finding has great implications for practitioners because people, intuitively, may think that it is be better to know about the change before they have planned their task (i.e. task transition) whereas my study

suggests that this is not the case. Teams that have made their transition are more effective in dealing with a discrepant interruption and making their second task transition.

Third, this study also suggests that team coordination strongly predicts team adaptation for teams working on a creative task under deadline. In today's highly dynamic environment, many teams are created to execute creative tasks under deadline and external discrepant interruptions are inevitable. The findings of this dissertation suggest that, in these settings, team coordination is a team process that can greatly affect performance. Therefore, organizations will significantly benefit from enhancing coordination in the teams that work on a creative task under time pressure. Team coordination can be improved through training of team members, intervention of team leaders, or developing protocols and work guidelines that encourage team members to have higher coordination.

**Limitations and Future Research**

A limitation of this study may be its focus on specific types of teams, namely, project-based teams working on creative tasks with deadlines. However, other studies in the domain of time in teams have also used the same type of teams (e.g. Gersick, 1989; Waller et al., 2002; Woolley, 2009a, 2009b) and in fact, the nature of the under-examined phenomenon requires teams to have a deadline.

Second, the discrepant interruption occurred exactly at the midpoint; therefore, it is not easy to argue whether the difference between the team performance is the result of the task transition before and after the midpoint or before and after the discrepant interruptions. I

could not avoid this limitation because my assumption before conducting the experiment was that teams make their task transition very close to their midpoint and to create the situations in which the task transition occurs after and before the change, I decided to make the discrepant interruptions happen at the midpoint. However, my findings suggest that task transitions actually happen at different time lapses for different teams. Therefore, future research should impose discrepant interruptions at different time lapses (e.g. a couple of minutes before the midpoint and a couple of minutes after the midpoint) and see if the results are different from this study.

Third, another limitation or boundary condition in this study occurs around the task characteristics. The task used in this study was a creative, judgemental task with no correct answer. Moreover, the combination of the task complexity and allotted time made this task simple enough to have at most two task transitions. Teams did not have enough time to change their decision a couple of times and thus did not make a number of task transitions. However, teams that work on more complex tasks or maybe have more time to review and modify their decisions will probably make a number of task transitions and follow the cycle of task-transition as suggested by Marks and colleagues (2000). In these more complex situations, the first-task transition may not be as important as it was in this study and thus it has a different effect on team adaptation. However, my study suggests that even teams that went through two task transitions, due to the discrepant interruption after their first transition, still did it effectively and performed at a higher level, compared to the teams that delayed their first transition until after the midpoint. Therefore, it can be argued that the same pattern may hold when going through multiple transitions.

Fourth, another limitation of this study is the severity of the discrepant interruptions. Although the discrepant interruption in this study required the teams to make some changes in their initial plan for the commercial, teams perceived the amount of change needed differently. All 36 teams that finalized their commercial story before the discrepant interruptions went through another task transition and made changes in their story. However, teams perceived the amount of change needed differently and accordingly the level of their modifications also varied from low to high. For example, two teams thought that in order to make their humorous commercial serious they could keep the same story and only change the tone of their voices when playing it. In contrast, a few teams totally discarded their previous storyline and came up with a new storyline for their serious commercial. Hence, I suggest that future research should address two issues: 1) the teams' perception of the discrepant interruption severity because my observations suggest that teams perceive the severity of the same interruptions differently, and 2) different discrepant interruptions with objectively different severity. For example, changing the deadline by two minutes may be a small change compared to losing a team leader.

Finally, this study does not use real teams in real organizations and hence overlooks the effect of a context and the teams' previous experience. The team members experience of similar work, the organization's culture, and the history between team members are some of the factors that may affect team adaptation. While the experiment setting, due to the amount of control the researcher has, is a great setting when we start to explore the phenomena, the next step certainly is to investigate these findings in a field study.

**Conclusion**

Organizations rely greatly on teams to accomplish their tasks and address the inevitable discrepant interruptions in today's highly dynamic environment. However, research on discrepant interruptions at the team level is limited. In this dissertation, I look at team adaptation in the presence of a discrepant interruption with regard to the timing of the task transition in teams.

