

**The Balanced Scorecard as a strategy evaluation tool:
The effect of motivated reasoning and dissent
on information search and strategy evaluation decision**

by

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Abstract

Motivated reasoning theory suggests that motivation may lead individuals to search out information that supports their beliefs. Therefore, it is reasonable to ask the following questions. If motivation can affect information search behavior, how do individuals search information when they are prone to motivated reasoning? Since individuals are inclined to employ heuristics, what is the difference between motivated and non-motivated individuals when searching information? Furthermore, if motivated reasoning leads to suboptimal decisions, how can we mitigate the bias by manipulating the information search mechanism? This study examines whether motivation to justify a course of action, due to one's own involvement in the initial selection of the strategy, is exhibited in information search behavior. This present study also investigates how information search bias arising from motivated reasoning can be mitigated by applying dissent in the form of a devil's advocate (DA) view.

In a 2 x 2 between subject design experiment, an eye-tracking device was used to record and measure information search behavior of individuals while evaluating a Balanced Scorecard (BSC) data. Consistent with my expectation of motivated reasoning, I showed that participants who were involved in the initial implementation of BSC were motivated to search for information in a more directive way, compared to those who were not involved in the implementation. The results are also consistent with the prediction of the role of DA in stimulating better cognitive processes, such that, compared to participants in the non-DA group, those in the DA group will access a wider range of information by employing a sequential search. Interestingly, I discovered that subjects who employed a directive were more likely to rate the new strategy as a success than those who employed a sequential search. Furthermore, this result shows how DA can change the behavior of individuals in searching and using information, which can in turn lead to a better decision.

Keywords: Motivated reasoning; confirmation bias; dissent; Balanced Scorecard; human information processing; eye tracking

*To my lovely wife Poppy Lumbantobing,
and to my wonderful children,
Zephan Panggabean and Jordanka Panggabean,
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Table of Contents

Approval.....	ii
Ethics Statement.....	iii
Abstract.....	iv
Acknowledgements.....	vi
Table of Contents.....	vii
List of Tables.....	ix
List of Figures.....	x
Executive Summary.....	xi
Chapter 1. Introduction.....	1
Chapter 2. Literature Review and Hypothesis Development.....	8
2.1. Balanced Scorecard.....	8
2.2. Motivated Reasoning.....	11
2.3. Information Search Behavior.....	15
2.4. Sequence and Latency of Information Search.....	18
2.5. Dissent (Devil's Advocate (DA)).....	22
2.6. Moderating Effect of Devil's Advocate on Directional Motivated Reasoning.....	26
2.7. Information Search and Decision.....	27
Chapter 3. Methodology.....	30
3.1. Overview.....	30
3.2. Experimental Materials.....	30
3.3. Participants.....	32
3.4. Design.....	33
3.5. Procedure.....	34
3.6. Control Variables.....	39
3.7. Dependent Variables.....	39
3.8. Testing the Hypotheses.....	40
Chapter 4. Results.....	42
4.1. Post experiment analysis of power.....	42
4.2. Randomization Check.....	42
4.3. Manipulation Check.....	48
4.4. Hypothesis Tests.....	51
4.4.1. Hypotheses 1 and 2.....	55
4.4.2. Hypotheses 3 and 4.....	56
4.4.3. Hypotheses 5 and 6.....	58
4.4.4. Hypotheses 7 and 8.....	59
4.5. Supplemental Analysis.....	64

Chapter 5. Discussion and Summary	68
5.1. Discussion and Implication of Research	68
5.2. Limitations	73
5.3. Future Research.....	74
References 77	
Appendix A. The Locarna Eye-Tracking Device	87
Appendix B. Calibration System.....	88
Appendix C. Experimental Materials	89

List of Tables

Table 3-1.	Task and Procedure.....	37
Table 4-1.	ANOVA test of randomization check	43
Table 4-2	Factor Loadings for the rotated factors.....	44
Table 4-3.	Mean responses of BSC understanding and BSC understandability for each treatment	47
Table 4-4.	Mean responses to questions regarding involvement manipulation by treatment ^a	49
Table 4-5.	Mean responses to questions regarding DA manipulation by treatment ^a	50
Table 4-6.	Descriptive statistics of item sequence (ISEQ) and time difference between selected and non-selected measures.....	52
Table 4-7.	Analysis of variance (ANOVA) results of the effects of involvement and dissent (DA) on the information search behavior (ISEQ) and difference in time spent between selected and non-selected measures	54
Table 4-8	Paired sample <i>t</i> test of mean difference between the level of confidence in the strategy and the decision to roll out the strategy	61
Table 4-9	<i>t</i> -test of items sequence (ISEQ) and for each main effect.....	62
Table 4-10	A correlation matrix with means and standard deviations	64
Table 4-11	Paired sample <i>t</i> test of mean difference in duration between time spent on selected measures and time spent on non-selected measures	66
Table 4-12	Logistics regression predicting roll out decision with ISEQ and difference in time spent on selected and non-selected measures as predictors	67

List of Figures

Figure 2-1.	Research Model	11
Figure 2-2.	Operational Model.....	29
Figure 4-1	The main effect of involvement on information search and latency search	56
Figure 4-2	The main effect of DA on information search and latency search.	58
Figure 4-3	The interaction effect between involvement and DA on information search and latency search	59

Executive Summary

Prior BSC research has found that because of the limited capacity of individuals to process information, decision makers simplify their information search behavior. This simplification will eventually create bias and lead to suboptimal decisions. However, we know little about the cognitive process that takes place when individuals search for information in the BSC for purposes of strategy evaluation (Tayler, 2010) or performance evaluation (e.g., Lipe & Salterio, 2000; Libby, Salterio, & Webb, 2004). This current study examines the cognitive process that takes place when individuals use BSC for the purpose of strategy evaluation. Specifically, the purposes of this study are to examine how motivated reasoning affects individuals' information search behavior and decision making in a Balanced Scorecard (BSC) strategy evaluation setting, and to investigate how dissent moderates the effect of directional motivated reasoning on information search behavior.

Motivated reasoning theory suggests that motivation may lead individuals to search out information that supports their beliefs. Therefore, it is reasonable to ask the following questions. If motivation can affect information search behavior, how do individuals search information when they are prone to motivated reasoning? Since individuals are inclined to employ heuristics, what is the difference between motivated and non-motivated individuals when searching information? Furthermore, if motivated reasoning leads to suboptimal decisions, how can we mitigate the bias by manipulating the information search mechanism? This study examines whether motivation to justify a course of action, due to one's own involvement in the initial selection of the strategy, is exhibited in information search behavior. This present study also investigates how information search bias arising from motivated reasoning can be mitigated by applying dissent in the form of a devil's advocate (DA) view.

I predict that individuals who are prone to such motivated reasoning are more likely to search for the information in a directive way, rather than following the sequence in which the information is located or presented. I posit that this directive search is employed by individuals to find information that supports their preferred conclusion and to overlook the information that contradicts this preferred outcome. By directive search is to searching for

specific information within the information that is presented while sequential search refers to a search that follows the sequence in which information is located or presented.

I also investigate how information search bias arising from motivated reasoning can be mitigated by applying dissent in the form of a devil's advocate (DA) view. I predict that when provided with a DA opinion, decision makers are likely to search for information in a sequential manner—following the sequence in which the information is located or presented—in order to get complete information before making a decision. Furthermore, I investigate how individuals' information search behavior affects their decision.

An eye-tracking device was used to record and measure information search behavior. The eye tracker measured participants' visual attention, including eyeball fixation and saccade. *Eyeball fixation* refers to how long a participant's eyes stay focused on a certain area, and *saccade* is the quick movement between eyeball fixations. With this apparatus, I was able not only to detect the information search strategy of individuals, but also to quantify the information search behavior of individuals when they evaluate the BSC.

In a 2 × 2 between-subjects experimental design, wherein the task is to evaluate BSC results, 66 accountants were asked whether they were inclined to roll out the new strategy based on the BSC results. The two between-subjects factors are involvement, with two levels of treatment (no involvement, involvement); and dissent (DA), with two levels of treatment (no DA, DA). The case materials for 34 (about one-half) of the participants indicated that they needed to select one of two strategies to be implemented by the firm. This manipulation was meant to induce involvement among the participants. The case materials for the remaining 32 participants explained that they had received a memo from another manager whose role was that of a DA. This memo contained the DA's opinion regarding the chosen strategic initiative, and questioned the assumptions underlying the decision about the strategy initiative that was chosen. An interaction effect between DA and involvement was also hypothesized.

In this experiment, the case materials presented to the participants indicated that the results of the BSC were inconclusive for strategy evaluation purposes. Although I did not set a threshold for right vs. wrong decisions, if the BSC results were inconclusive then

it is reasonable to assume that, after evaluating all information available, participants would consider the strategy to have been unsuccessful and would therefore decide not to roll out the strategy implementation. Moreover, since individuals are supposed to consider all information comprehensively in order to make a better decision, it is also reasonable to assume that the participants would search the information in the BSC sequentially.

