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How Budget Contraction and Relative Performance Feedback Affect Performance

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How Budget Contraction and Relative Performance Feedback Affect Performance

A Dissertation submitted in partial satisfaction of the requirements for the degree of

Doctor of Philosophy

in

Management

by

Yasar Numan Aksanyar

December 2017

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To my wife Halime Senem, my beautiful daughter Hatice Sena, my baby boy Muhammed Emin, and my beloved father and mother Necati and Fatma Aksanyar for all their love, support and patience.
The definition, understanding, and evaluation of performance have been an interest of the marketing, management, psychology, and education literature for a long time. The goal of this dissertation is contributing to the further understanding of the effects of environmental changes on performance, specifically on how budgetary contractions due to economic tightening and changes in feedback affect performance.

The first chapter investigates to what degree budget contractions resulting from reduced pay-rates affect performance by changing risk preferences, and it aims to investigate whether using social priming can mitigate the relationship between budget contraction and risk-taking behavior. Three experimental studies demonstrated that experiencing a budget contraction through pay-rate reductions leads individuals to involve in riskier behavior in both financial and social domains. Individuals who experience reduced pay-rates took more risk by investing more in a risky lottery game and demonstrated more
dishonest behavior by cheating more. Moreover, the results of the third experiment display that priming individuals with social concepts alleviated the increased risk-taking behavior experienced after budget contraction.

The second chapter investigates the possible negative effects of providing Relative Performance Information (RPI) on the performance of participants working in a group with individual performance-based payment setting. The results of the first experiment demonstrate that when participants lack expertise and need feedback to learn the optimal strategy, providing RPI will hurt average performance. Even though the participants who were ranked at the top and bottom of the ranking scale improved their performance, participants in the middle of the ranking scale performed worse. The second study in this chapter finds that providing RPI on a perceivably easy and unfamiliar task negatively affects the task enjoyment and (absolute and relative) perceived performance at the task by particularly showing that one does relatively poorly compared to their expectation.
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Introduction
Within the realm of subjects such as psychology, management, economics, political sciences and various other social sciences field, the notion of performance and its intricacies that attest various attributes leading up to an enhanced level of performance are intensively studied by the researchers (cf. Campbell, 1990; Greenberg, 2011; Heneman, 1986; Miner, 2007; Schmidt and Hunter, 1992; Wagner and Hollenbeck, 2005). Furtherly, various organizations enforce different programs and techniques of intervention that intends to augment the performance of both, the individual and the concerned organization (Sonnentag, 2002). Individuals can attain satisfaction, pride, and self-confidence by accomplishing their tasks and performing well. Whereas, low performance can generate feelings of dissatisfaction and low self-esteem. Organizations need individuals who perform well to achieve the goals of the organizations and surpass the existing competitors. For this, the organizations oftentimes measure, recognize, and reward the performance of the individuals with financial or any other benefits (Sonnentag and Frese, 2002). Due to its academic and practical significance, the focus of this dissertation will be the understanding how performance is effected by the economic changes.

In the global world, organizations continuously undergo through changes (Cooper and Jackson, 1997; Howard, 1995) due to internal and external factors, and these changes affect individual performance (Ilgen and Pulakos, 1999). To better understand the effects of a particular change on performance and to help managers cope with the changing work environment, it becomes increasingly important to investigate and study how constantly
altering environmental factors effect performance. In this dissertation, the researcher will focus on the performance is impacted by changes among the two factors, namely, economic condition and learning. More specifically, the researcher will provide experimental results on the effects of payment rate change due to the economic downturn and changes in feedback type, on the level of performance.

Performance means the magnitude of success of a person, machine, group, organization etc. while attaining the desired goals or completing work or an activity. The welfare of an economy, the value of a business, the winner of a game or competition, the success of a movie, the salary of an employee, and more depend on and are evaluated on the basis of the performance of an organization, a group, or an individual. Businessdictionary.com defines performance as “the accomplishment of a given task measured against preset known standards of accuracy, completeness, cost, and speed.” Therefore, designing a system that ensures superior performance becomes one of the most important role of the managers. To achieve this goal, managers should understand the factors that contribute to performance so that they can improve the achievements of their employees and organization. Due to the crucial role played by the notion of performance, psychologists have been paying exact attention towards the definition, understanding and evaluating of the performance within the realm of the work (Arvey and Murphy, 1998). Three general perspectives are used by researchers to study performance: individual differences, situational, and performance regulation. The individual differences perspective investigates the innate characteristics of an individuals
that can impact their corresponding performance; the situational perspective identifies the factors in the work environment such as feedback, autonomy, task allocation, and reward system which can advance or hinder performance; whereas, the perspective of performance regulation focuses on the understanding of the performance process and its steps such as goal development, information search, strategy, and execution of action (Sonnentag and Frese, 2002). The intent of this dissertation is to develop and expand on the previous literature as well as to review and integrate more recent research on the situational regulation perspective of performance to contribute to the understanding of how environmental changes individuals’ performance in a job.

Sonnentag and Frese (2002) categorizes the situational predictors of individual performance into two categories: motivational approaches and workplace factors. Motivational approaches include specific approaches like expectancy theory (Vroom, 1964), and approaches that rely on reward systems, and perceptions of equity and fairness (Adams, 1963; Greenberg, 1990). In contrast, workplace factors focus on the situational factors in the workplace that enhance or hinder performance. An important example of the workplace factors approach is the job characteristics model of Hackman and Oldham (1976) wherein the job characteristics like skill variety, task identity, and feedback are assumed to influence performance by affecting psychological states (Sonnentag and Frese, 2002).
This dissertation will attempt to investigate one question on the defined categories of the situational perspective on performance. Chapter 1 will follow the literature on motivational approach and work towards understanding how the changes in reward system influence performance by examining the impact of budget contraction on risk-taking behavior. The results essentially examine how the decrease in pay rate during and after an economic recession impact the decision making and behavior of individuals. Chapter 2 will continue the work on workplace factors by studying how changes in feedback type affect the performance. It will investigate whether providing relative performance feedback can negatively affect performance by demotivating participants.
References


Chapter I

How Social Priming Can Alleviate the Negative Effects of Budget Contraction on Risk-Taking and Dishonest Behavior
Introduction

Through unemployment, pay cuts and transition from full-time to part-time employment the Great Recession which was a period characterized by economic decline and experience globally between the late 2000s and early 2010s, reduced the disposable income for many individuals and correspondingly impacted their decision-making power. A Pew survey (Taylor et al., 2010) conducted during the end of the Great Recession found that more than half of the adult US workers (55%) experienced work-related financial constraints due to cancellations or changes made in their employment contract during the recession (Taylor et al., 2010; Carson et al., 2015). This reduced disposable income led to budget contractions; thus, it is important to understand how such budget contractions affected the behavior of the people.

The negative impact of the Great Recession on peoples’ income prompted a surge in research that examines the economic effects of poverty, scarcity, and budget contraction on decision-making and consumption. For example, Kamakura and Du (2012) exhibit that during a recession, the expenditure shares for positional goods/services decrease, while the expenditure shares for non-positional (essential) goods/services increase. Likewise, Carson et al. (2015) identified an asymmetry in consumption patterns after budget contraction and budget expansion. They find that consumers who experience budget contraction select fewer different types of items than those who experience budget expansion to reach the same budget. Shah et al. (2012) highlight that scarcity could lead to the process of over borrowing by shifting the
attention on salient problems. Griskevicius et al. (2013) have discovered that resource scarcity cues enhance the impulsiveness of individuals who belong to the low socio-economic status, allowing them to make more risks and approach the temptations promptly. Similarly, Haushofer et al. (2013) have exhibited that experiencing negative income shocks leads to an increase in temporal discounting. Haushofer and Fehr (2014) have examined the evidence for the hypothesis that poverty may have particular psychological consequences, and have asserted that the evidence suggests that poverty causes short-sighted and risk-averse decision making. Using data from modified dictator games conducted during the Great Recession and preceding economic boom, Fisman et al. (2014) have showcased that experiencing a recession leads to selfishness and further emphasis on efficiency. More recently, Shah (2015) have showcased that scarcity affects individuals’ valuation by bringing trade-offs to the top of one’s mind and make individuals rely less on the external context when the trade-offs frame the value. Even though these studies discuss many economic and behavioral effects of economic hardship, they do not discuss the social effects of the financial contraction caused by external events like the Great Recession. Previous studies (Catalano et al., 1987; Vinokur et al., 1996) on the health effects of economic decline reports an increasing likelihood of experiencing social stressors not intuitively associated with the economy such as marital difficulties (Catalano et al., 2008). It is important to understand the social results of experiencing hardship and how individuals try to cope with these social implications.
In this chapter, the researcher aims to investigate the relationship between changes in the budget due to environmental factors and behavior. The researcher will comprehend the corresponding impact of reduction in disposable income and budget constraints during the Great Recession on the risk-taking behavior of the individuals who experienced such a sudden change in their respective incomes. Two recent studies (Coval and Shumway, 2005; and Liu et al., 2010) have showed that morning losses of professional traders significantly affected their risk-taking in the afternoon. Taking high risk when unnecessary can financially challenge individuals and firms and cause them to borrow more and fall into a circle of debt. Thus, it is important for practitioners and researchers to understand what factors affect individuals' risk attitude.