Findings of this dissertation suggest that teams working on a creative task under deadline go through their task transitions at different times within their allotted time. Teams that have their first task transition before the discrepant interruption have higher performance than others. Moreover, teams will have lower performance if they make their transition too early or too late. Investigating team coordination, I find that team coordination positively affects team performance. Finally, exploring team members' pacing style, I find that, for teams delaying their task transition until after the discrepant interruption, having a deadline action style increases the team performance.

The findings of this dissertation have theoretical and practical implications. I build on the existing literature in areas such as team processes, timing, interruptions, and team adaptation and contribute by shedding light on the phenomenon of team adaptation with regards to the timing of interruptions. Managers and practitioners can also benefit from my findings in managing, coaching and encouraging the teams to improve team performance in the presence of discrepant interruptions.

Tables

**Table 1.**

**Descriptive Statistics and Correlations among All Team-Level Variables**

| Variable | Mean | s.d. | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 1. Interruptions Before/After the Task Transition | 1.46 | .50 | | | | |
| 2. Time Lapse of First Task Transition | 19.32 | 7.58 | .86** | | | |
| 3. Hindrance | 3.50 | .46 | .15 | .002 | | |
| 4. Team Performance | 3.46 | .63 | -.33* | -.27* | -0.05 | |
| 5. Team Coordination | 3.71 | .42 | -.28* | -0.26 | .20 | .53** |

$n$ = 56 teams

* $p$ < .05

** $p$ < .01

**Table 2.**

**Results of Multiple Regression Analysis for the Relationship between Time Lapse of the First Task Transition and Team Performance**

| Independent Variables | Model 1 | Model 2 |
|---|---|---|
| Time Lapse of the First Task Transition | -.27* | 1.14 |
| Time lapse of the first Task Transition Squared | | -1.44* |
| | | |
| $R^2$ | 0.06* | 0.13* |
| $\triangle R^2$ | | .08* |

**Standardized coefficients are reported; n= 56**
**\* $p < .05$**

**Table 3.**

**Results of Multiple Regression Analysis for the Relationship between Time Lapse of the First Task Transition, Team Coordination and Team Performance**

| Independent Variables | Model 1 | Model 2 | Model 3 |
|---|---|---|---|
| Time Lapse of the First Task Transition | -.27* | 1.14 | 0.83 |
| Time lapse of the first Task Transition Squared | | -1.44* | -1.01 |
| Team Coordination | | | .45** |
| | | | |
| $R^2$ | 0.06* | 0.13* | .30** |
| $\triangle R^2$ | | .08* | .18** |

**Standardized coefficients are reported; n= 56**
**\* p < .05**
**\*\* p < .01**

**Figure 1.**

**Theoretical Framework**

```
                    ┌─────────────┐
                    │  Timing of  │
                    │ Interruption│
                    └──────┬──────┘
                           │
                           ▼
┌──────────┐      ┌──────────────┐      ┌──────────────┐      ┌──────────────┐
│   Team   │─────▶│ Appraisal of │─────▶│     Team     │─────▶│     Team     │
│ Activity │      │ Interruption │      │ Coordination │      │ Performance  │
└──────────┘      └──────────────┘      └──────────────┘      └──────────────┘
```
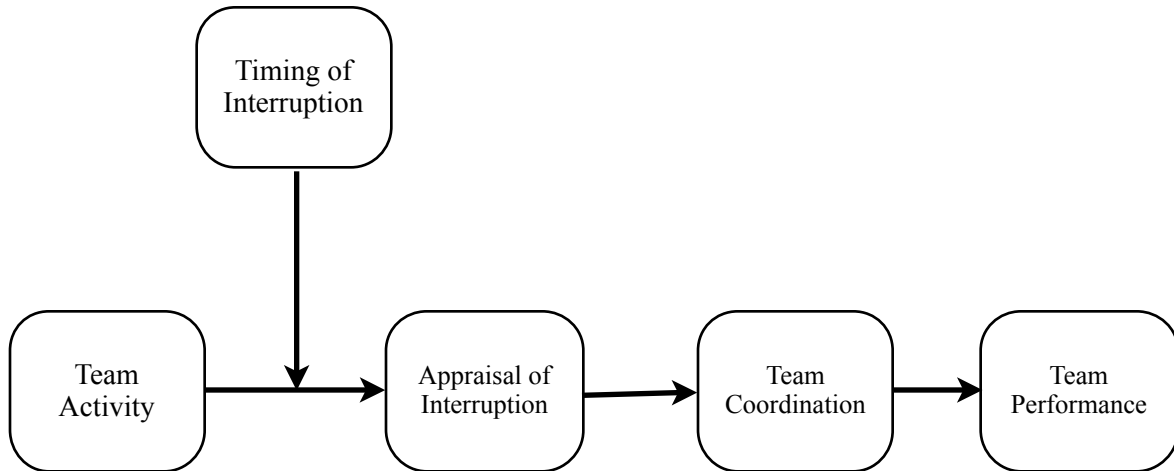
**Figure 2.**