The results showed strong support for the effect of involvement and DA on information search behavior. The results showed that participants who were involved in the initial implementation of the BSC were motivated to search for information in a more directive way, compared to those who were not involved in the implementation. The results are also consistent with the prediction of the role of DA in stimulating better cognitive processes, such that, compared to participants in the non-DA group, those in the DA group will access a wider range of information by employing a sequential search. This is also consistent with the cognitive dissonance prediction—that when holding two contradictory cognitions, individuals are likely to search for performance measures that are consonant with their previous beliefs. The results also explained the link between the presence of cognitive dissonance, dissonance reduction via information search behavior of motivated reasoning, and the decision whether to roll out the new strategy.

Interestingly, I discovered that participants who employed a directive were more likely to make a bias decision that is to rate the new strategy as a success than those who employed a sequential search. While a study by Hunton and McEwen (1997) showed that directive search by experts increase forecast accuracy, this current study suggests a potential weakness of directive search due to motivated reasoning that is it may prevent individuals from searching and exploring all information available which results in bias in making decision. My results suggest the importance of search strategy in this decision-making process. This is an important finding, since previous studies in BSC discounted the idea of attention in the decision-making process. Furthermore, this result shows how DA can change individuals' search strategy and attention, which can in turn lead to a better decision.

Chapter 1.

Introduction

In their book, *Billion Dollar Lessons*, Carroll and Mui (2008) described the reaction of Eastman Kodak's senior managers when they were facing the downfall of their business due to the development of the digital camera. In response to the invention of filmless electronic cameras, Kodak conducted a thorough assessment of their future business in 1981. Kodak's managers "identified all the relevant factors affecting how quickly digital technology would be adopted" (p. 93). However, instead of heeding the substantial changes occurring in the camera industry, they chose to interpret the assessment as a support to "reinforce their strongly held beliefs" (p. 93) about their long-held position of strength in traditional film and instant-print cameras. Unfortunately, their decision to ignore potential red flags about the direction of their business in a changing marketplace led them to enter Chapter 11 bankruptcy in January 2012. The formerly blue-chip stock was then delisted from the New York Stock Exchange.

This illustrative example of information being rejected because it did not fit with the decision makers' preferred outcome is quite consistent with the general view of motivated reasoning presented in this study. When confronted with contrary information, most people tend to actively search for information that supports their preferred conclusion, rather than accepting the information that contradicts this preferred outcome (Kunda, 1990, 1999). Thus, it is clear that motivated reasoning can lead to a bias in information search. As shown in the Kodak example, this type of bias when searching for information can be counterproductive and costly, since individuals prone to such bias tend to overlook possible risks and problems related to their decisions—risks and problems that can lead to catastrophic results. Given the considerable potential cost of suboptimal decision making that arises from bias, it is important to improve our knowledge about information search behavior and types of behavior that can lead to better decisions.

This study examines whether motivation to justify a course of action, due to one's own involvement in the initial selection of the strategy, is exhibited in information search behavior. In general, I investigate several research questions. If motivation can affect information search behavior, how do individuals search information when they are prone to motivated reasoning? Since individuals generally are inclined to employ heuristics, what is the difference between motivated and non-motivated individuals when searching information? Furthermore, if motivated reasoning leads to suboptimal decisions, how can we mitigate the bias by manipulating the information search mechanism? To answer these general questions, I employ an experiment using BSC as a strategy evaluation tool.

Developed by Kaplan and Norton and introduced in 1992, BSC was originally promoted as an integrated, balanced approach that aligns a company's strategy with performance measurement. Under this approach, organizations are measured and managed simultaneously through identification of unique drivers of performance across four key areas: financial, customer service, business processes, and learning and growth. BSC is also intended as a strategic control system that can align departmental and individual goals to the overall firm strategy (Kaplan & Norton, 1996).

Within the accounting field, early behavioral research on the BSC emphasized mitigating the common measures bias, a problem that was first identified by Lipe and Salterio (2000). In a review of the previous studies, Salterio (2012) concluded that BSC studies seemed to prefer to look at environmental factors in the BSC instead of exploring more deeply the relation between human information processing capacities and limitations and the complex structure of the BSC. In particular, previous studies did not clearly explain the underlying psychological factors and human information processes taking place when individuals interpreted and used a multifaceted performance evaluation such as BSC.

A few BSC studies attempted to incorporate psychological factors. Libby et al. (2004) and Tayler (2010) investigated the effect of motivational issues on judgment in using BSC. Libby et al. (2004) identified and tested two approaches to eliminating common measures bias: invoking accountability and providing assurance. They found that accountability increases individuals' motivation to put more weight on unique measures when evaluating subordinate performance. Tayler (2010) showed that individuals'

motivation to exaggerate their preference may create a potential bias in using BSC. He found that managers who were involved in selecting the initiatives and performance measures used motivated reasoning that led them to a suboptimal decision when evaluating strategic initiatives. However, the link between motivation and human information processing that could explain the heuristic process in using BSC is still unclear.

This current study addresses the issue of psychological factors and human information search behavior when using BSC. BSC is of interest in the present study because, with its multiple measures, the BSC gives managers an opportunity to choose the measure that best fits their desired conclusion. Therefore, BSC provides a platform wherein individuals who prefer to arrive at specific conclusions can easily search for information that is consistent with their preferences.

In this study, I investigate the information collection process of directional motivated reasoning, whereby individuals accumulate a reasonable amount of supportive information until the data is sufficient to help them to make a decision. I focus on whether directional motivated reasoning, due to one's own involvement in the initial selection of the strategy, causes individuals to employ directive search (rather than following the sequence in which information is located or presented) and to give greater credence to information that is consistent with their beliefs. This directive search strategy would derive from individuals' motivation to support their conclusion. Therefore, I argue that directive search is not optimal for searching for information and that latency (spending more time) on preferred information will cause individuals to reach a biased decision. Thus, the first objective of this study is to investigate how information search behavior is affected by one's motivation and to examine the effect of information search behavior on individuals' decisions. Specifically, my first research question addresses whether being involved in selecting the strategy and performance measures induces BSC users to acquire and process the BSC in a specific way and whether such behavior affect individuals' decisions.

A motivated information search, in which an individual searches for specific (preferred) information, may lead to a biased decision. Thus, it is plausible to ask a question of how we can mitigate the bias by manipulating the information search

mechanism. Therefore, the second objective of this study is to investigate the role of dissent in moderating the information search of individuals in the motivated reasoning condition. This present study use DA as a form of dissent. DA is of interest in this present study because DA can induce individuals to use all the available information (Nemeth, 1995).

The concept of DA was first introduced in the 1500s, and the traditional role of a DA is to create balance and test the adequacy of the decision-making process by invoking a critique of one's assumptions (Herbert & Estes, 1977). Thus, in response to the dissent of a DA, individuals may be forced to update their information before making a decision. Therefore, my second research question addresses whether the presence of a DA moderates the information acquisition bias resulting from motivated reasoning. I argue that individuals in the DA treatment will be likely to employ sequential search behavior and will evaluate all performance measures available in the BSC, since sequential search supports a thorough information search process, whereas directive search supports a selective information search process.

In this study, I conducted an experiment with a 2 × 2 between-subjects design, manipulating two between-subjects factors: involvement, with two levels of treatment (no involvement and involvement); and DA, with two levels of treatment (no DA and DA). To induce involvement in the involvement treatment, the case materials indicated that participants needed to select one of two strategies to be implemented by the firm. To create DA treatment in the DA group, the case materials explained that the participant received a memo from another manager, whose role is that of a DA. The DA's memo questioned the assumptions underlying the decision about the strategy initiative that had been chosen.

Moreover, the case materials explained that the results of the strategy initiative, based on BSC data, were inconclusive, as only one out of four measures actually showed improvement. This manipulation was expected to cause participants in the involvement group to be prone to motivated reasoning. Although I did not set a threshold for right vs. wrong decisions, if the BSC results were inconclusive then normatively speaking, after evaluating all information available, participants would consider the strategy to have been

unsuccessful and would therefore decide not to roll out the strategy implementation. Moreover, since individuals are supposed to consider all information comprehensively in order to make a better decision, it is also reasonable to assume that the participants would search the information in the BSC sequentially.

An eye-tracking device was used to record and measure participants' information search behavior. With this apparatus, I was able not only to detect the information search strategy of individuals, but also to quantify their information search behavior of individuals when they were evaluating the BSC.