This chapter will outline the effect of budget contraction not only in the economic context (risk-taking) but also in the social context (i.e., social risk-taking in the context of dishonest behavior). Moreover, the researcher will investigate the possibility of mitigating the negative effects of budget contraction on risk-taking by priming social values. The research is sociology that have investigated the effects of economic distress and unemployment suggests a negative social impact on society (McManus, 2010). A study that uses large, population-based longitudinal samples of U.S. workers from the Wisconsin Longitudinal Study that investigates the ripple effect of unemployment among families in Wisconsin have discovered that people who lost their jobs, even once, were roughly 30% less likely to participate in community-oriented activities including church groups, youth and community groups, charitable organizations, and informal social
gatherings with friends (Brand and Burgard, 2008). This social withdrawal and social problems caused by economic distress are unexpected and lie in contrast to the assumptions made previously by sociologists that posits that hard times band people together (Putnam, 2000). In this chapter, the researcher will investigate the effect of budget contraction on an economic factor; risk-taking. Moreover, the researcher aims to fill the gap on the social effects of budget contraction by studying a social factor, social risk (i.e. dishonest behavior) and the possibility of using social priming to manipulate the relationship between budget contraction and risk-taking.

In Section II, the researcher discusses the related literature and present the research predictions. Next, in section III, the researcher contends the experimental design and presents the results. Finally, in section IV, the researcher analyses the results and devise the conclusions.

Related Literature

The literature that focuses on the experience of economic hardship investigates how poverty and scarcity affect consumer judgment and decision making. Poverty has been shown to impede cognitive function (Mani et al., 2013) and to lead to short-sighted and risk-averse decisions by causing stress and negative affective states (Haushofer and Fehr, 2014). Moreover, scarcity elicits over-borrowing (Shah et al., 2012), leads to more consistent valuation and reduces certain context effects due to greater trade-off thinking.
Apart from these effects, various studies have shown that individuals who grew up in lower socio-economic status environments are more impulsive, take more risks, and approach temptations more promptly (Griskevicius et al., 2013; Mittal and Griskevicius, 2014). However, these studies tested solely the between-subject differences and these studies fail to discover the variations in the behavior of the individual when they experience a change in their income. This question was tackled by studies in the income change literature.

Specifically, previous work on income change has focused on changes in budget allocation and consumption patterns due to increases and/or decreases in income. The influence of income change on aggregate consumption patterns has been well established in the literature (Hall, 1979; Hall and Mishkin, 1982); also, the reaction of the consumers to increasing and decreasing income is shown to be reflected asymmetrically, i.e. the amount of consumption change made in reaction to an increase in income is not identical to the reaction given to an equally sized decrease (Carson et al., 2015). Bowman, Minehart and Rabin (1993) have showcased that when consumers receive knowledge about changes in the income in the coming future, their consumption changes asymmetrically. The study shows that when the expectation of income increase is known, consumers are more likely to increase their total consumption, rather than alter it when the expectation of income decreases. Moreover, Shea’s (1995 a, b) analysis of quarterly consumptions in the U.S. exhibit that decreases in income lead to more decrease in consumption than the increase in consumption after equally sized income increases. A
similar study on car ownership has found an analogous asymmetric income effect (Dargay, 2001). Consumers were more likely to expand their car spending when their income is increasing than to cut their car spending when their income was declining. In a more recent study, Kamakura and Du (2012) have analyzed household budget allocations and expenditure patterns of positional and non-positional goods and services during the Great Recession. They have discovered that for any given total consumption budget, expenditure shares for positional goods/services, goods/services that reflect a relative position in society, will decrease during a recession, while expenditure shares for non-positional (essential) goods/services will increase. In contrast with prior research on income changes, which has focused mainly on the effects of income change on aggregate spending, Carlson et al. (2015) have examined the effects of budget changes on allocations for individual consumers. Carlson et al. (2015) have demonstrated that when consumers experience a budget contraction they tend to select less variety of items than the consumers who experience a budget expansion and reach the same income level. The effect originates only when the budget is decreasing, and the authors have explained this asymmetry in the budget allocation after an income change by the desire of avoiding the anticipated psychological losses with budget cuts.

The current research differs from previous studies in three important ways. Firstly, unlike most of the literature on poverty and scarcity which analyses the effects of experiencing economic hardship through experiments with between-subject design, the researcher will test the effect of economic contraction in a within-subject experimental
design. Secondly, the researcher will follow the tracks of Carlson et al. (2015) and focus on the effects of budget change on individual consumers in contrast to the majority of the literature, which focuses on aggregate consumption patterns. Finally, the researcher will study the effects of income change in a behavioral context. Apart from Hausehofer et al. (2013), the recent stream of experimental research focusing on income change examines the effects of income contraction or expansion on consumption patterns. Hausehofer et al. (2013) have examined the effect of negative and positive income shocks and have discovered that negative income shocks lead to an increase in time discounting, while positive income shocks lead to a weak decrease in time discounting. Resonating with the study of Hausehofer et al. (2013), the researcher will study the effect of negative and positive income change, but instead of a one-time income shock, the researcher will manipulate the payment rate of the effort task, and investigate how this income change manipulation affects risk-taking behavior.

The literature on reference-dependent utility and the literature on prior outcomes make conflicting predictions about the effect of income change on risk-taking. The hedonic editing rule argues that before people make a choice, they edit all the options to make the final one seem more pleasant (Thaler and Johnson, 1990). While employing hedonic editing, the losses are integrated with prior outcomes while gains are considered independently from these outcomes, which implies risk aversion after losses. The results of Thaler and Johnson’s (1990) experiment supported this argument and have exhibited that prior monetary losses lead to increased risk aversion among the participants. This
finding suggests that budget contractions in the experiment of the researcher must lead to reduced risky choices. Furtherly, it has been shown that people evaluate options against existing reference points (Koszegi and Rabin, 2006, 2007). In the context of the experiment of the current research, the budget constraints due to the pay rate decreases will put participants below the reference point, which is the participants’ own income before the budget contraction, and induce a loss frame, whereas budget expansions will put participants above the reference point and induce a gain frame. According to prospect theory, while making decisions in the loss, domain people are likely to demonstrate risk-seeking behavior, while in the gain domain they are likely to demonstrate risk aversion behavior (Kahneman and Tversky, 1979; Payne et al., 1980; Hershey and Schoemaker, 1980; Hershey et al., 1982; Slovic et al., 1982). Therefore, this literature predicts that budget contractions should make subjects demonstrate risk-taking behavior, whereas budget expansions should lead to risk-averse behavior.

Another category of publications on this subject, the motivation and goal literature make a similar prediction as posited by the literature on prospect theory. The risk sensitivity theory provides a need-based model to explain the relationship between motivations and risk preference. In case of a disparity between an individual’s present state and a goal or desired state this disparity creates a need to close the gap (Zou et al., 2014). According to the risk sensitivity theory, decision makers prefer high-risk options in situations of high need, when low-risk options are unlikely to meet those needs (Mishra and Lalumiere, 2010). In the presence of gains or gain frames, people perceive
themselves to be in lower need because they are close to their desired state or have already achieved it (Mishra and Fiddick, 2012). In contrast, in the presence of losses or loss frames individuals perceive that they are in a situation of high need (i.e., far from a desired state). Thus, according to the risk sensitivity theory, the individuals tend to be risk-averse under gains because their need to meet a desired state is low; furthermore, individuals tend to be risk-taking under loss because their need to meet a desired state is high (Mishra and Fiddick, 2012; Mishra et al., 2010; Rode, Cosmides, Hell, and Tooby, 1999). In the context of the current study, the risk sensitivity theory predicts that budget contractions will create a perception of high need and lead people to risky choices while budget expansions will create a perception of low need and lead participants into less risky choices. In sum, it remains open to what extent income changes affect risk preferences, the researcher will intend to examine the relationship between income changes and risk preferences.

The researcher will test the effect of income change on risk preferences in two studies. In the first study, the researcher will test the effect of budget contraction and expansion on economic risk. To this end, all participants perform a real effort task to earn money where subjects receive different starting payment rates; in addition, they were asked to make an investment choice in a risky lottery. Subsequently, participants experienced a budget contraction or a budget expansion through changes in their payment rates, and continued to perform the effort task and made investment decisions. According to the findings of the researcher, changes in income have an asymmetric effect on risk-
taking. Participants start to take more risk when they experience a budget contraction, and they took less risk when they experienced a budget expansion. The second study investigates the relationship between income change and social risk (i.e. dishonest behavior). Since individuals’ degree of risk-taking was shown to be highly domain-specific, i.e. not consistently risk-averse or consistently risk-seeking across all content domains (Weber et al., 2002), it is important to test whether the effects of income change found for economic risk will generalize to different risk domains. To test this in the context of social risk, participants performed a multiple-question task, wherein they were paid in accordance to their performance; however, the reporting format was manipulated by the researcher to wield the possibility of cheating between control and treatment groups. Participants in the control conditions had no opportunity to be dishonest (i.e. to cheat), whereas participants in the cheating conditions had the provision for such an opportunity. The income change was manipulated in the same way as the first study. The results of the second study demonstrate that the relationship between the direction of income change and the level of dishonest behavior (i.e. cheating) is asymmetric. Participants who experienced a budget contraction cheat more than the participants who experienced a budget expansion.

The present chapter also extends the literature on the effects of income change on risk-taking by testing the limits of such effects. Building on the idea of two markets (Heyman and Ariely, 2004), the researcher show that the effects of income change on risk-taking is mostly applicable to situations where consumers use the monetary market
perspective, and the effects will alleviate or disappear when consumers use the social market perspective. Using Fiske’s relational theory (1992; see also Aggarwal, 2004), Heyman and Ariely (2004) have shown that unlike the common belief that the labor market is only an exchange of effort in return for monetary rewards, there are two types of markets that determine the relationship between effort and payment, namely, money market and social market.