**Timing of the First-Task Transition**
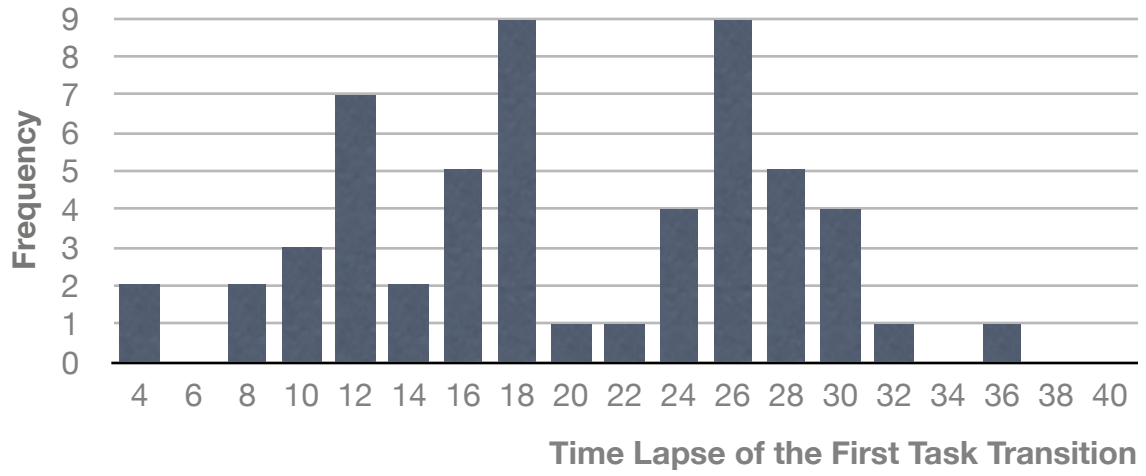
**Figure 3.**

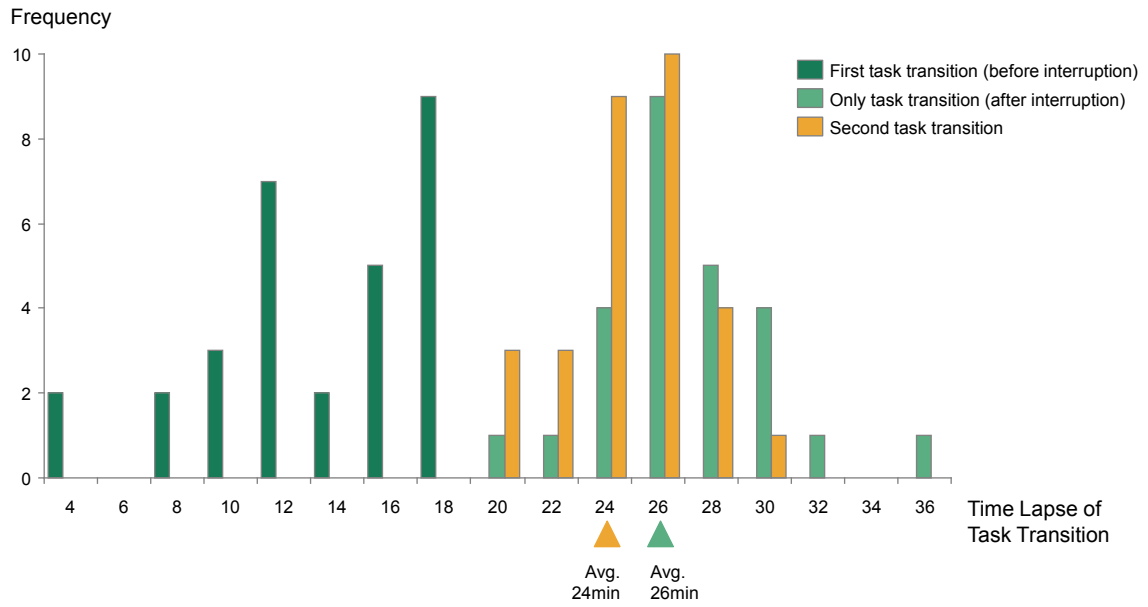**Timing of the First-Task Transition and the Second-Task Transition**