The results show support for the sequential search hypotheses, as the information search behavior of participants with the involvement (dissent) treatment did significantly differ from the information search behavior of participants with the no involvement (no dissent treatment). Participants in the involvement (no involvement) treatment engaged in a more (less) directive search, while those in the dissent (no dissent) treatment employed a more (less) sequential search. For the latency search hypotheses, results show that the time spent on selected measures did not significantly differ between those in the involvement treatment and those in the non-involvement treatment. Interestingly, the time spent on selected measures significantly differed between those in the dissent (DA) and non-DA treatments, which is contrary to my prediction. For the interaction hypotheses, the results also show that a DA's opinion significantly changed individuals' search behavior from primarily directive to more sequential. However, contrary to my prediction that a DA would force subjects to spend equal time on selected and non-selected measures, the dissent of a DA actually drove individuals to review the selected measures carefully. This result suggests that the dissent treatment compels individuals to confirm their beliefs about the selected measures by spending even more time on those measures in order to verify the DA's dissenting opinion. This phenomena is consistent with the notion of belief polarization: when 2 people has similar information but they have opposing opinion between each other, each individual will strengthen their beliefs by evaluating and spent more time on the same information they both have. However, individuals at the same time might also realize that the new strategy implementation was not a success (one measure indicated an improving performance, the overall performance of the stores that adopted the new strategy were not significantly different from the non-adopter stores) particularly

when they sequentially search the information. They had to revise their belief and employ a contrary updating process, a phenomenon where two people update their beliefs in opposite directions after observing the same evidence, which converge their prior belief to the dissent opinion. The positive correlation between the decision to rollout the strategy and the time spent on selected measure confirms that the more time and attention decision-makers spend on unsuccessful measures, the more likely they are to realize that the strategy that was implemented has not worked. This increased latency of search helps participants to decide not to roll out the new strategy.

Finally, the results show support for the correlation between information search behavior and decision. The correlation between sequence of search and the decisions made by individuals is significantly negative. That is, the more directive (sequential) the search, the more (less) likely participants will be to decide that the new strategy should be rolled out. In addition, the time spent on selected or preferred measures is positively correlated well with the decision to implement the strategy. While previous study showed that directive search by more accurate analysts increase forecast accuracy (Hunton and McEwen, 1997), this current study suggests a potential downside of directive search due to motivated reasoning that is it may prevent individuals from searching and exploring all information available which results in bias in making decision.

This study makes contributions to the literature in three ways. First, it contributes to the study of BSC by approaching the use of BSC as a strategy evaluation tool from a human information processing perspective. The eye-tracking apparatus analyzed the direction and the duration of information seeking for each participant in a motivated reasoning condition, as well as the effect of motivated reasoning on judgment and decision in a strategy evaluation setting using BSC. With the use of this special device to examine information search, this study yields further evidence about the information processing of individuals who are prone to motivated reasoning.

Second, the study is the first in the Balanced Scorecard literature to investigate the role of a DA in mitigating bias by manipulating the information search mechanism, and explains how the DA approach affects an individual's cognitive effort. In addition, this study echoes Herbert and Estes (1977), Schwenk (1984) and Kahneman, Lovallo, and Sibony

(2011) conclusion about the importance of the role of a DA's review in business practices. The DA or any dissenting opinion can help executives to bring all possible support and objections to the surface prior to making the decision. By considering all supports and objections raised by the DA, executives will de-emphasize their individuality, especially when they are involved in a strategic business decision. In the presence of a DA, they will not necessarily arrive at the right answers, but it is likely they can produce additional questions to avoid incorrect answers.

Third, this study contributes to the judgment and decision making (JDM) literature by shedding light on the information search process—in particular, the sequence and latency of search, which has important implications for future JDM research.

This study is organized into five sections. Chapter 2 presents the background theory on which the development of all hypotheses are based. Chapter 3 describes the methodology, research design, and experimental procedures employed in the study. Section 4 presents the results of the statistical analyses, including the supplemental analysis. Section 5 discusses the main findings, and limitations, and suggests directions for future research.

Chapter 2.

Literature Review and Hypothesis Development

The purposes of this study are to examine how directional motivated reasoning affects individuals' information search behavior and decision making in a Balanced Scorecard (BSC) strategy evaluation setting, and to investigate how dissent moderates the effect of directional motivated reasoning on information search behavior. This chapter reviews the literature pertaining to the effect of motivated reasoning and dissent on information search. The literature related to motivated reasoning theory will be reviewed in order to develop hypotheses regarding the effects of motivated reasoning on information search. Likewise, the literature related to dissent will be reviewed to develop hypothesis regarding the effect of dissent on information search. First, to provide a better understanding of the context of this study, an overview of BSC studies will be presented.

2.1. Balanced Scorecard

Kaplan and Norton (1992, 1993, 1996a, 1996b) defined BSC as a set of causally linked non-financial and financial objectives and performance measures designed to align managers' actions with an organization's strategy. BSC assesses the financial and non-financial outcomes of a firm through identification of unique drivers of performance across four key areas: financial, customer service, business processes, and learning and growth. BSC further links together the cause-and-effect relationships of the drivers that allow for predictability of future financial measures, based on non-financial measures. BSC is also intended as a strategic control system that can align departmental and individual goals to the firm's overall strategy (Kaplan & Norton, 1996).

A BSC is more than just a collection of measures. It comprises a set of measures, which are translated from the firm's strategy, that are linked to each other and to the firm's strategy. When evaluating a complex structure such as a BSC, individuals may fall into psychological traps as they apply heuristics (which are unconscious routines based on past experiences) and other mental shortcuts to manage complex information before

arriving at a decision (Hammond, Keeney, & Raiffa, 1998). This use of heuristics is fraught with errors in judgment that result from cognitive bias (Kahneman et al., 2011).

A cognitive bias that was first identified by Lipe and Salterio (2000) in using BSC was common measure bias. Lipe and Salterio found that decision makers' evaluations on BSC are systematically influenced by the common measures and not affected by the unique measures. Following Lipe and Salterio's study, a large number of behavioral studies that used BSC as the setting explored how to mitigate common measure bias. Those studies showed that common measure bias would be reduced by aggregating BSC format (Roberts, Albright, & Hibbets, 2004), by providing training (Dilla & Steinbart, 2005), by providing a strategy map (Banker, Chang, & Pizzini, 2004), or by putting some positive weight on the unique measures (Roberts et al., 2004). Taken together, BSC studies prefer to look at environmental factors in the BSC in mitigating common measure bias.

Salterio (2012) pointed out that BSC format and content are based to a large extent on psychology research. Salterio argued that placing greater weight on the environmental factors of BSC to mitigate common measure bias would downplay Kaplan and Norton's robust findings regarding the design of BSC that comes from psychology research (Salterio, 2012). In particular, previous studies did not clearly explain the underlying psychological factors and human information processes taking place when individuals interpreted and used a multifaceted performance evaluation such as BSC. Salterio highlighted the importance of taking a human information processing perspective in BSC research, in order to explain how and why people make suboptimal decisions when using BSC. In his review, he pointed to the work of Libby et al. (2004) and Tayler (2010), which showed the effect of motivational issues on judgment in using BSC. Libby et al. (2004) identified and tested two approaches to eliminating common measure bias: invoking accountability and providing assurance. Libby et al. suggested that accountability increases individuals' motivation to put more weight on unique measures when evaluating subordinate performance. Tayler (2010) showed that motivation to exaggerate one's own preference may create a potential bias in using BSC. He found that when managers evaluated strategic initiatives, those who had been involved in selecting the initiatives and performance measures encountered motivated reasoning that led them to a suboptimal decision. However, Tayler's and Libby et al.'s studies did not discuss in depth the link

between motivation and human information processing that could explain the heuristic process in using BSC.

The assumption of motivated reasoning is that people are driven by their beliefs in obtaining information, in order to support their preferred conclusion. Therefore, it is reasonable to ask the following questions. If motivation can affect information search behavior, how do individuals search information in BSC when they are prone to motivated reasoning? Since individuals are inclined to employ heuristics, what is the difference between motivated and non-motivated individuals when searching information in BSC? Furthermore, if motivated reasoning leads to suboptimal decisions, how can we mitigate the bias by manipulating the information search mechanism? This current study addresses the issue of psychological factors and human information search behavior when using BSC.

Figure 2.1 shows a model for investigating these research questions. According to the model, motivated reasoning will influence individual behavior in searching information, such that individuals will search for and pay more attention to information that is consistent with their goal and their desired conclusion. In addition, since people are drawn to their preferred information, their decision will be biased by the information they select and pay attention to. The model also predicts that the dissent will affect information search behavior, such that individuals will increase their cognitive effort in searching for information. Furthermore, dissent will mitigate the effect of motivated reasoning in searching for information, such that individuals who initially follow or adopt motivated reasoning will self-redirect and pay evenly balanced attention to all available information.

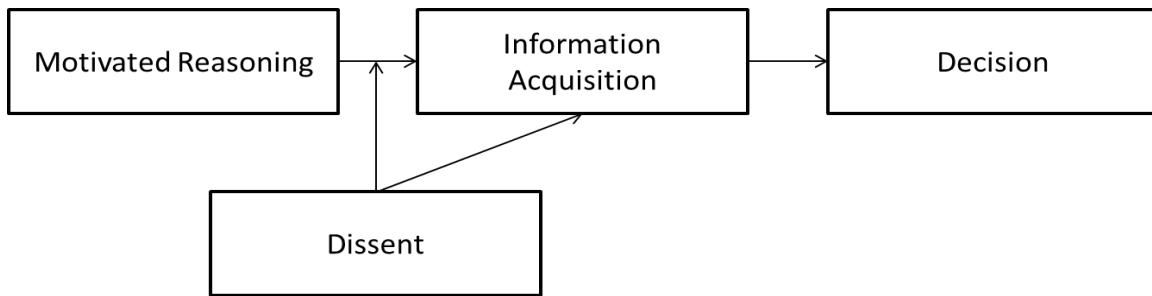


Figure 2-1. Research Model

2.2. Motivated Reasoning

Motivation is an intermediate state that can be induced by external factors such as monetary concerns, feedback, accountability, time pressure, and standards and regulations, as well as by goals. Internal factors or intrinsic motivational factors such as individual needs and drives also affect motivation. This study focuses on internal motivations, that is, motives that individuals bring to a task while performing it (Bonner, 2008). In particular, this study examines the process of internal motivation in judgment and the decision-making process.