In money market relationships, the level of effort is directly related to the amount of compensation, with the increase in payment the effort will increase as well and vice versa (Clark and Mills, 1993; Fehr and Falk, 2002; Rabin, 1993). However, in the realm of social market relationships, the amount of payment is not a decisive factor of the effort level. The level of effort is a factor of altruism, and individuals exert full effort regardless of payment level (Batson, Sager, Garst, and Kang, 1997; Cialdini, 1997; Trivers, 1971). In the last study of the current chapter, it will be demonstrated that the two market idea carries on to the income change context by alleviating the effect of budget contraction on risk-taking. The activation of social concepts through priming provides a psychological buffer against the negative effects of budget contraction on risk-taking. However, this psychological buffer was not present when neutral concepts were activated.

The next section explains the experimental designs and procedures used in the three studies conducted by the researcher and discuss the corresponding findings.
Study 1:

Participants, Experimental Design, and Procedure

Fifty participants (22 women and 38 men, aged between 20 and 62 years, MD=32), recruited from an online subject pool, participated in the study in exchange for a $1.00 fixed fee plus a performance-based bonus payment. Subjects participated in a real effort task adapted from Vohs et al. (2008) for 16 periods. Each period consisted of 30 simple mathmatic questions wherein the participants were asked to add two two-digit numbers and type the result along with a financial decision at the end of the math task. For each period, the participants had 30 seconds to correctly answer as many questions as they could. After the end of the 30 second period, the participants were asked to complete a decision task that was adapted from Fellner and Sutter (2009). In this task participants were asked whether they would like to keep the earning that they made during the period or invest them in a lottery with equal chance of earning 50% more or losing 25% of their earnings. This variable is referred to as “risky choice”. Two periods were randomly selected at the end of the experiment and the earnings of the selected periods were paid out as bonus earnings.

Each participant was randomly assigned to one of the two treatment conditions, unbeknownst to them: “budget expansion”, “budget contraction”. At the beginning of the experiment, participants in the “budget contraction” group had a high payment rate of $0.10 for each correct answer; alternatively, the “budget expansion” group had a low
payment rate of $0.05 for each correct answer. After 8 periods, both the groups were told that their income rate would change. The timing, magnitude, and direction of the change were unanticipated. After the income rate change, the payment rate of participants in the “budget contraction” group had decreased to a rate of $0.05 for each correct answer; contrastingly, the “budget expansion” group’s payment rate increased to $0.10 for each correct answer for the remaining 8 periods (see Table 1).

Table 1. Payment Rates by Condition and Rounds (Study 1)

<table>
<thead>
<tr>
<th>Condition 1: Budget Contraction</th>
<th>Condition 2: Budget Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Payment Rate ($0.10 per each correct answer)</td>
<td>Low Payment Rate ($0.05 per each correct answer)</td>
</tr>
<tr>
<td>Low Payment Rate ($0.05 per each correct answer)</td>
<td>High Payment Rate ($0.10 per each correct answer)</td>
</tr>
</tbody>
</table>

Results and Discussion

The statistical analysis of variance (ANOVA) using 2 “treatment condition” (budget contraction vs. budget expansion) × 2 “income change” (before vs. after) within-subjects repeated measures with the dependent variable “risky choice” revealed a significant interaction, with F (1, 48) = 4.45, p < .05, η² = .085. Participants in the budget expansion condition took more risk in the first half of the study, before the income rate change, (M = 0.702, 95% CI = [0.550, 0.854]) than in the second half, after the income rate change (M = 0.558, 95% CI = [0.395, 0.721]); whereas participants in the budget
contraction condition took more risk in the second half of the study, after the income rate change ($M = 0.609, 95\% \text{ CI} = [0.440, 0.779]$), than in the first half, before the income rate change, ($M = 0.594, 95\% \text{ CI} = [0.436, 0.752]$). Figure 1 displays “risky choice” by experimental condition.

Figure 1. Risky Choice by Condition (Study 1)

The results demonstrate that people take more risk when the income rate is low (i.e., $0.05$) rather than high (i.e., $0.10$). In the next study, the researcher will test the generalizability of this effect by moving from financial risk to social risk. Specifically, the researcher will investigate whether individuals who experienced a budget contraction will take on more social risk (i.e. cheating) than individuals who experienced a budget expansion.
Study 2:

Based on the rational actor model, individuals carry out dishonest acts consciously and deliberatively by trading off the expected external benefits and costs of the dishonest act (Allingham and Sandmo, 1972; Becker, 1968). In accordance with this argument, when penalties for dishonesty are absent, people should cheat to the maximal degree. However, a growing body of behavioral research have posited that individual cheating is limited even when external penalties are absent (Gino et al., 2009; Jiang, 2013; John et al., 2013; Mazar et al., 2008). Mazar et al. (2008) explains why people limit dishonesty in the experimental context, wherein they can easily earn more money by cheating; they asserted that in order to maintain an honest self-concept, they don’t rely on such dishonest measures (Ariely et al., 2014). This idea suggests that individuals should avoid being involved in socially risky behaviors like cheating and other dishonest behavior to maintain an honest self-concept. The possibility of getting caught in such behavior involves the risk of harming honest self-concept. This strong motive against involving in dishonest behavior provides an opportunity to test the robustness of the negative effects of budget contraction on risk-taking.

Participants, Experimental Design, and Procedure

One hundred and sixty-two participants (74 women and 88 men, aged between 20 and 66 years, MD=33), recruited from an online subject pool, participated in the study in exchange for a fixed fee of $0.50 plus a performance-based bonus that is based either on
actual or self-reported performance. Subjects participated in a real effort task for 8 periods, and each period consisted of 5 questions. The effort task was adapted from John, Lowenstein, and Rick (2013). The researcher have tested the (social) risk by using an experimental cheating paradigm that is similar to that of Mazar, Amir, and Ariely (2008), but instead of trivia questions, the researcher has used “coordination questions” (cf. Mehta, Starmer, and Sugden, 1994).

In this study, participants were asked to guess the answers of other people for a series of questions. The objective of the participants was to give the modal answer from the previous group of people (i.e., the most common answer that was given by previous study participants). The subjects received a point if they were able to correctly guess the most common response of the previous group. For example, the most common answer to the question “Name a type of bird that has long legs” was “ostrich,” and the most common answer to the question “Name a sport that requires a net” was “tennis.” If they did not guess the most common answer correctly, participants received no point.

Participants in both groups (“control” or “cheating”) were randomly assigned to one of two budget conditions, unbeknownst to them: “budget expansion”, “budget contraction”. When the experiment began, participants in the “budget contraction” group had a high payment rate of $0.20 for each correct answer; alternatively, the “budget expansion” group had a low payment rate of $0.04 for each correct answer.
The researcher compared the performance of participants in the control conditions, wherein there was no opportunity to be dishonest, with the performance of the participants in the cheating conditions, in which they had such an opportunity. Specifically, participants in the control group received the coordination questions in multiple choice format and submitted their answers before seeing their score and the associated correct answers to the questions, whereas the cheating group received the same coordination questions with the same answer choices in a self-report format. They saw the same questions and answer choices, but they did not report any answer before seeing the correct answers for each question. After they received the answers, they self-reported the number of correct answers they gave for the coordination questions. This manipulation makes it easy for participants to over-report “correct” guesses (Mazar, Amir, and Ariely, 2008). Table 2 displays the question types and whether cheating was possible or not for experimental conditions.

Table 2. Experimental Conditions (Study 2)

<table>
<thead>
<tr>
<th></th>
<th>Type of Question</th>
<th>Dishonest Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Multiple Choice</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>Cheating</td>
<td>Self-Report</td>
<td>Allowed</td>
</tr>
</tbody>
</table>
In coherence to Study 1, participants in both control conditions and the cheating conditions experienced income rate changes in the middle of the real effort task. The timing, magnitude, and direction of the change were unanticipated. The payment rate of participants for each correct answer in the “budget contraction” group had decreased from $0.20 to a rate of $0.04; alternatively, the “budget expansion” group’s payment rate increased from $0.04 to $0.20 for each correct answer for the remaining 4 periods (see Table 3). Two periods were randomly selected at the end of the experiment and the earnings of the selected rounds were paid out as bonus payments.

Table 3. Payment Rates by Condition and Rounds (Study 2)

<table>
<thead>
<tr>
<th></th>
<th>Round 1-4</th>
<th>Round 5-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget Contraction</td>
<td>High Payment Rate ($0.20 per correct answer)</td>
<td>Low Payment Rate ($0.04 per correct answer)</td>
</tr>
<tr>
<td>Budget Expansion</td>
<td>Low Payment Rate ($0.04 per correct answer)</td>
<td>High Payment Rate ($0.20 per correct answer)</td>
</tr>
</tbody>
</table>

Results and Discussion

The result of a repeated measures ANOVA on the number of correct answers, with the between-subjects factor “treatment” (control, cheating) led to a significant main
effect for “treatment” (F (1, 160) =123.32, p<0.001, $\eta^2=0.44$). In the cheating group, participants answered more questions correctly in comparison to the actual number of correctly answered questions by participants in the reference group (M_{Cht}=2.76 vs. M_{ref}=0.78, p<0.001). This result confirms the success of the cheating manipulation.