Frequency

Legend:
- First task transition (before interruption)
- Only task transition (after interruption)
- Second task transition

Time Lapse of Task Transition

Avg. 24min    Avg. 26min

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**Figure 4.**

**Team Performance and the Time Lapse of the First-Task Transition**
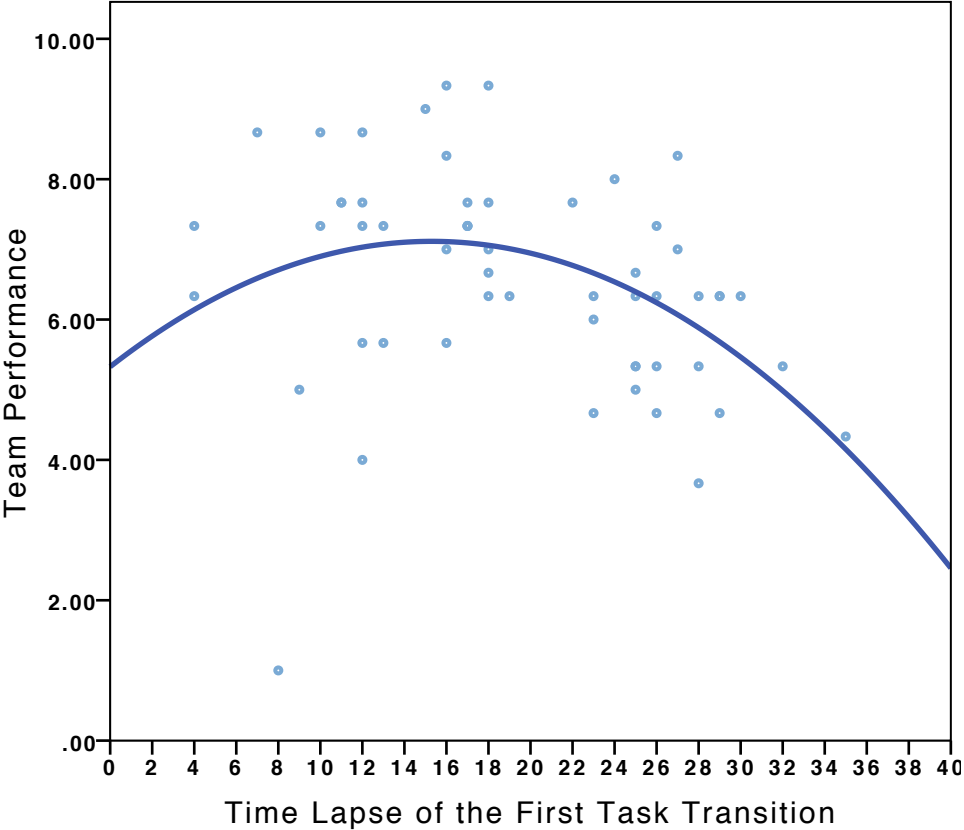
**Figure 5.**