Kunda (1990) proposed two different effects of motivation on information processing, based on whether the motivation is to reach a particular conclusion (directional goal) or to be accurate (accuracy goal). Motivation to reach a particular conclusion, or *directional motivated reasoning*, occurs when people are driven by their beliefs in obtaining and processing information in order to support their preferred conclusion. On the other hand, *accuracy-driven reasoning* means that people who are asked to be accurate will utilize more cognitive effort by attending to relevant information, processing the information more seriously, and developing a complex information search.

Both types of motivated reasoning can be present in an accounting setting. For example, accountants are motivated to reach a particular goal (directional motivated reasoning) when they have the goal of accepting a client’s accounting method, and they are motivated to be accurate when they have to be accountable to their superiors. In a performance evaluation setting, a subordinate is motivated to reach a superior’s goals when such goals are clearly established, and is motivated to be accurate when asked to

present and explain his or her work or judgment. In this study, I focus on directional motivated reasoning, or the motivation to reach a particular goal or conclusion.

Kunda (1990) posited that motivated reasoning may increase or decrease cognitive effort related to the performed task. (Bonner, 2008) explained that cognitive effort is composed of effort direction, effort duration, and effort intensity. An increase in *effort direction* relates to the likelihood of engaging in a particular activity. An increase in *effort duration* pertains to the length of time spent on a task. An increase in *effort intensity* relates to the level of attention a person gives to a task in a fixed period of time

Kunda (1990) proposed that those who are motivated to arrive at a particular conclusion (directional motivated reasoning) tend to decrease or to increase their cognitive effort in order to construct a justification of their desired conclusion. They search for information that could support their desired conclusion, and creatively combine accessed information to construct new beliefs that could logically support the desired goal. Increases or decreases in cognitive effort depend on the availability of evidence to support the decision. If sufficient evidence is easily accessible, then cognitive effort is usually small, as the person can easily construct a sufficient rationale for the decision. However, if sufficient evidence to support the decision does not emerge or is difficult to find, then cognitive effort may be greater than it would be without directional motivation. Thus, to justify overlooking the contrary evidence, directional reasoners will gather more information that supports their beliefs (Kunda, 1990, 1999; Redlawsk, Civettini, & Emmerson, 2010).

The propensity to pay more attention to information that fits with one's beliefs, rather than information that might challenge them, is also known as *confirmation bias*. Jonas, Schulz-Hardt, Frey, and Thelen (2001) defined confirmation bias as "requesting information that supports a pre-selected alternative, thus the decision maker using this strategy knows that he or she will get the confirmation sought." According to Marcus (2008, p. 56), motivated reasoning is "a kind of flip side to confirmation bias. Whereas confirmation bias is an automatic tendency to notice data that fit with our beliefs, motivated reasoning is the complementary tendency to scrutinize ideas more carefully if we don't like them than if we do." The present study does not attempt to differentiate between

confirmation bias and motivated reasoning, as each points to the same implication, namely that individuals will search for information that fits with their preferred conclusion.

Prior accounting research has demonstrated the effect of directional motivated reasoning on judgments. For example, Kadous, Kennedy, and Peecher (2003) provided evidence that directional motivated reasoning creates a tendency among auditors to accept the client-preferred accounting method, even when the method is aggressive and there are better accounting methods available. In addition, Kadous, Magro, and Spilker (2008) showed that tax professionals' evaluations of evidence and information search are driven by their clients' preferred conclusions.

These findings in accounting research regarding the relationship between directional motivated reasoning, judgment, and decision making reflect findings in psychology as well. Directional motivated reasoning studies in the psychology field show that individuals with a preferred conclusion will examine information consistently less critically when that information is consistent with the preferred conclusion. Individuals also require less information to reach a preferred conclusion than a non-preferred conclusion (Ditto & Lopez, 1992; Jain & Maheswaran, 2000).

Some psychology researchers have argued that selective attention due to motivated reasoning is an internal mechanism to mitigate *cognitive dissonance* (Kunda, 1990). Festinger (1957) proposed that two contradictory cognitions that are held simultaneously can cause an unpleasant state of cognitive dissonance, and the person will strive to reduce the dissonance by changing one or more of the relevant cognitions. The cognitions "I believe X" and "I have seen not X" seem dissonant, and to reduce this dissonance, individuals change their beliefs to bring them into correspondence with their actions. Thus, rather than search for information in a rational way to either confirm or disconfirm a particular belief, people actually search for information that confirms their prior beliefs in order to reduce the inconsistency. According to cognitive dissonance theory, this selective attention effort plays a central role as a prime mechanism for dissonance reduction (Festinger, 1957).

Prior accounting research has shown the effect of cognitive dissonance on accounting decisions. Tiller (1983) predicted and found that increasing commitment to

achieve a budget goal is a mechanism to reduce cognitive dissonance. Under participative budgeting, people are more likely to increase their commitment to achieving the budget when they select a more difficult budget goal compared to when they select a less difficult budget goal. Building on the theory of cognitive dissonance, Jermias (2001) predicted that inertia with regard to applying a new costing system is due to commitment to another course of action. In a laboratory experiment, he found that people's judgments about the usefulness of costing systems were influenced by their commitment to their favored system. To rationalize their judgment, participants assessed only a subset of their knowledge to support their desired conclusion. Thayer (2011), in a field experiment, examined analysts' choice of information source when confirming their investment position. Thayer found that cognitive dissonance caused people to search for information that supported the likely profitability of a chosen investment decision. She argued that receipt of unfavorable information should arouse dissonance in individuals, which in turn will lead them to reduce the dissonance by seeking additional information to justify their beliefs. Thayer's results also showed that people were likely to accept less credible information in order to gather support for their prior belief. Accordingly, the analysts' information acquisition methods influenced their earnings expectations. These studies confirmed Festinger's (1957) prediction that the presence of dissonance leads individuals to take action to reduce the dissonance.

In the context of BSC as a strategy evaluation tool, the cognitive dissonance phenomenon appears when the results of the BSC for the implementation of a new strategy are unconvincing (Tayler, 2010). This is because individuals who are involved in the strategy selection process hold two conflicting cognitions: they believe the strategy is good, but the results show the opposite. Tayler (2010) predicted that when decision makers are confronted with cognitive dissonance, they will rationalize their decision that the strategy they choose is successful, because of their involvement in the strategy evaluation process. Although Tayler did not specifically discuss the relation between cognitive dissonance and motivated reasoning, his results indicated that motivated reasoning can reduce cognitive dissonance.

While these studies explained the link between cognitive dissonance theory and the study of motivated reasoning in terms of a selective information process to reduce

dissonance, they did not test how individuals seek the information used to justify their decision. Thus, it is not clear how individuals increase or decrease their mental effort when they are motivated to reach a particular conclusion.

2.3. Information Search Behavior

Bonner (2008) classified the cognitive process into five steps: memory retrieval, information search, problem representation, hypothesis generation, and hypothesis evaluation. An individual starts a judgment and decision making (JDM) task by retrieving, from his or her memory, information that is related to the task, and then searching for information in external sources. Then he or she constructs a mental interpretation that reflects his or her understanding of the task, followed by hypothesis generation to predict possible explanations and outcomes from the information cues. Finally, the individual evaluates the hypotheses and chooses the most plausible one as the favored explanation and the final judgment. The current study focuses on information search as an important construct in models of the cognitive process. Since information search is assumed to inform the “what” and “how” of decision making in accounting (Riahi-Belkaoui, 1989), understanding the information search process is critical to decision making research. Furthermore, the quality of the decision will be heavily affected by how well an individual searches for information; a decision maker who performs poorly in searching for information is likely to make a suboptimal decision (Bonner, 2008). Nonetheless, little is known about why individuals observe different types of information or how that information influences or is influenced by other decision-making process constructs. This study investigates the information search process in order to help explain how individuals collect and use information in making their decisions.

Ford, Schmitt, Schechtman, Hults, and Doherty (1989) identified four dimensions of information search: depth of search, sequence of search, content of search, and latency of search. *Depth of search* refers to the total information searched or the amount of information searched. The *sequence of search* can be either sequential or directive: a *sequential search* follows the sequence in which information is located or presented, while a *directive search* concentrates on specific information. *Content of search* relates to the level of relevance an individual places on the information, while *latency of search* refers

to time spent per item or the total time that an individual spends to search all items. This study will focus on sequence of search and latency of information search.