The result of a repeated measures ANOVA on the number of correct answers, with the within-subjects factor “half” (rounds 1-4, rounds 5-8), and the between-subjects factors “treatment” (control, cheating) and “budget” (expansion, contraction) yield significant main effects for “treatment” (F(1, 158)=128.45, p<0.001, $\eta^2=0.45$) and “budget” (F(1, 158)=4.20, p<0.05, $\eta^2=0.26$), but no interaction effect was found. When the researcher analyzed the treatment conditions (control, cheating) separately, the between-subjects factor “budget” (expansion, contraction) yield significant main effects for the cheating group (F(1, 100)=4.68, p=0.033, $\eta^2=0.45$), but the main effect for the between-subjects factor “budget” (expansion, contraction) was not significant for the control group (F(1, 58)=3.18, p=0.080, $\eta^2=0.52$). There was a significant difference between the numbers of correct answers reported by the budget groups in the cheating condition (M_{contraction}=3.05 vs. M_{expansion}=2.48, p<0.05), whereas the difference between the numbers of correct answers given by the budget groups in the control condition was not significant (M_{contraction}=0.86 vs. M_{expansion}=0.71).

In cheating condition the number of correct answers given by participants in the budget contraction group was significantly higher than the number of correct answers
given by participants in the budget expansion group. However, this difference was not observed in control group, that is the number of correct answers given by participants in the budget contraction group was not significantly higher than the number of correct answers given by participants in the budget expansion group. Figure 2 displays the number of correct answers given as a function of the experimental condition.

Figure 2. Number of Correct Answers by Condition (Study 2)

The analysis on the number of correct answers given by each condition group (2 “treatment” (control, cheating) x 2 “budget” (expansion, contraction)) before and after the income change yielded a significant difference between the numbers of correct answers reported by the contraction group in the cheating condition ($M_{before}=2.93$ vs. $M_{after}=3.17$, $p<0.01$), whereas the difference between the numbers of correct answers given by all of the other groups was not significant (Expansion, Cheating ($M_{before}=2.40$
vs. \( M_{after} = 2.56, p < 0.08 \), Expansion, Control \((M_{before} = 0.69 \text{ vs. } M_{after} = 0.72, p < 0.36)\),

Contraction, Control \((M_{before} = 0.86 \text{ vs. } M_{after} = 0.85, p < 0.44)\) (see Table 4).

**Table 4. Number of Correct Answers (Study 2)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Budget</th>
<th>Before Income Change</th>
<th>After Income Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Round 1-4</td>
<td>Round 5-8</td>
</tr>
<tr>
<td>Cheating</td>
<td>Contraction</td>
<td>2.93</td>
<td>3.17</td>
</tr>
<tr>
<td>Cheating</td>
<td>Expansion</td>
<td>2.40</td>
<td>2.56</td>
</tr>
<tr>
<td>Control</td>
<td>Contraction</td>
<td>0.69</td>
<td>0.72</td>
</tr>
<tr>
<td>Control</td>
<td>Expansion</td>
<td>0.86</td>
<td>0.85</td>
</tr>
</tbody>
</table>

The results have indicated that people who experienced a budget contraction took on more (social) risk by engaging in dishonest behavior as compared to people who experienced a budget expansion. Participants in the budget contraction group reported higher numbers of correct answers than participants in the expansion condition, whereas the actual performance (as inferred from the control condition) between these groups did not differ significantly.

In Study 3, the researcher intends to test the limits of effects of income change on risk-taking by priming a social-market perspective. Building on the idea of two markets (Heyman and Ariely, 2004), I hypothesize that the effects of income change on risk-
taking is mostly applicable to situations where consumers use the monetary market perspective, and the effects will alleviate or disappear when consumers use the social market perspective.

**Study 3:**

*Participants, Experimental Design, and Procedure*

Fifty participants (24 women and 26 men, aged between 20 and 62 years, MD=35), recruited from an online subject pool, participated in the study in exchange for a $1.00 fixed fee and a performance-based bonus payment. Subjects participated in a real effort task for 16 periods. The effort task was identical to the one conducted in study 1.

Each participant was randomly assigned to either the “control” or the “social prime” condition. At the beginning of the experiment, participants in both groups had a high payment rate of $0.10 for each correct answer. After 8 periods, both groups completed the priming task before they received an income rate change. Participants were given a descrambling task that exposed them to either social (Matthey, 2010) or neutral words (Vohs et al., 2006). In cohere with this task, the participants were given a list of word-sets that each contained five words. They were furtherly instructed to use four of the given words to formulate a sentence. The descrambling task consisted of 20 sets of five jumbled words, and they had 3 minutes to create as many sentences as possible. In
the control condition, the phrases primed neutral concepts (e.g., “cold carpet ocean is water” became “ocean water is cold”). In the social-prime condition, half of the phrases primed social concepts (e.g., “help parent children table their” became “children help their parents”), whereas the remaining half consisted of neutral phrases. The manipulation was intended to activate social concepts within the minds of the participants.

After the income rate change, payments to participants in both groups decreased to a rate of $0.05 for each correct answer for the remaining 8 periods. When they finished the real effort task, participants were asked to provide their demographic information (language, age, gender, and education). Finally, two periods were randomly selected, and the earnings of the selected rounds were paid out as bonus payments.

Results and Discussion

The results of a repeated measures ANOVA on the dependent variable “risky choice” with the within-subjects factor “half” (rounds 1-4, rounds 5-8) and the between-subjects factor “treatment” (control, social prime) yield a significant interaction effect of $F(1, 48) = 5.50, p < .05, \eta^2 = .103$. Participants in the control group took more risk in the second half of the study ($M = 1.77, 95\% CI = [1.618, 1.922]$) than in the first half ($M = 1.68, 95\% CI = [1.532, 1.818]$). The difference was marginally significant, $F(1, 24) = 4.0, p = .057, \eta^2 = .143$. Participants in the social prime group took less risk in the second
half of the study than in the first half ($M_{1st} = 1.73 \text{ vs. } M_{2nd} = 1.66, p = 0.2$), but the difference was not statistically significant. Figure 3 displays risk-taking by experimental condition.

Figure 3. Risk-Taking (Study 3)

![Graph showing risk-taking by experimental condition](image)

The results demonstrate that people who experienced a budget contraction took on more risk in the neutral priming condition, whereas no such effect was observed in the social priming condition. Such a result has suggested that the adherence towards social concepts provides a psychological buffer against the negative effects of budget contraction on risk-taking.
Discussion

This chapter reports the results of three experiments that investigate the behavioral effects of budget contraction on financial and social risk-taking as well as on the role of the social market perspective on the investigated effect. The experiments demonstrate that budget contraction lead to excessive risk-taking in both the domains of finance and societal. After a cut in the rate of income, individuals increased their risk-taking in a financial lottery setting and increased their social risk by engaging in excessive cheating. Nevertheless, introducing a social market perspective that primed social values mitigated the negative effects of budget contraction on risk-taking. These results suggest that when the social concepts are triggered in the mind of the people, a psychological intermediary is created that limits the negative impact of budget contraction on risk-taking.

The findings of the first and third experiment distinguish between two alternative predictions regarding the effect of reference points on risk preferences (Koszegi and Rabin, 2006, 2007). The first of these is that prior losses introduce risk-averse behavior due to the hedonic editing employed by the individuals to make their prospect pleasant (Thaler and Johnson, 1990). The second perspective predicts that budget contraction puts participants below their reference point which represents their earning level before the income change. Kahneman and Tversky (1979) have argued that falling below the reference point induces risk-seeking behavior. Risk sensitivity theory (Mishra and Lalumiere, 2010) explains this by the high need created by disparity between an
individual’s present state and a goal or desired state. According to the risk-sensitivity theory, in situations of high need, decision-makers prefer high-risk options (Mishra and Lalumiere, 2010). The results of experiment 1 and 3 contribute to the literature on the effect of reference points on risk preferences by showing that the second of these perspectives appears more plausible. The results presented in this chapter suggest that people who experience economic hardship due to budget contraction may face additional adverse effects because of excessive risk-taking, further exposing them to the potential downside risk of losing much of their endowment/savings.

The results of the second experiment identify a circumstance under which people are more tempted to cheat. This finding is consistent with Grolleau et al.’s (2016) finding that when individuals are in a situation that is construed as a possible loss relative to a reference point (e.g., being fired, losing welfare benefits, facing an additional tax payment, retaining a customer), they seem to be more likely to engage in unethical behavior as compared to a situation framed as a gain relative to a reference point. This research contributes not only to the reference point literature, but also to the studies that have showcased that under certain circumstances psychological factors can predict unethical behavior better than economic factors. For example, John et al. (2014) have showed that the effect of performance-based pay-rates on dishonesty is dependent on the saliency of pay-rate inequality or prospect of higher pay-rate. This highlights that participants earning a low pay-rate are more likely to cheat than participants earning a high pay-rate, provided there is awareness of alternative pay-rates. Similarly, the
researcher has showed in this research that after a budget contraction, individuals cheated more when their pay-rate was lower, when the economic benefit of cheating was smaller.

The interplay between budget contraction and risk-taking has significant implications for managers and society at large. The current scenery of the corporations of the United States is comprised with a list of scandals signifying the presence of unethical behavior, like the Wells Fargo’s fake accounts scandal, the Volkswagen’s emission test cheating, the Barkley’s Libor rigging, and the Mylan’s Epipen price gouging. Also, over 1.2 million shoplifters and dishonest employees were apprehended, and more than $225 million were recovered from these people, solely within the realm of the 25 large retailers in the United States in 2014 (Jack L. Hayes International, Inc., 2015). A recent survey done by Association of Certified Fraud Examiners (2016) have estimated that the typical organization loses 5% of revenues in a given year as a result of fraud. Companies, their employees and their customers are known to be comprised with questionable ethical standards (Murphy and Laczniak, 1981; Bagozzi, 1995; Vitell, 2003; Mazar and Ariely, 2006). The current study has shown that such unethical behaviors could become more frequent during economic downturns. The budget contraction and pay cuts that are more likely to happen during recessions and economic hardships can cause people to engage in excessive cheating. Decision-makers should devote enough attention on the possible effects of their decisions that will create budget contraction to individuals’ behavior during economic downturns. When big numbers of people are facing budget contraction,
the psychological effects of these contractions on individuals could create a financial spillover.