**Team Performance and Pacing Style - The Interaction Effect of Task Transition**
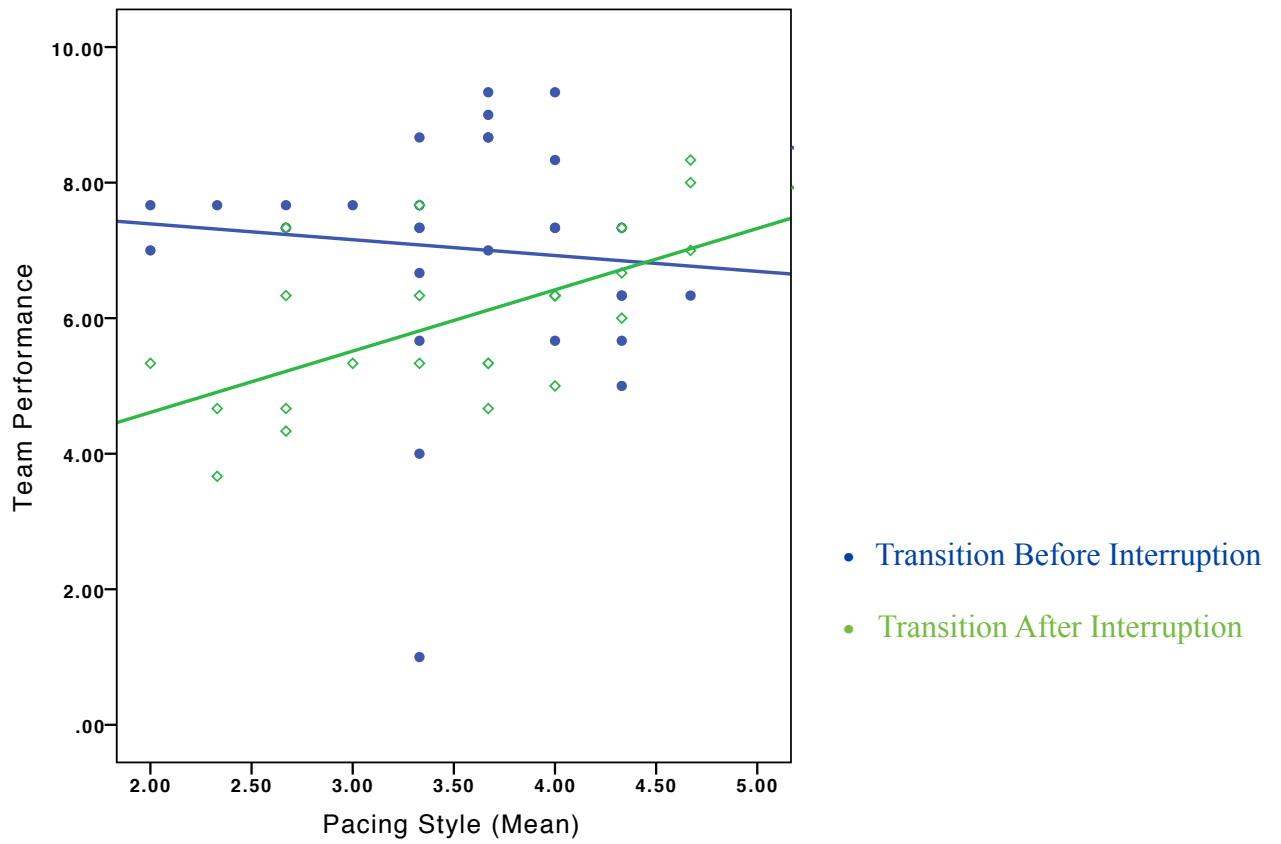
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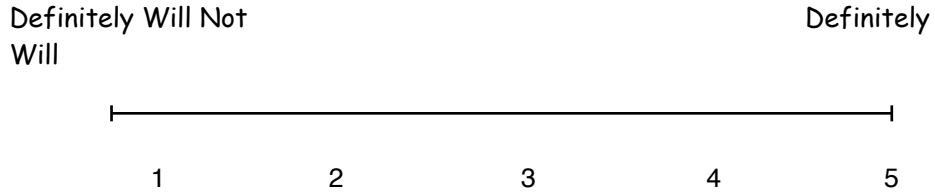    enablers of organizational change. *Organization Science, 13(5)*, 583-597.