The vast majority of studies in the field of information search behavior in accounting have concentrated on factors that moderate the effect of information search on the quality of the judgment and decision. Early studies on information search in management accounting investigated the moderating effect of information complexity on levels of human information processing (San Miguel, 1976), how initial attributions made by a superior or a subordinate influence information seeking (Harrison, West, & Reneau, 1988), and the moderating effect of information overload on information processing behavior (Swain & Haka, 2000). Research in other accounting fields, such as financial accounting and auditing, have examined the information-seeking behavior of analysts (Biggs, 1984; Bouwman, Frishkoff, & Frishkoff, 1987; Hunton & McEwen, 1997; Jacoby, Kuss, Mazursky, & Troutman, 1985), investors (Abdel-Khalik & El-Sheshai, 1980; Ackert, Church, & Shehata, 1996), and auditors (Biggs & Mock, 1983; Rosman, Seol, & Biggs, 1999).

According to Bonner (2008), judgment and decision quality are affected by three variables: person, task, and environment. *Person variables* relate to characteristics of the individual (e.g., knowledge, ability). *Task variables* relate to the dimensions of the task (e.g., task complexity). *Environmental variables* relate to circumstances around the individual while making a decision (e.g., motivated reasoning). Regarding the effect of person variables on information search, Hunton and McEwen's (1997) study of the use of accounting information showed that different individuals have different strategic abilities (cognitive complexity) when it comes to organizing information, and that they also tend to employ different information search strategies. Hunton and McEwen investigated the difference in information search behavior between more-accurate analysts and less-accurate analysts. They found that more-accurate analysts are more likely to employ directive information search (i.e., they select specific information from the given set of information), while less-accurate analysts are more likely to employ sequential search strategy (i.e., they select the next informational item in sequential order). They also found that analyst accuracy is related to a more directive information search, as opposed to a sequential information search strategy. Although their study shows that directive

information search is associated with forecast accuracy, this current study suggests a potential disadvantage of directive information search. This directive search strategy would derive from individuals' motivation to support their conclusion and as motivated reasoning predicts that directive information search might prevent individuals for searching and exploring all information available which results in bias in making decision. Therefore, I argue that directive search is not optimal for searching for information.

In relation to task complexity, the information search process is affected by an individual's limited ability to process information due to limited short-term memory. Thus, people prefer to limit their information search and to rely more on memory (Simon, 1990), particularly when the complexity of the task increases (Payne, 1976).

The aforementioned studies appear to focus on person and task factors that affect the information search. Thus, little is known about how environmental variables such as motivation influence information search behavior, a gap in our understanding that this study aims to remedy.

With regard to environmental variables, McEwen and Hunton (1999) posited that more-accurate analysts and less-accurate analysts would search for different items. In their experiment, McEwan and Hunton summarized the specific information items accessed by each participant, studied the sequence number of each item used by participants, and measured the time participants spent analyzing each item. They found that there was a significant difference in content search between more-accurate analysts and less-accurate analysts. More-accurate analysts tended to access information such as key ratios, earnings summaries, and previous income, and tended to ignore certain disclosures, whereas less-accurate analysts tended to emphasize Balance Sheet items and the footnotes. In addition, Biggs (1984) employed verbal protocol analysis to investigate the information search behavior of financial analysts involved in assessing the earning power of five companies. He found that analysts employed directed search strategy when evaluating the companies' future earning power.

In this current study, I investigate the effect of motivation on individuals performing an information search. In particular, special attention will be paid to investigating the

sequence and latency of search by individuals who are motivated to reach a particular goal.

2.4. Sequence and Latency of Information Search

The existing literature has examined the effect of moderating factors upon information search. Few studies, however, have examined how motivational forces influence individuals' information search process. According to a parsimonious model of information search proposed by Schmidt and Spreng (1996), motivation is one of four antecedents of information search (the other three being ability, costs, and benefits). Thus, individuals make judgments partly based on strong motivation to reach a particular conclusion or to satisfy the motivation to be accurate.

Building on the argument that motivated reasoning will increase the tendency of managers to evaluate and interpret data that is consistent with their preferences, Tayler (2010) investigated the effect of managers' involvement in the selection of strategic initiatives and performance measures upon those same managers' decisions. In a setting in which participants were assigned the role of managers who used BSC to evaluate a new strategic initiative, Tayler randomly assigned 135 MBA students to a 2 × 3 experimental design. He then crossed two levels of scorecard framing (BSC in a simple four groups format and BSC shown as a causal chain) with three levels of scorecard implementation initiatives (no involvement, initiative selection involvement, and both initiative and measures selection involvement). Tayler expected to find that managers who were involved in the selection of initiatives would consider rolling out an initiative firm wide. This hypothesis was based on directional motivated reasoning, which suggests that managers who are involved in the selection of an initiative are motivated to recognize their initiative as effective, and likewise, that managers who are involved in selecting performance measures are motivated to regard their measures as good measures for performance evaluation. Participants were asked to rate how likely they would be to recommend rolling out the initiative they chose to the remainder of the firm's branches on a scale of 1 (very unlikely to recommend) to 7 (very likely to recommend). The results showed that participants who were involved in selecting the initiative gave a higher rate of recommendation to roll out the initiative than did participants not involved in the selection.

Taylor also found that framing the scorecard as a causal chain and involving managers in performance measure and initiative selection mitigated the effects of motivated reasoning related to the managers' involvement in initiative selection. However, he found that simply framing the BSC as a causal chain did not significantly mitigate motivated reasoning processes.

Taylor's (2010) study showed that involvement in the selection process of the BSC strategy and performance measures increases one's commitment and confidence in the success of the strategy implementation. When confronted with objectionable results or conflicting beliefs, individuals will reduce their dissonance by selecting information that is consistent with their preferred strategy, which will lead them to a biased decision (Festinger, 1957; Jermias, 2001; Kunda, 1990; Thayer, 2011). Taylor attributed this bias to the cognitive effort of individuals who consider their selected strategy and performance measures to be good for the firm. He suggested, but did not test, that individuals are motivated to increase their cognitive effort to reason more about their preferred measures and strategies, even when there is some evidence to discourage those preferences. He did not test the information collection process of directional motivated reasoning, whereby individuals will keep accumulating a reasonable amount of supportive information up to the point that the accumulated data is sufficient to help them to make a decision. Thus, Taylor's study did not clearly explain the information search mechanism of directional motivated reasoning, which could provide insight into how individuals evaluate and interpret data consistent with their preferences.

The directional motivated reasoning argument suggests that in order to support their desired conclusion, people are driven by their beliefs when obtaining and processing information. Although motivated reasoning theory does not explicitly suggest it, it is plausible to assume that in searching for and processing information, directional reasoners will engage in a directive search for information that is consistent with their goals. They are less likely to spend time looking for information that is not consistent with their preference; rather, they will search quickly and spend the time looking for their preferred information.

This current study attempts to test directly the effect of directional motivated reasoning theory in individual information search behavior. To achieve this purpose, an eye-tracking device was used to closely record and examine how individuals collect and search for information, as well as how they employ information search strategy in their decision-making processes. For this experiment, I modified Tayler's (2010) experimental materials and setting. I made important changes from the original setting that permitted me to assess the sequence of information search as well as the latency of search. The first change was to the strategy and performance measures selection process. In Tayler's study, all subjects were asked to choose one strategy initiative and one measure in the customer perspective in the BSC. In my experiment, subjects were asked to choose one strategy initiative out of two possible initiatives, where each comes with a set of measures associated with that particular strategy initiative. The second change was in the structure of the BSC. In Tayler's study, the BSC only had one measure for each perspective; in my experiment, the BSC has two measures for each perspective: one measure is associated or linked to the strategy initiative and the other measure is not associated or not linked to the strategy initiative. This BSC modification provides more cues of attention on information available in the BSC, in order to analyze information search behavior.

Based on the previous discussion, it is clear that individuals tend to search for information that favors their beliefs and desired outcome. If individuals are to assess all performance measures *without bias toward a certain goal*, they will compare the actual result with the target results for all measures in a sequential order (following the sequence in which information is located or presented). Thus, they will capture the cues of each performance measure in accordance with their prior beliefs for certain measures and/or their cognitive capacity to process a large set of measures. In the absence of a specific goal when evaluating performance, it is likely that they will use the information they captured, based on prior beliefs or cognitive ability, for their decision.

In this current experimental setting, I predict that participants who are involved in the process of selecting a strategy and its associated performance measures will be able to identify the relevant measures related to the firm's strategy. In particular, when the results of BSC for strategy evaluation purposes show unconvincing performance of the strategy selected, participants in the involvement group will be prone to motivated

reasoning, since the results of the BSC are inconsistent with their prior beliefs and preferred conclusion. I also expect to find that participants are motivated to regard their strategy and measures as good strategy and measures. Thus, I predict that there will be bias in individuals' decision-making processes when using information they favor, since they employ directive search when searching for information. Because of their inclusion in the selection process of the performance measures, and the unconvincing results of the selected strategy, I predict that cues about the importance of selected measures will be activated, and I predict that participants will directly search and pay attention to their chosen strategy's associated preferred measures. As such, when the result of the performance measures is presented, participants will directly identify their preferred performance measures and directly pay more attention to those measures. Thus, when participants are involved in the selection of performance measures, they will first compare the result with the target results of the performance measures they favor.