A simple policy (whenever available) with the effects of budget contraction on risk-taking is priming social values. Building on Fiske’s relational theory (1992; see also Aggarwal, 2004) and Heyman and Ariely’s (2004) idea of two markets, the researcher have predicted and exhibited that the effects of budget contraction on risk-taking is mostly applicable to situations where consumers employ a monetary market perspective, and the effects will alleviate or disappear when the consumers are able to incorporate a social market perspective instead. Such adoption of social market perspective that creates a psychological hindrance to limit negative actions during budget contraction has been exhibited by the third experiment conducted in the current study.

It is important to note the limitations of the study. The first limitation is related to the relationship between the pay-rate change and fairness. In the present chapter, the pay-rate change was determined randomly, and was unexpected. The researcher was unable to provide for any warnings or rationale for the pay-rate change. Fair-wage hypothesis (Akerlof and Yellen, 1988) argues that workers withdraw effort proportionately when their actual wage falls short of their fair wage. Even though, the researcher did not find a decrease in effort after budget contractions, the study conducted failed to measure the notion of participants when concerned with the fairness of the decreased pay-rate fair. It is possible that the amount of time given for the tasks in Study 1 might have generate a
ceiling impact on the effort. Future research could explore whether the negative effects of budget contraction on risk-taking was due to fairness issues or not.

Secondly, the current chapter does not address the psychological process that causes the negatives effects of budget contraction. Understanding what moderates the effect of budget contraction through decreasing pay-rates on risk-taking is important. For example, John et al. (2014) argues that low earners might cheat more if they believe prior performance was used to determine pay-rates. Future research could help to develop further insight into the psychological processes underlying the behavioral patterns observed by individuals after experiencing budget contraction by imploring how individuals perceive the changes in their pay-rate.

Finally, the sample size of the experiments employed in this chapter was limited. All three studies have limitations with their subject size and pool. The studies in this chapter used a considerably representative sample, but all the participants were acquired from an online subject pool. These concerns about the subject pool could limit the generalizability of the findings. Future studies should use larger sample sizes and collect their subjects from both online and offline subject pools.
References


Chapter II

The Effect of Relative Performance Information on Performance and Motivation in a Learning Environment
Introduction

Firms often chose to provide relative performance feedback to their workers even though their compensation is not impacted by the performance of their peers and group members (Anderson et al., 1982; Wikoff et al., 1982; Nordstrom et al., 1990; Tafkov, 2013), and employees could obtain relative performance feedback via observing their peers. For example, bank managers disclose the number of new accounts opened by each teller to their tellers (Tafkov, 2013). In the similar manner, the retail stores disclose performance metrics of salespersons like average sales per hour, units sold, and dollars per transaction individually and relatively (O’Connell, 2008), even though these employees were not compensated based on these relative performance metrics (Hannan et al., 2013).

Managers can use the information pertaining to performance for both controlling and planning the work to enhance the productivity of the workforce. To determine whether providing RPI to employees will be beneficial to managers, one must be aware of its impact on the behavior of the employee. Previous studies found that RPI can improve performance with flat wage and piece rate incentive schemes in single-task environments (Kerr et al. 2007; Hannan et al. 2008; Tafkov, 2013). However, RPI can decrease performance with tournament incentive schemes in single-task environments (Hannan et al. 2008; Newman and Tafkov, 2014) and when individuals are compensated based on their effort allocations across tasks in multi-task environments (Hannan et al. 2013).
The performance improvement due to relative performance feedback has been explained by the social comparison theory (Festinger 1954; Suls and Wheeler 2000). According to this theory, individuals are inculcated with a desire to evaluate their opinions and abilities. For such an evaluation, they rely on the relative comparisons with individuals similar to themselves whenever the objective data is not available. Social comparison activated by RPI motivates higher effort and performance (Hannan et al. 2013). Previous studies assumed that the motivational effects of RPI due to social comparison are always positive with flat wage and piece rate incentive schemes in single-task environments; thus, the provision of RPI will enhance performance. This study extends prior research and contributes to the literature by examining the negative effects of RPI. The researcher hypothesis that RPI can decrease the performance by demotivating all or some of the individuals. When individuals work on a task they are not familiar with to be aware of the optimal strategy and require feedback to enhance the performance, attainment of RPI can lower the motivation for higher effort and performance. The theory behind this prediction is that providing RPI might cause individuals to perceive the goal they have for the task unattainable and cause them to give up (Locke and Latham, 1990) leading to a deteriorated level of performance. Moreover, providing RPI can negatively affect performance of those who have not given up but performing worse than they expected due to the cognitive effort. In coherence with the poor performance, they would exert themselves on non-task related activities like
worrying about their performance or how it affects the impressions of peers or designing a competitive strategy (Hannan et al., 2008).

The researcher conduct two experiments to investigate this hypothesis. First, whether relative performance feedback can affect performance negatively when the task at hand is not a familiar one and requires feedback for optimization and, second, how relative performance feedback affects motivation, enjoyment, and perceived performance. The first experiment employed a variation of the investment task of Gneezy and Potters (1997) as an unfamiliar task for the participants to test the negative effects of RPI. The researcher also investigated how the type of RPI (no RPI, public, private) affects performance.

The second study investigates how relative performance feedback affects motivation, enjoyment, and perceived performance (absolute and relative) directly. Specifically, the researcher will test whether providing RPI will decrease the motivation, enjoyment, and perceived performance while working on a perceivably easy task that leads individuals to switch the task they are working on when the option to switch is provided.

Consistent with my predictions, I find that providing RPI during the investment task influenced performance negatively. Participants who received relative performance feedback performed worse than the participants who did not receive relative performance.
feedback. The investments and earnings of control group participants increased as periods progressed; however, the investments and earnings of the RPI groups did not increase. The results of the second study revealed that providing RPI to participants while they are working on a perceivably easy task decreased the enjoyment and perceived absolute and relative performance of the participants.

In section II, the researcher discusses the related literature and present the research predictions in section III. Next, in section IV, the researcher contends the experimental design and present the results. Finally, in section V, the researcher posits the results and draw conclusion from the same.

Related Literature

Within the fields of economics and psychology, the consequent literature inform about the understanding towards the effects of RPI on performance. The former is based on agency theory, whereas the latter is based on social comparison theory. Agency theory ties RPI to performance by linking compensation to peer performance. An agent’s performance is dependent on agent’s effort, and uncertainty. Agency theory posits that in a multi-agent environment, when the employee compensation contract and performance evaluation is linked to peer performance, RPI can help the principal, employer or the manager, to filter out the common uncertainty from an agent’s contract when it is not possible to measure the actual effort of an agent (Frederickson, 1992; Holmstrom, 1982;
Mahlendorf et al. 2014). Common uncertainty refers to the external factors that impact the performance of the agent/employee within the reference group (Kren, 2002). For example, uncertainty from the weather conditions will be a common uncertainty for all the tire salesmen who are assigned to sell winter tires. Hence, when agents face common uncertainty, RPI should be included in the compensation contract (Holmstrom, 1982). However, when there is no underlying common uncertainty to filter out, RPI could still be useful under a tournament contract where the payment is determined only on one’s ordinal rank in the tournament. Since tournaments eliminate common uncertainty, they induce higher effort from risk-averse agents, i.e. individuals who prefers guaranteed payment in present over a higher future payment and seek security and guarantee of the attainment of desirable outcome (Lazear and Rosen, 1981; Nalebuff and Stiglitz, 1983). Providing RPI in a tournament informs the agent about the possibility of winning the tournament and earning the reward (Tsetlin et al. 2004; Casas-Arce and Martinez-Jerez, 2009). Economic theory posits that RPI should not affect employee’s effort and performance when employee compensation is not tied to peer-performance (Frederickson, 1992; Hannan et al., 2008).

The literature in psychology pertaining to social comparison theory (Festinger, 1954; Suls and Wheeler, 2000), predicts that when employee compensation is not tied to peer-performance, RPI will affect effort and performance (Tafkov, 2013). According to the social comparison theory, individuals compete not only for monetary rewards, as economic theory assumes, but also for non-monetary rewards, such as performance pride.
and self-image enhancement (Smith, 2000; Greenberg et al., 2007), and strive to outperform others (Festinger, 1954; Frederickson, 1992). Social comparison theory posits that in order to evaluate their own abilities, people have a drive to compare themselves with others (Suls and Wheeler, 2000; Brown et al., 2007; Tafkov, 2013), and this comparison shapes self-image, as people have the need to maintain a positive self-image (Tesser, 1988; Beach and Tesser, 1995). Providing RPI informs individuals about their abilities and skills in relation to others, hence, stimulates greater effort and a motivation to outperform those with whom one is being compared (Festinger, 1954; Frederickson, 1992). In other words, individuals compete and try to outperform others (Brown et al. 2007; Garcia and Tor, 2007) to seek positive feelings about self and to avoid negative ones (Lazarus, 1991; Smith, 2000). Hannan et al. (2013) refers to this social comparison mechanism as the motivational effect for RPI.