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Appendices

## Appendix A - Team Performance Scale

1)  Imagine you are flying from Toronto to New York.
Based on the commercial you heard, would you consider flying with Porter Airlines?
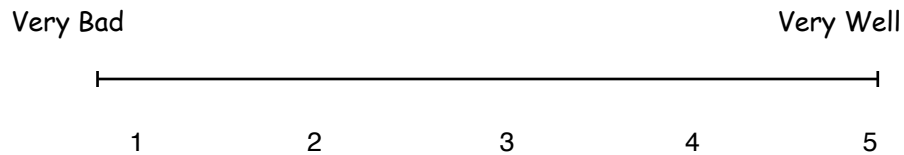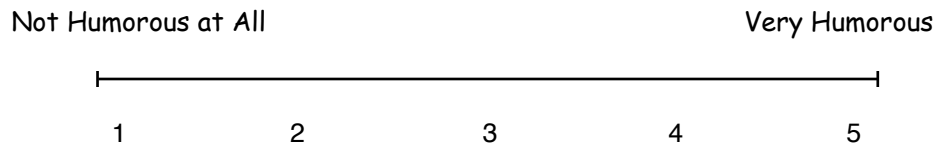
Definitely Will Not                                                Definitely
Will

|   |   |   |   |   |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

2) How **CREATIVE** was this commercial?

Not Creative at All                                                Very Creative

|   |   |   |   |   |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

3) How **INFORMATIVE** was this commercial?

Not Informative at All                                        Very
Informative

|   |   |   |   |   |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
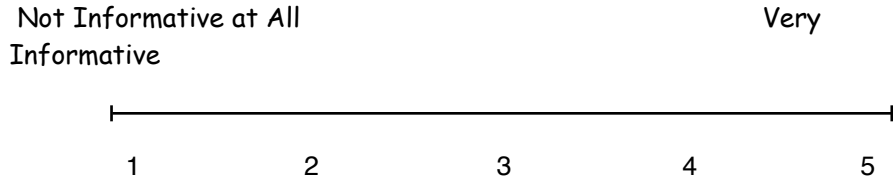
4) How was the **DELIVERY QUALITY** of this commercial?

Very Bad                                                        Very Well

|   |   |   |   |   |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

5) How **HUMOROUS** was this commercial?

Not Humorous at All                                            Very Humorous

|   |   |   |   |   |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

Overall, on a scale of 1 to 10, how would you rate this commercial?

**Overall rating:**

☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆
1 2 3 4 5 6 7 8 9 10

8) Do you have any comments about this commercial? If so please write it down below.

**Appendix B**

**Team Coordination Scale**

1. Our team worked together in a well-coordinated fashion.
2. Our team had very few misunderstandings about what to do.
3. Our team needed to backtrack and start over a lot. (reversed)
4. We accomplished the task smoothly and efficiently.
5. There was much confusion about how we would accomplish the task. (reversed)

All items use a 5-point disagree–agree response format, in which 1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

**Appendix C**

**Appraisal of the Interruption**

To what extent you agree with each of the following statements in relation with the change your team needs to address.

- I feel challenged. (Challenge)

- I feel disappointed. (Hindrance)

- I feel motivated. (Challenge)

- I feel frustrated. (Hindrance)

- Our team can address the change easily.(Challenge)

- Our team may lose. (Hindrance)

- Our team may not finish on time. (Hindrance)

- This change will hurt our team performance. (Hindrance)

All items use a 5-point disagree–agree response format, in which 1= strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, and 5 = strongly disagree.

**Appendix D**
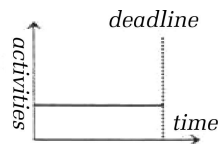
**Pacing Style Scale**

Please circle one of the following models that best represent the way you generally pace your work when performing a task or project.
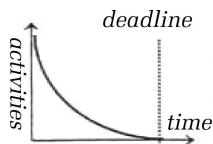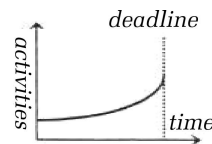


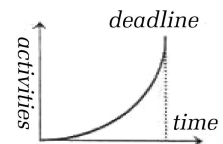(a) I start right away and finish the work long before the deadline
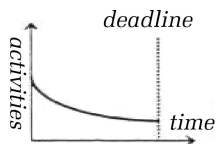
(b) I do quite a bit of work at the start, so I can relax a little towards the end

(c) I work steadily on the task, spreading it out evenly over time

(d) I gradually increase my activities on the task as the deadline approaches

(e) I do most of the work in a relatively short time before the deadline