In sum, I predict that directional reasoners will employ more directive search when comparing the result with the target results of their preferred measures. Therefore, I propose the following hypothesis, stated in alternative form:

H1: Individuals in the involvement group are more directive in searching for information than individuals in the no involvement group. (The correlation between the order of items appearing in BSC and the sequence of items seen by individuals is lower in the involvement group than in the no involvement group.)

To measure the information search strategy, I follow Hunton and McEwen's (1997) methodology to determine sequential and directive search strategy. In brief, a high (low) correlation between the sequence of information presented and the sequence of information accessed indicates a sequential (directive) search. I discuss this methodology in detail in Chapter 3 of this paper.

Information search is a critical step in assessing and determining complex issues in many different decision-making processes. Empirical studies on biased information search in decision making have shown that people prefer information that supports their prior beliefs, expectations, or conclusions (Jonas et al., 2001). According to Kunda (1990), individuals will search for information that supports their desired conclusion. They will

increase or decrease their cognitive effort based on the evidence available to support the decision. Furthermore, as individuals directly search for information that is consistent with their goal, directional reasoners will give more weight to information that is consistent with their beliefs, and less weight to information that is inconsistent with their beliefs. Therefore, when individuals seek information, they will spend more time on information (i.e. selected performance measures) that favors their own previously held beliefs, expectations, or desired conclusions.

H2: Individuals in the involvement group are more likely to spend more time on selected performance measures than on non-selected performance measures, whereas individuals in the no involvement group will spend equal time on both the company's selected and non-selected measures. (The difference in time spent on selected vs. non-selected measures will be greater in the involvement group than in the no involvement group.)

2.5. Dissent (Devil's Advocate (DA))

Decision making is not an event; it is a process for which one should seek support from all levels of the organization in order to reduce cognitive bias (Garvin & Roberto, 2001; Kahneman, 2011), and this support should include dissenting opinions (Kahneman et al., 2011). The dissent can involve criticism and disagreement that challenge the managers' opinions or decisions. According to Merriam-Webster, *dissent* is "public disagreement with an official opinion, decision, or set of beliefs" (<http://www.merriam-webster.com/dictionary/dissent>). The present study examines the role of devil's advocate (DA) as a form of dissent (Cosier, 1978). The idea of the DA was first introduced by the Roman Catholic Church in the 1500s, as part of the sanctification. A promoter of the faith was asked not only to examine the life of the potential saint and the miracles attributed to him or her, but also to play the role of DA, presenting all known facts that were unfavorable to the candidate (Herbert & Estes, 1977). This DA practice was meant to help the Church guard against inaccuracy in this crucially important decision-making process (Carroll & Mui, 2008).

DA is intended purposely to balance and test the adequacy of a decision-making process. It is a theoretical method of formalized dissent that is examined within social

judgment theory (SJT; Cosier, 1978). SJT, which was derived within the field of social psychology, focuses on the internal processes of an individual's judgment with relation to new information (Sherif & Hovland, 1961). In the social psychology literature, DA involves criticism of a proposal or of a stated position, and the DA is obligated to find everything that is wrong with the plan or position (Schwenk, 1990). Specifically, the role of a DA is to investigate a proposal made by another person, to point out the bias and problems of the proposal, to prepare a list of what is wrong with the proposal, to explain why it should not be adopted, and to provide alternative proposals (Cosier, 1978; Herbert & Estes, 1977).

In *The Essence of Strategic Decision Making*, Schwenk (1988) reported that numerous studies support the effectiveness of a DA in improving organizational decision making. The increasing trend toward using DA is due to the fact that it improves the analysis of data, understanding of a problem, and quality of solutions. In particular, DA increases the quality of assumptions and the number of strategic alternatives, and it works effectively when one is faced with tackling complex and ill-structured problems. A classic example of the use of DA is the role of Robert Kennedy and Theodore Sorenson during the Cuban Missile Crisis. They played the role of DA by critically examining the actions suggested by President John F. Kennedy's advisory staff. In this example, the role of DA improved the quality of the administration's decision making, which helped the U.S. government to choose an effective response to the placement of Soviet missiles in Cuba.

Another example of the application of DA in decision making, this time in a business situation, is provided by Tom Watson, Jr., of IBM, who promoted the role of DA as part of a system of checks and balances. Watson authorized his managers to make their decisions with the stipulation that staff experts could challenge their decisions and demonstrate their disagreement. This application of DA eventually increased the quality of decisions made by the managers at IBM (Carroll & Mui, 2008). Still another example of formal dissent via DA is seen in the role of internal auditors, who provide a check on investment decisions or other proposals to ensure that all relevant information has been considered before executing the proposal (Herbert & Estes, 1977).

Schwenk (1988a) examined the role of DA in mitigating the bias from escalating commitment. Schwenk stated that escalating commitment may occur when individuals

evaluating a failing project receive an expert's statement in support of the project. He argued that DA reduces the tendency toward escalating commitment caused by expert support, by bringing up conflicting views for managers to consider before making decisions. In a laboratory experiment, 112 undergraduate students each played the role of a corporate financial officer whose job was to allocate \$20 million of research and development funds to one of two divisions: consumer products or industrial products. Schwenk randomly assigned the subjects to four different groups of treatments: a group who received success feedback only (success treatment), a group who received failure feedback only (failure treatment), a group who received failure feedback with expert support (failure with expert treatment), and a group who received failure feedback with expert support and a DA report (failure with DA treatment). The DA treatment was introduced to the subjects by giving them a report of the failure of the project and another report from "a second committee" that provided a critique questioning the underlying assumptions of the project. The results of Schwenk's study supported previous studies suggesting that DA reduces overconfidence that results from escalating commitment.

The general notion regarding the effects of DA on individuals' decisions is that this form of dissent stimulates better cognitive processes, such that individuals will access a wider range of information and consider the information from different perspectives (Nemeth, 1995; Nemeth & Rogers, 1996). DA will also stimulate the re-examination of positions and a more thorough consideration of alternatives, and will culminate in more and better solutions (Nemeth, Brown, & Rogers, 2001; Stanley, 1981).

Nemeth (1995) provided a rational explanation for why individuals seek out additional information in the presence of DA. Since people like to be accurate in their decisions, they are open to conflicting information if they believe that processing it will result in acquiring useful information. The reason behind this behavior is that individuals expect agreement from others; when they face preference-inconsistent information, they are motivated to search more information and exert a greater cognitive effort in order to align their position more closely with that of others. This behavior is consistent with social judgment theory as proposed by Sherif and Hovland (1961), who proposed that an individual weighs every new idea, comparing it with his or her present point of view to determine his or her attitude toward the new idea.

A study by Nemeth and Rogers (1996) showed that individuals who are exposed to minority dissent or to a DA engage in divergent thought processes, search more information before making a decision, consider more alternatives, and make relatively less biased decisions. Conversely, individuals who are exposed to majority dissent tend to search for information that is consistent with the majority view and show more biased information processing. By minority dissent is opposing argument or opinion that comes from an individual while majority dissent is mass message or opinion that comes from a large group of people.

The results of these studies suggest that DA will help individuals to evaluate all available information and challenge their previous beliefs or preferred conclusions. Therefore, I argue that participants in the DA treatment will be likely to employ sequential search behavior and will likewise evaluate all performance measures available in BSC, since sequential search supports a thorough information search process, whereas directive search supports a selective information search process. However, since I cannot predict the magnitude or the degree of the sequence of information search, I only predict that compared to those who do not have the DA treatment, participants who have the DA treatment will have a higher coefficient correlation between the orders of items appearing in BSC and the order of items seen by them. Therefore, I propose the following hypothesis on the relationship between DA and information search strategy in alternative form:

H3: The correlation between the order of items appearing in BSC and order of items seen by individuals will be higher in the DA group than in the no DA group. (Individuals in the DA [no DA] group will be more [less] sequential in searching for information).

In addition, as participants sequentially search the information, I predict that they will evaluate all performance measures equally and will be less likely to spend time only on particular measures (i.e., selected or non-selected measures), or that they will be less likely to employ a selective information search. Therefore, I propose the following hypothesis in alternative form:

H4: Individuals in the DA (no DA) group will spend time equally (unequally) on both selected performance measures and non-selected performance measures. (The

difference in time spent on selected vs. non-selected measures will be smaller in the DA group than in the no DA group.)

2.6. Moderating Effect of Devil's Advocate on Directional Motivated Reasoning

Individuals often systematically prefer information that is favorable or compatible with their prior beliefs or expected conclusions. They are motivated to seek information that is consistent with their goal, and their effort in searching the information is affected by their desired conclusion. However, as discussed earlier, DA can also affect individuals' information search behavior.

Since individuals have limited capacity for searching and processing information, once they have collected all the information needed to support their decision, they will stop searching for information and start developing their hypotheses; they will then evaluate the hypotheses and choose the most plausible one as the favored explanation and the final judgment. Thus, concerning the moderating effect of DA on motivation and information search, I argue that the effects of DA on directional motivated reasoning take two different paths. First, if individuals start with a directive information strategy (only collecting their preferred information), DA will cause them to change their search strategy toward sequential search (collecting all information) in order to maximize their utility in searching and collecting information. Second, if individuals have sequentially searched the information, DA will not significantly change their information search; they will still search the information sequentially, and once they have collected all the information available, they will stop searching. Thus, for individuals in the involvement group, DA will cause greater changes the information search (i.e., from directive to sequential), whereas for individuals in the no involvement group, DA will have less impact on the information search (i.e., sequential search will remain sequential). Therefore, I propose the following hypothesis in alternative form:

H5: DA will moderate the relationship between involvement and information search, such that DA will cause the correlation between the order of items appearing in BSC and the

sequence of items seen by individuals to be higher in the involvement/DA group than that of individuals in the involvement/no DA group.