Previous research on the impacts of RPI on performance, when compensation is not tied to peer performance, is in general consistent with social comparison theory. Hannan et al. (2008), Murthy (2010), and Tafkov (2013) have demonstrated the positive effect under individual performance-based contracts (e.g. piece rate, quota based, budget-based, etc.); whereas, Kerr et al. (2007) have demonstrated the positive effect of RPI under a flat-wage contract where the payment is fixed and does not depend on the effort and performance. Tafkov (2013) have also showcased that the positive effect of RPI could be experienced under a flat wage contract; however, this effect would be less effective under a flat wage contract than under an individual performance-based contract.
Murthy and Schafer (2011) have investigated the effects of providing RPI on a repetitive task and their results have demonstrated a positive effect of RPI. They have also found that when RPI is framed in a positive (good job) manner, it has a positive effect on performance.

Though, most of the literature have examined the relationship between RPI and performance when employee compensation is not tied to peer-performance to find a positive effect of RPI on performance, there are limited studies that have posited the negative effects of RPI on performance. For instance, Hannan et al. (2008) have found that under a tournament incentive scheme, precise relative performance feedback worsens the performance of the participants. Hannan et al. (2013) have exhibited that in a multi-task environment, RPI induces an effort distortion effect which may result in the distortion of effort allocations across tasks, away from the firm-preferred allocations. The distortion of efforts happens in multitask environments, when the employees allocate their effort among tasks in the opposite direction of firm-preferred proportions to excel in one task while risk doing poorly in others. Hannan et al. (2013) have shown that when the individuals are presented with the option to change the allocation of effort to different tasks, the provision of RPI can distort the effort allocation and decrease performance. The current study will expand this research by showing the negative effect of RPI on performance under an individualistic, performance-based incentive scheme. In the next section, the researcher has developed a conceptual basis for predicting a negative effect of RPI under an individual incentive scheme.
The Present Work

It is commonly believed that providing feedback improves the performance, and also, the provision of more detailed information systems help managers to make better decisions (Cooper et al., 1992; Cooper and Kaplan, 1998). Generally, various studies on RPI present in the distinctive literature body attest to such a belief; however, in the current study, the researcher argues that as suggested by Kluger and DeNisi (1996), feedback may not always be a positive force and some effects of (relative performance) feedback could be negative. If the provision of (relative performance) feedback could reduce the performance of managers, employees and firm performance, the correspondingly, sharing of this information may have negative impact.

The researcher argues that depending on individuals’ abilities and perceptions of success, relative performance feedback could affect performance positively or negatively. Specifically, the researcher predicts that when individuals are working on a task they are not ordained, they require feedback to judge their performance. For such a situation, performance feedback, particularly showing that one does relatively poorly compared to others, can affect their performance negatively by interfering with the learning process.

Different streams of theoretical research on feedback (e.g., Bandura, 1991, social cognition theory; Mikulincer, 1994, learned helplessness theory; Podsakoff and Farh, 1989, control theory; Locke and Latham, 1990, goal setting theory) argue that to achieve goals or standards, people use feedback to evaluate their performance relative to their
goals. The result of a comparison of performance feedback to a goal or a standard creates a feedback sign (positive or negative evaluation of one's performance relative to the goal) (Kluger and DeNisi, 1996). Positive feedback increases effort, provided that the feedback indicates that the goal is attainable, through its cognitive effects such as increasing goal commitment (Locke and Latham, 1990) and perceptions of self-efficacy (Bandura, 1991), as well as positive effects on motivation (Kluger and DeNisi, 1996). However, when individuals receive negative feedback and they perceive their goals or standards to be unattainable, individuals lose faith (Locke and Latham, 1990), in accordance with which their performance gets negatively affected. Moreover, Hannan et al. (2008) argues that the provision of RPI can negatively affect performance of those who have not given up but are performing worse than their own expectations. This might further reduce their effort for task-related strategy by exerting cognitive effort on non-task related activities such as designing a competitive strategy or worrying about their performance (Kanfer and Ackerman, 1989), or by trying risky strategies in belief that they have nothing to lose (Camerer and Hogarth, 1999). Potential drawbacks of (relative performance) feedback is not just limited to low performance of the individuals and reduced efforts for task-related strategies after receiving negative feedback compare to their goals or standards, or after viewing others perform better. High performing individuals can compare themselves to others, and comparing oneself to others that are performing worse, can raise self-esteem (Wood, 1996). These high performing individuals can become complacent after viewing others performing inferior than them (Murthy, 2010).
In addition to the possible negative effects of relative performance feedback, the researcher will investigate the type and content of the RPI (public vs. private) and its impact on the performance. Hannan et al. (2008) have found that the precision or the specific content of relative performance feedback does not change the positive relationship between providing RPI and performance under an individual incentive scheme; however, providing relative performance feedback had a negative impact on performance under tournament incentive scheme only when the feedback is sufficiently precise. Recently, Tafkov (2013) argues and demonstrates that, both public and private RPI, have a positive effect on performance, and the effect is greater when RPI is public. Hannan et al. (2013) have exhibited a similar finding that when RPI is public rather than private, both motivation and effort distortion effects of RPI are greater. Investigating the type of RPI with possible negative effects of RPI permits the investigation of their potential interaction. Conceivably, the negative effects of RPI could be mitigated when RPI is private rather than public because publicity plays an important role in social comparison, and inferior and blameworthy attributes of individuals create less shame if they are kept private (Smith, 2000). On the contrary, the negative effects of RPI could be larger when RPI is private rather than public, due to the greater effect of public comparisons than those of private comparisons on self-image (Brown and Gallagher, 1992; Smith, 2000). The involvement in social comparison will be greater when RPI is public because of the greater impact of public comparison on individual self-image (Tafkov, 2013).
To summarize, the economics literature does not predict that relative performance information influences the performance when the compensation is not tied to peer performance (Frederickson, 1992). However, when peer performance is tied to compensation, economics theory predicts that the provision of the feedback will enhance the performance (Holmstrom, 1982; Lazear and Rosen, 1981; Nalebuff and Stiglitz, 1983). Psychological theories predict that such a provision can impact the performance, even when the compensation is not related to the peer performance. Social comparison theory have predicted that individuals will compete for non-monetary rewards such as pride and self-image enhancement along with monetary rewards (Smith, 2000; Greenberg et al. 2007) and strive to outperform others (Festinger, 1954; Frederickson, 1992).

Providing RPI informs individuals about their abilities and skills in relation to others, hence, stimulates greater effort and a motivation to outperform those with whom one is being compared (Festinger, 1954; Frederickson, 1992). An emerging stream of experimental research have demonstrated both the positive effects of relative performance information under a flat-wage contract (Kerr et al., 2007; Tafkov, 2013), under individual performance based contracts (Hannan et al., 2008; Murthy, 2010; and Tafkov, 2013), and on repetitive tasks (Murthy and Schafer, 2011); and negative effects of relative performance information under a tournament incentive scheme (Hannan et al., 2008) and in a multi-task environment (Hannan et al., 2013). In this chapter, the researcher will demonstrate conditions where providing relative performance feedback has negative effects on performance under individual performance based contracts.
To test the predictions, the research has conducted two laboratory experiments, which will be described in the next section. In the first study, the researcher establishes that RPI could have negative effect on performance under individual compensation scheme in single-task environments. In the second study, the researcher shows that providing relative performance feedback can decrease the task enjoyment and perceived (absolute and relative) performance on the task.

**Study 1:**

The first study is designed to investigate how relative performance information (RPI) might affect task performance. In contrast to previous works on RPI which have exhibited that relative performance information improves task performance, the researcher predicts that for unfamiliar tasks, RPI might have detrimental effects. To test this effect, the researcher will employ Myopic Loss Aversion (MLA) theory (Benartzi and Thaler, 1995). MLA was formulated by Benartzi and Thaler (1995) to explain the equity premium puzzle (Mehra and Prescott, 1985), a phenomenon that describes the abnormally high equity returns offered by stocks over government bonds. MLA explains this by combining two psychological concepts, loss aversion (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992) and mental accounting (see Kahneman and Tversky, 1984; Thaler, 1985). Loss aversion means that the pains experienced by losses are treated more heavily than the gains achieved by equal sized wins; and mental accounting refers to the inappropriate treatment of time dimension (Gneezy and Potters,
For example, evaluating the long-term investments based on their short term
returns (Fellner et al., 2009). In the next section, the researcher will explain the design of
the experiment that is employed to test this prediction.

**Participants, Experimental Design, and Procedure**

Ninety participants, recruited from the UCR SoBA Behavioral Lab student
subject pool, participated in the study in exchange for performance-based remuneration.
The experimental treatment is a variation of the investment task of Gneezy and Potters
(1997) and Fellner et al. (2009). The computerized sessions were run using the software
z-Tree (Fischbacher, 2007).

Subjects participated in a real effort task for 18 periods, and each participant was
assigned to a group of five subjects at random. In each round, participants received an
endowment of 100 ECU (experimental currency units), which were equivalent to $0.50.
In each round, participants were asked to decide how many ECUs from their endowment
they would like to invest in a risky lottery (0 ECU to 100 ECU). In any given round, if
the participants invested an amount X in the lottery, they lost the amount X with a
probability of $2/3$ (66.67%) and received the following gain: $100 – X$, or won the amount
$2.5 X$ with a probability of $1/3$ (33.33%) and received the following gain: $100 + 2.5 * X$.
The outcome of the lottery relied on a random number that was drawn from a uniform
distribution, which was identical for all participants in the experiment. The random
number was determined anew every round. Unlike the Gneezy and Potters’ (1997) and
Fellner et al.’s (2009) investment tasks which were run individually, the researcher has run this task in groups of 5 participants to introduce the relative performance feedback into the design.

Table 5. Experiment Conditions (Study 1)

<table>
<thead>
<tr>
<th>Condition</th>
<th>RPI</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition 1</td>
<td>No RPI</td>
<td>High</td>
</tr>
<tr>
<td>Condition 2</td>
<td>No RPI</td>
<td>Low</td>
</tr>
<tr>
<td>Condition 3</td>
<td>Private RPI</td>
<td>High</td>
</tr>
<tr>
<td>Condition 4</td>
<td>Private RPI</td>
<td>Low</td>
</tr>
<tr>
<td>Condition 5</td>
<td>Public RPI</td>
<td>High</td>
</tr>
<tr>
<td>Condition 6</td>
<td>Public RPI</td>
<td>Low</td>
</tr>
</tbody>
</table>

To analyze the impact of Myopic Loss Aversion (MLA) and Relative Performance Information (RPI) on risky investments, participants were randomly assigned to one of the six conditions (see Table 5) based on RPI and feedback frequency. Both RPI (present vs. absent) and feedback frequency (high vs. low) was varied in two distinct between-subjects levels. Nested within the RPI present condition (also between-subjects), the type of RPI varied at two levels (private or public). As a result, each participant was randomly assigned to one of six conditions unbeknownst to them. The experiment was conducted as an eighteen rounds sequence; and the results of each round was considered as a within-subjects factor.
The investment feedback was either given after each single period (High) or provided in aggregated form for a respective sequence of three periods (Low). The investment horizon over which participants had to commit in the high frequency condition was one period, whereas the investment horizon in the low frequency condition was three periods. In the high frequency condition, subjects could decide on the risky investment in each single round and therefore had high flexibility in changing their investments. In the low frequency condition, subjects decided every third round about their investment levels, which was binding for the next three rounds. Here, subjects faced the restriction that investment levels had to be identical for all three rounds. In this case, flexibility is low.

In the no RPI condition, in each round participants learned whether or not they had won and received feedback about their earnings in that round. In the private RPI condition, participants learned whether or not they had won, their earnings in that round, and their performance rank within their group of five subjects. In the public RPI condition, participants received their own performance rank and the ranks of each of the other four participants in their group along with the result of the lottery and the amount of their earnings.

Results and Discussion

A 3 “RPI condition” (no RPI, private, public) × 2 “feedback frequency” (high vs. low) × 3 “experience” (round 1-6, 7-12, 13-18) within-subject ANOVA on the dependent
variable “investment” revealed a significant interaction of Experience × Frequency, F (2, 82) = 5.08, p < .008, η² = .110. The three way interaction of Experience × RPI × Frequency was not significant. Participants in the low frequency group performed better by investing higher amounts in the lottery (M = 49.385, 95% CI = [42.617, 56.153]) than participants in the high frequency group (M = 39.211, 95% CI = [32.443, 45.979]), confirming myopic loss aversion. Figure 4 displays the mean investment amount by frequency conditions.

Figure 4. Mean Investments Amounts in the Lottery by Frequency (Study 1)

Our analysis on investment amounts also revealed a significant interaction of Experience × RPI, F (2, 83) = 4.91, p < .01, η² = .106. Participants in the no RPI condition invested higher amounts in the lottery (M = 46.513, 95% CI = [38.224,
than participants in both, the private RPI (M = 40.644, 95% CI = [32.356, 48.933]) and the public RPI (M = 45.737, 95% CI = [37.448, 54.026]) condition. Figure 5 displays average investments for each RPI condition across rounds.

Figure 5. Mean Investments Amounts in the Lottery by RPI (Study 1)

The results of the study have demonstrated that the participants experienced myopic loss aversion, and that they invested higher amounts and performed better when they received less frequent feedback than when they received more frequent feedback. The results also show that RPI has an overall negative effect on people’s investment performance. Participants in both RPI conditions invested less in the lottery than in the RPI control condition without any performance feedback of participants’ group members.

To better understand the underlying mechanism that leads to the negative effect of RPI on performance, the researcher has run a supplemental analysis. The researcher has
tested the effect of ranks on the investment amounts in the next experimental session (investment \( t+1 \)). The test of between-subjects effects find a significant difference for the amount of investment made after getting ranked a specific rank in the previous session (\( F(4, 655) = 19.472, p = .000, \eta^2 = .106 \)). Participants who ranked high (rank: 1) or ranked low (rank: 4, 5) invested higher amounts than the participants ranked in the middle (rank: 2, 3). Figure 6 displays average investments for each rank. This finding is consistent with Garcia et al.’s (2006) argument that the competitive action resulting from social comparison depends on a proximity to a meaningful standard such as being close to the top or bottom of a ranking scale.

Figure 6. Mean Investments Amounts in the Lottery by Rank (Study 1)

To understand what causes the individuals who were ranked in the middle to give up or perform worse, in the next study, the researcher will test whether the presence of RPI changes the behavior of individuals by affecting motivation, excitement, and
perceived performance. The researcher predicts that for tasks that are unfamiliar and (perceivably) easy, performance feedback, particularly showing that one does relatively poorly compared to their expectation, gets people to switch tasks, when possible, to find a task where they are “better”. The next section explains the methodology of the experiment used to test this prediction.

**Study 2:**

*Participants, Experimental Design, and Procedure*

Seventy-two participants (44 women and 28 men, aged between 20 and 39 years, MD=21), recruited from the UCR SoBA Behavioral Lab student subject pool, participated in the study in exchange for performance-based remuneration. The experimental treatment is a variation of Davis’ (2013) experimental setup of the Wason’s (1960) Rule Discovery Test that is adjusted to include RPI. The Wason Rule Discovery Test investigates strategies used by people when testing hypotheses. Participants were shown the following introduction on the computer along with a separate paper copy as a reminder:

“You will be given three numbers that are related somehow. For example: 3, 5, and 15. This is called a triple. There are many possible rules that could relate these three numbers. We have selected only one
of them. The rule that we selected is called the Actual Rule. You will not be given the Actual Rule. Your task is to discover it. The initial triple on the next page is an example drawn from the Actual Rule."

As an example, participants were told that ‘2-4-6’ conforms to the actual rule. This example triple is called initial triple, and it was presented at the top of each page. When the initial triple was presented for the first time, participants were asked to describe the rule they thought relates to the tree numbers. In the next page participants were instructed to propose a new triple to test their hypothesis about the actual rule. Participants had three trial rounds and 10 actual rounds where they could propose new triples to get feedback about the fit of the triple they provided to the actual rule. Fit (FIT or DNF) feedback was provided at each round. When the proposed triple was correct, participants were shown FIT, if it wasn’t correct, they were shown DNF (Does Not Fit). After 10 rounds participants were asked to guess the actual rule and to describe it verbally.

Participants were randomly assigned to either the “control” or the “feedback” condition. Participants in the “control” group did not receive any feedback after they provided their answer for the actual rule, and they moved to the next part of the experiment immediately after submitting their proposed triple; alternatively, the “feedback” group received relative feedback based on the fit feedback they received from the trials with regards to their proposed triples. After the participants submitted their
answer for the actual rule, participants in the “feedback” condition were asked to raise their hand and wait for the experimenter to give them feedback. The feedback provided to participants related their performance to the performance of subjects who previously participated in the Wason Rule Discovery Test by using the raw data of Davis (2013). Participants were told in which quantile they were ranked based on their answers. They were also told what percentage of subjects scored higher than them.

Then, the participants were asked to make a choice between continuing with the rule discovery task for 10 more rounds to revise and improve their answers or to switch to a different task altogether. No detail was provided about the new task. After participants made their choice and finished this second part of the study, they were asked to think back to the rule discovery task and their performance feedback and answered four questions on motivation, enjoyment, and perceived performance. The first question was asked to measure the motivation of the participants with regards to the Wason Rule Discovery Test: “How motivated are you to learn more about the rule discovery task?” The second question was asked to measure the enjoyment of the participants while working on the Wason Rule Discovery Test: “How much did you enjoy trying to solve the rule discovery task?” The third and fourth questions were asked to measure subjective performance, separately for absolute and relative performance: “How well do you think you have performed on the rule discovery task?” and “Relative to other participants in the experiment what is your impression of your performance?” The questions were asked on
5 point Likert scales ranging from “not at all” to “very much” except the fourth question, which ranged from “top 20 percentile” to “bottom 20 percentile”.

Results and Discussion

The result of a univariate regression analysis on our depended variables (switch decision and motivation, enjoyment, and perceived performance scales) with the between-subjects condition (control vs. treatment), controlling for the actual scores, yield mixed results. A higher number of participants in the “feedback” condition ($M_{\text{control}} = 0.61, n = 26/36$) chose to switch to the new task compared to the “control” group ($M_{\text{treatment}} = 0.72, n = 22/36$), but the difference was not statistically significant, $F (1, 69) = 1.58, p < .21, \eta^2 = .022$ (See Table 6). Participants in the “control” group reported a higher degree of motivation to learn more about the rule discovery task than participants in the “feedback” group ($M_{\text{control}} = 3.67$ vs. $M_{\text{treatment}} = 3.36$), but the difference was not statistically significant, $F (1, 69) = 1.21, p < .28, \eta^2 = .017$.