The previous discussion suggested that DA changes individuals' cognitive effort, with the effect on information search being stronger in the involvement group than in the no involvement group. As individuals sequentially search the information in the BSC, they will evaluate all performance measures equally, and the difference in time spent on selected and non-selected measures will be insignificant. Therefore, I propose the following hypothesis in alternative form:

H6: The relationship between involvement and time spent in searching for information will be moderated by DA, such that DA will cause the difference in time spent on selected vs. non-selected measures to be smaller among individuals in the DA group than in the no DA group.

2.7. Information Search and Decision

The above hypotheses relate to the consequences of how a decision maker organizes information where there is preference-consistent or preference-inconsistent information. Equally important in this study is the effect of such information search behavior on judgment and decision.

Within the motivated judgment literature, the empirical findings show a robust tendency among individuals to process information that is consistent with a preferred conclusion (preference-consistent information) with less effort than information that is inconsistent with the preferred conclusion (preference-inconsistent information). In general, individuals tend to evaluate preference-consistent information less critically than preference-inconsistent information (Ditto & Lopez, 1992; Hales, 2007; Jain & Maheswaran, 2000). Jain and Maheswaran (2000) also documented that when individuals have strongly held preferences, they may engage in biased processing. Specifically, preference-inconsistent information was processed in greater depth and counter-argued more than preference-consistent information. In this current study, participants are

exposed to preference-inconsistent information; they are informed that the selected strategy does not show a causal relation to overall firm performance.

Following the discussions in support of the first two hypotheses, it is further expected that individuals who are involved in selecting the strategy and its associated performance measures will be motivated to regard their chosen strategy and measures as good strategy and measures. Since directive search strategy is derived from motivation to support their conclusion, I predict that there will be bias in individuals' decision when they employ directive search. In particular, if individuals are involved in the selection of performance measures, they will employ directive search as they first directly compare the result with the target results of the strategy and performance measures they preferred. Because they spend more time on those preferred measures and collect all information that supports their beliefs and desired conclusions, they are more likely to recommend the implementation of their chosen strategy than individuals who are not involved in the selection process.

Thus, I examine whether there is a correlation between individuals' information search behavior and their decisions related to implementing or not implementing a questionable strategy initiative. I also examine whether directive search and latency on preferred information will cause individuals to reach a biased decision, that is, to roll out the selected strategy. I predict that there is a positive correlation between information search behavior and individuals' decision, such that a directive search behavior is associated with the biased decision to roll out the implementation of strategy initiatives. In addition, I also predict that increased time spent on the preferred performance measures will be associated with the decision to roll out the implementation of strategy initiatives. Therefore, I propose the following hypotheses stated in alternative form:

H7: There will be a positive correlation between directive search strategy and the decision to roll out the implementation of the strategy initiative.

H8: There will be a positive correlation between the time spent on preferred performance measures and the decision to roll out the implementation of the strategy initiative.

In summary, Figure 2 shows the relationship between the variables in the operational level of the model and all hypotheses that will be tested in this study. Involvement represents directional motivated reasoning, an independent variable equal to 1 for involvement in the strategy and the performance measures selection process, and 0 otherwise. Information search behavior is represented by the sequence of search: sequential or directive search. *Sequential search* refers to a search that follows the sequence in which information is located or presented, whereas *directive search* refers to searching for specific information within the information that is presented. Information search behavior is also characterized by the *latency of search* (the duration or time spent on particular information). The DA (devil’s advocate) represents dissent, and is equal to 1 for DA and 0 for no DA. Finally, measured in an interval scale, the roll out judgment represents individuals’ decision outcomes, ranging from “very unlikely” to “very likely” to roll out the strategy initiative and implementation of performance measures.

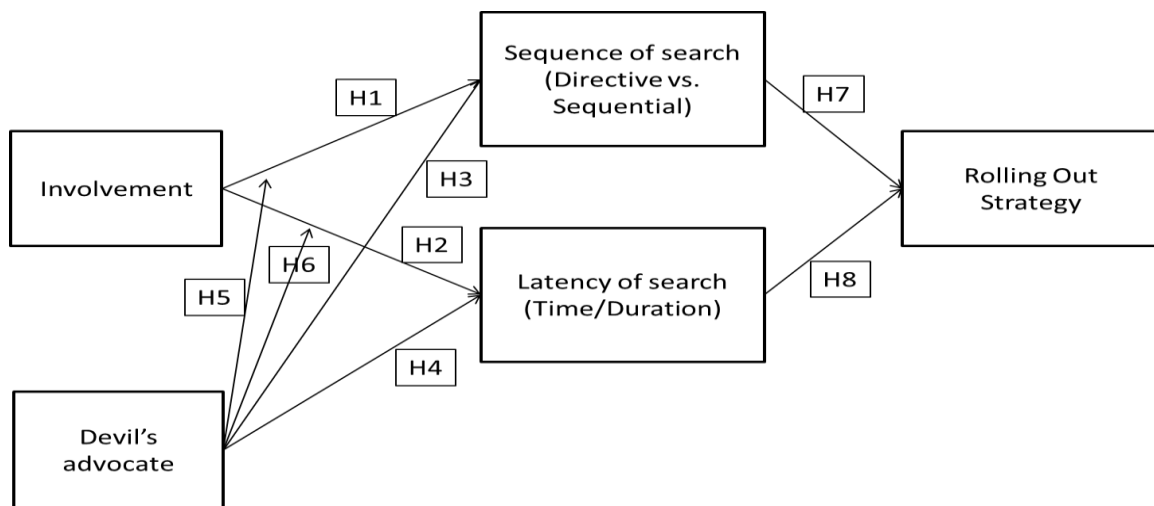


Figure 2-2. Operational Model

Chapter 3.

Methodology

3.1. Overview

In an experimental task involving the use of BSC data to evaluate the implementation of a new strategy initiative, participants assumed the role of a manager of Clever Choice, Inc. (hereafter called CC), in order to determine whether to roll out the new strategy throughout the company. The strategic objective of CC, a chain of clothing stores, is to “delight the customer.” To help the firm achieve its strategic objective, top management has determined two strategic initiatives the stores could pursue: Fitting Room Service and a Customer Loyalty Program involving point cards. Each strategy initiative will have a set of performance measures linked to it. The manager’s task is to choose one of these two strategic initiatives and its associated performance measures, to be launched following year. The selected strategy is then implemented on a trial basis in four of eight stores under the manager’s control. Participants were asked to perform the task carefully as the new strategy initiative is important to the firm and is expected to increase the firm’s overall performance.

3.2. Experimental Materials

The experimental materials provided information about a hypothetical clothing company, Clever Choice, Inc. (CC), a firm specializing in the retailing of women’s apparel and operating throughout Canada. The participants’ task was to evaluate the success of a new strategy and a new set of strategy evaluation measures implemented at CC. The participants assumed the role of a regional manager who was personally responsible for overseeing eight stores in the British Columbia and Alberta regions. The experimental materials provided all participants with background information for the firm, and indicated that the firm was considering two different initiatives for implementation: (1) fitting room service, in which customers would be driven to use the fitting rooms more, and (2) a point cards program, in which customer loyalty would be rewarded with points. CC would

implement the strategy on a trial basis at only four of the eight stores, and according to strategy consultants, the effect of the new strategy would be visible within the first year of implementation.

Each new strategy came with a set of performance measures: one measure for each BSC perspective (financial, customer, internal process, and learning and growth) considered important for the strategy. When participants were asked to select one strategy, they also used the pre-specified performance measures that fit with the strategy. The success of the strategy implementation would affect all measures, but each strategy would have a unique measure with regard to the customer perspective. The unique measure for Fitting Room Strategy was conversion rate, while the important measure for Point Card Strategy was retention rate. However, when evaluating the BSC results, participants observed not only the four selected measures related to the strategy, but also four other measures that were not selected by the participants and not related to the strategy. Thus, participants evaluated two performance measures for each BSC perspective, whereby one of the measures in each perspective represented the selected measure and the other did not. This manipulation was meant to identify how much attention an individual allocates between the selected measures and the non-selected measures.

To evaluate the success of the strategy, participants compared BSC data of the four stores that adopted the strategy (adopters) with another four stores that did not adopt the new strategy (non-adopters). The BSC data showed that the initiative significantly improved only the customer perspective measure (either conversion rate or retention rate, depending on treatment and choice of performance measures; $t = 4.134$, $p < .05$), while the other performance measures (financial, internal business process, and learning and growth) did not improve significantly. The data also showed no correlation between the customer perspective measures and the financial perspective measures ($r = -0.24$, $p = 0.752$). This lack of impact on the financial perspective should cast significant doubt on the success of the new strategy.