Table 6. Task Switches (Study 2)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of Switch</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>22</td>
<td>61%</td>
</tr>
<tr>
<td>Feedback</td>
<td>26</td>
<td>72%</td>
</tr>
</tbody>
</table>
There was, however, a significant effect of feedback on the mean level of enjoyment received from trying to solve the rule discovery task, $F(1, 69) = 4.43, p < .039, \eta^2 = .060$. Participants in the “control” group enjoyed trying to solve the rule discovery task significantly more than the participants in the “feedback” group, $M_{\text{control}} = 3.89$ vs. $M_{\text{treatment}} = 3.31$. The effect of feedback on perceived performance of the subjects was significant for both absolute ($F(1, 69) = 6.19, p < .015, \eta^2 = .082$) and relative performance ($F(1, 69) = 4.52, p < .037, \eta^2 = .061$). The mean performance level reported by participants in the “control” group was significantly more than the participants in the “feedback” group, $M_{\text{control}} = 3.75$ vs. $M_{\text{treatment}} = 3.14$. And, the relative performance level reported by participants in the “control” group was significantly more than the participants in the “feedback” group, $M_{\text{control}} = 2.78$ vs. $M_{\text{treatment}} = 3.00$ (reverse coded). Figure 7 displays the mean scores for motivation, enjoyment, perceived absolute performance, and perceived relative performance scales by experimental condition.

Figure 7. Dependent Variables (Study 2)
The results partially support the prediction of the possible negative effects of feedback on performance. The researcher has demonstrated that providing feedback can decrease the enjoyment and perceived performance of people. Even though, the researcher did not find a significant difference in the percentage of task switching and motivation, this could occur due to the limited sample size, or other reasons like boredom, loss of interest on task, the perception of fulfilment of the task, or fatigue that would affect motivation of participants in both conditions. More than half of the participants in both, the “control” and the “feedback” condition chose to switch to a different task instead of continuing to work on the rule discovery task which limits our ability to test the effect of RPI on the task switching behavior and motivation. In future studies the experimental design should be changed to isolate RPI from other factors that are leading participants to switch the task.

Discussion

This chapter reports the results of two experiments that investigate the negative effects of RPI on performance in a setting where employees are not compensated based on peer performance. The results of the experiments suggest that RPI has a negative effect on people’s performance when they are working on a task in which they lack expertise and need feedback to learn the optimal strategy. Such an effect could be attested to the decrease in the task enjoyment and perceived performance experienced when relative performance feedback is provided.
Consistent with the findings of Gneezy and Potters (1997) and Fellner et al. (2009), participants in the first study experienced myopic loss aversion, and the participants who received less frequent feedback invested higher amounts and performed better than the participants who received more frequent feedback. Moreover, the results of the first study demonstrated that participants working on an investment task experienced negative effects of relative performance feedback. Participants who received RPI, invested less in the lottery than participants in the RPI control condition who did not receive any performance feedback. Subsequent analysis on the specific effect of rank on performance revealed that the negative effect of RPI on performance is only experienced by participants who ranked in the middle of their group.

This study contributes to relative performance feedback research that focuses on the effects of RPI where compensation is not tied to peer performance and rely solely on individual performance. In congruence with the findings of Kluger and DeNisi’s (1996), the current study has demonstrated that the impact of feedbacks are not necessarily positive. In contrast with the findings of the previous research on the effects of RPI on performance under individual performance based contracts, when compensation is not tied to peer performance (Hannan et al., 2008; Murthy, 2010; and Tafkov, 2013) have highlighted positive effects on performance the current study demonstrated that provision of RPI when the task distributed is unfamiliar and tasks which are perceived to be easy can aggrieve the individuals who are not performing well. The results from the current
study have discovered a boundary condition to the common belief that providing feedback improves performance and more detailed information systems help managers make better decisions (Cooper et al., 1992; Cooper and Kaplan, 1998).

The current findings are not necessarily denying the positive motivational effect of RPI on performance; however, it just supports the findings of Hannan et al. (2008) and Hannan et al. (2013) that posit that the provision of RPI, while generating a positive impact, can lead to a secondary negative effect that can offset the motivational benefits. Similar to Hannan et al. (2008), the research has discovered that providing RPI deteriorates the performance of the participants who receive feedback indicating the lack in their performances, and when these participants are representing the majority, RPI can negatively impact the mean performance levels of the group. Additionally, the supplemental analysis indicated that the participants who were ranked close to the top or bottom of the ranking scale performed better than the participants who were ranked in the middle of the ranking scale. This finding is consistent with García et al.’s (2006) findings that competitive action resulting from social comparison depends on a proximity to a meaningful standard.

The results of the second study demonstrated that providing relative performance feedback impacts enjoyment, and perceived performance (absolute and relative) in a negative manner when the task given is unfamiliar and is perceived to be easy (i.e. Wason’s (1960) Rule Discovery Test). However, the results did not find a significant
behavioral effect, possibly due to the limitations of the study. Firstly, the study had a small sample size (72 participants) which could limit the ability of the researcher to measure the variability in the binary task switching-behavior measure. Secondly, it was not clear from the design, whether the behavioral effects (switching tasks) was due to the treatment or other reasons such as fatigue, boredom, loss of interest, or variables of such measure. More than half of the participants in both treatment and control conditions displayed the switching behavior, which was not expected. Those belonging in the control condition were expected to not switch tasks since their perceived performance levels was high and they were not provided with the feedback to alter the belief. In the future studies, the design of the study should be changed to isolate the behavioral effect of RPI from any alternative reasons.

Finally, the results of the current study have important implications for both practice and theory. The ordained findings could contribute to the understanding of successful information system design in firms, particularly on how and when managers should provide relative performance feedback. When managers are able to provide RPI to its employees, the results suggest that the decision to provide RPI should depend on the type of the task, employees’ expertise, and perceived difficulty of the task by employees. Providing RPI on a task that is perceived to be easy by employees, and who are not experts on the task and need to improve their performance could negatively affect the performance by decreasing the task enjoyment and perceived performance.
References


Conclusion
This dissertation explored the effects of current changes to the nature of work on individuals’ performance, with an emphasis on the understanding of how situational factors affect individual performance. The focus of this dissertation was on the behavioral effects of changes in pay rate and feedback type.

The first chapter recognized the importance of understanding the behavioral effects of budget contraction arising from decreased pay rate for managers and policy makers in times of economic downturn. Individuals took more risk on an investment decision when their pay rate was lower. Moreover, individuals who experienced a budget contraction compared to individuals who experienced a budget expansion took on more social risk by engaging in more dishonest behavior (cheating more). Finally, this chapter demonstrated that social concepts could be used as a psychological buffer against the negative effects of budget contraction. While individuals who were primed with neutral concepts took on more risk after experiencing a budget contraction, individuals who were primed with social concepts did not change the amount of risk they took after experiencing budget contraction.

The second chapter investigated the role of employee expertise, learning process, and task expectations when Relative Performance Information (RPI) is provided. In an individual performance-based investment task, providing RPI had negative effects on performance. On average, individuals who received RPI during the task invested less money in the lottery and performed worse than the participants who did not receive any
performance feedback. Among the individuals who received RPI, subjects who placed at the top of or at the bottom of the ranking scale invested higher amounts than the participants ranked in the middle. Moreover, the second chapter demonstrated that providing RPI on a seemingly easy and unfamiliar task decreases the enjoyment of the task and perceived performance (absolute and relative) on the task. Individuals who received feedback reported enjoying the task less and performing worse than the individuals who did not receive any feedback.

In our current day and age, in which companies are experiencing changes due to the external factors like advancements in technology, changes in the economic environment, or changes due to internal factors, understanding how these changes affect employee performance is crucial. Managers should understand the effects of change before planning and executing any change in their firm. The findings of this dissertation illuminate the effects of budget contraction and feedback systems on performance.

The first chapter demonstrated that budget contractions arising from reduced pay rates could change the risk-taking behavior of individuals and lead them to take more financial risk by making risky investments or social risk by acting dishonestly and cheating. Furthermore, the chapter presented a simple policy measure to mitigate the negative effects of budget contraction. During economic downturns, managers can use strategies to activate social concepts in employees’ mind to create a psychological buffer for employees against the negative effects of budget contraction on risk-taking.
The second chapter highlighted the importance of understanding the employees’ familiarity and expectations about the task during information system design in firms. This chapter demonstrated that providing Relative Performance Information (RPI) can negatively affect performance via decreasing participants’ enjoyment and perceived performance. Managers should be more cautious about or avoid providing RPI when employees are inexperienced or when the task is unfamiliar and perceivably easy.

Along with its contributions, this dissertation also has some limitations. First, studies have limitations with their subject size and pool. Studies in both chapters have limited sample sizes. The studies in the first chapter used considerably representative samples, but all the participants were acquired from online subject pools. Although the subjects in the second study were not acquired from an online source, all the participants were university students. These concerns about the subject pool could limit the generalizability of the findings.

Second, some of the studies had design issues. When testing the effects of pay rate changes, participants were not given any explanation on why these changes were happening, and this could have caused participants to judge the fairness of the study and affect their performance. Even though no decrease in effort was observed after budget contractions, whether participants found their decreased pay rate fair was not measured.
Future research could explore whether participants find budget contractions fair and examine the role of fairness on the negative effects of budget contraction on risk-taking.

Finally, it was not clear from the design used in the final study whether the tested behavioral (task switching) effects of providing RPI were happening due to the feedback or other reasons like fatigue, boredom, or loss of interest. Future studies should pretest the task to prevent any innate boredom or lack of interest concerns with the initial task for the measured behaviors.