3.3. Participants

Participants in this study were accountants from accounting firms and companies in the Vancouver, British Columbia, area. The minimum requirement for participation was an accounting degree and a minimum of one year of work experience; accounting certification was not necessary. These participants represented an ideal subject pool for this study, given their knowledge about the features of BSC (strategy maps, leading and lagging indicators, etc.), the provisions of which accountants presumably can discern when evaluating BSC data. Participants were informed that they were going to participate in a study on managers' judgments in evaluating a firm performance based on BSC data, and that they would wear an eye-tracking device. Each participant received \$50 in cash.

In mid-January 2014, the invitation was sent via email to several fellow accountants, who were asked to forward the flyers to their colleagues and friends who worked as accountants. By the end of April, there were no more participants signed up for the experiment. The invitations were closed then by the end of June 2014 and finally there were 75 accountants participated in the experiment.

In the invitation email, participants were informed that the eye-tracking device was sensitive to black or dark colored objects near the eye, and female participants were asked not to wear any eye makeup such as eyeliner, mascara, or eyelash extensions. However, three female participants did not thoroughly remove their eye makeup prior to the experiment. As a result, some remaining residual makeup around their eyes caused the eye-tracking device to improperly record their eye movements during the calibration process, and data from these participants were not included in the analysis. I also excluded data from six male participants for the following reasons. Two participants had thick, black eyelashes that resulted in a similar effect on the eye-tracking device as the residual eye makeup. Four male participants had either small or drooping eyelids, which likewise caused the eye-tracking device to fail to capture their eye movements. These are common problems in eye-tracking studies (Holmqvist et al., 2011).

In all, 66 usable responses were available for the data analysis. Thirty-eight (57.6%) of the participants were female. The average (median) age was 31.55 (29) years, and ranged from 23 to 59 years. Work experience ranged from 1 year to 23 years, with a

mean (median) of 7.52 (6) years. A majority (62.1%) of participants worked at non-accounting firms, and 63 participants (95.5%) indicated that their full-time work experiences were most closely related to accounting, auditing, and taxation. Forty-five (68.2%) participants had at least one accounting or finance designation (CA, CPA, CGA, CMA, or CFA), and 19 (28.8%) participants did not have any accounting or finance designation but were engaged in a training program for one of these designations.

3.4. Design

The experimental design employed in this study was a 2 × 2 design with two between-subjects factors. The first between-subjects factor was involvement, with two levels of treatment: no involvement and involvement. The second between-subjects factor was dissent (DA), with two levels of treatment: no DA and DA. Thus, participants were assigned to one of four different treatments: (1) no involvement – no DA, (2) no involvement – DA, (3) involvement – no DA, and (4) involvement – DA. The experimental materials are provided in Appendix C.

Participants in the no involvement condition received case materials that presented a set of BSC, followed by a sentence indicating that top management had decided to pursue one strategy, either the Fitting Room Service or the Customer Loyalty Program strategy (for details about the assignment of the strategy, see page 38). The case materials also presented the pre-selected performance measures associated with the pre-chosen strategy. To manipulate directional motivated reasoning, participants in the involvement condition received similar case materials to those in the no involvement condition, except that the participants were asked to choose their own strategy initiative (either Fitting Room Service or Customer Loyalty Program), which came with associated performance measures that were listed on the available scorecard for each strategy.

The dissent factor had two levels: no DA and DA. The DA treatment was based on Cosier's (1978) study, which was also used by Schwenk (1985, 1988). Participants in the DA groups received a memo from another manager whose role was that of a DA. This memo contained the DA's opinion regarding the chosen strategic initiative, and questioned

the assumptions underlying the decision about the strategy initiative that was chosen. The memo is addressed to the CEO of the firm, and it simply says:

In response to your request to review our new strategy initiative, based on our analysis we find that there is no significant difference in performance between the adopters and the non-adopters of the new initiative. Furthermore, there is substantial evidence that the measures do not have a significant causal effect to firm's overall performance and finally, the selected strategy initiative does not seem to significantly increase the performance of our company as we expected. Thus, to avoid unnecessary loss in the future, our recommendation is to re-evaluate and to delay the implementation of the new strategic initiative until further notice.

3.5. Procedure

In order to measure eye movement and gather related data during the performance evaluation process using BSC, the study used an eye tracker developed by Locarna, Inc. The eye tracker measured participants' visual attention, including eyeball fixation and saccade. *Eyeball fixation* refers to how long a participant's eyes stay focused on a certain area, and *saccade* is the quick movement between eyeball fixations. Eye tracking allows for the measurement of visual attention (i.e., fixation and duration) in real time. Although, under some circumstances, it is possible to look at something and visually attend to something else, eye movements and visual attention generally correspond under normal viewing (Cooke, 2005; Karn, Ellis, & Juliano, 1999). In the present study, visual attention was based on the length of fixation, that is, how long the participant's eyes stayed focused on certain information displayed in the BSC.

The Locarna eye-tracking system has an easy-to-use interface that allows researchers to tag each individual eye fixation (Tien, Zheng, & Atkins, 2011; Zheng et al., 2012). Fixation, which typically lasts between 200 and 500 milliseconds, occurs when the eye is fixated on a particular item (Goldberg & Wichansky, 2003, p. 503; Salvucci & Goldberg, 2000). The default setting of the Locarna eye tracker for the fixation is 333.33 milliseconds. This is the median of the normal range of fixation used in prior studies (Latimer, 1988; Rayner, 1998, 2009).

The Locarna eye-tracking works as follows. Essentially, the device records the eye movements by creating a data file that specifies the x–y coordinates of each gaze point (the spot where one is looking) with a time stamp. The Locarna software processes the raw eye-tracking data and presents each fixation as a cross on a snapshot of a video scene, allowing me to see where the participants fixed their eyes. I then manually assigns a tag to each fixation that represent the area of interest on the experimental materials, such as the “financial perspective” on the BSC. The tagging process was done by three research assistants. After all the fixations were tagged, the software program creates Excel files that store the fixation time associated with each tag. These tagged data are then used for further statistical analysis. To ensure the accuracy of the tagging in this study, each video tagged by a research assistant was verified by me.

Participants were randomly assigned to one of four treatment groups: (1) no involvement – no DA, (2) no involvement – DA, and (3) involvement – no DA, (4) involvement – DA. Participants in the involvement groups (groups 3 and 4) were allowed to choose one out of two strategies, while the non-involvement groups were not. Therefore, to minimize confounding that could arise from the strategy selection task, the pre-selected strategy assigned to participants in the non-involvement group was matched with the strategy selected by participants in the involvement group. For example, for every Point Card Strategy or Fitting Room Strategy selected by participants in the involvement group, I assigned a pre-selected Point Card Strategy or Fitting Room Strategy to participants in the non-involvement group. In this way, the groups that were being compared could artificially be made similar with respect to the strategy selection process (James, Mulaik, & Brett, 2006). Point biserial correlation among the strategy and the treatments were calculated and the result was not significant. Thus, there is no confounding factor from randomization.

The experimental procedure was as follows. First, participants were asked to fill out an informed consent form. After each participant filled out the form, participants were informed about the task in the experiment and then participants were asked to wear the eye tracker. In order to ensure that the tracker was able to measure each participant’s eye movements accurately, a calibration test of the eye tracker was conducted to trace a participant’s eye movement before starting the strategy evaluation experiment.

The calibration test or calibration procedure is conducted as follows. Participants were asked to wear the eye tracker so the software of the eye tracker can detect the pupil of the participants. Then I calibrated the system by capturing each participant's pupil positions by asking the participants to look at a piece of white paper with nine black dots (Appendix B) and to fix his or her eyes on each of the dots sequentially. The software recorded and "remembered" the pupil positions associated with each of these positions. The pupil position data is then used to map the eye movement recorded by the eye camera onto the scene video recorded by the scene camera and calculates eye fixation and coordinates the time spent on each fixation.

After the calibration process, each participant was instructed to take the envelope containing the case materials, read the instructions, and then read the background information about the firm and the new strategic initiatives and measures under consideration. The sequence of activities is outlined in Table 3.1.

Table 3-1. Task and Procedure

	Start
Step 1	Fill out an informed consent form Introduction to the tasks Briefly explain the instructions
Step 2	Calibration process <i>Eye tracking was started to record the next steps</i>
Step 3	<i>For non-involvement group:</i> Take the first envelope that contains the case materials Take the second envelop of pre-selected strategy that contains BSC data of the strategy implementation <i>For Involvement group:</i> Take the first envelope that contains the case materials Take the second envelope of the strategy selected by participants that contains BSC data of the strategy implementation
Step 4	Analyze the BSC data <i>For DA group, DA opinion was provided</i> Give evaluation/rate the success of the strategy implementation
Step 5	Fill out manipulation check
Step 6	Complete demographic information End.

Subjects in the no involvement condition received case materials followed by a sentence about how top management “has decided to pursue” the new strategic initiative and has selected performance measures that are believed to be important for evaluating the implementation of the new strategy. This no involvement condition provided a baseline setting for which participants made judgments without being involved in selecting the new strategy. Subjects in the involvement condition received case materials and were then asked to select a strategy initiative, to be rolled out in the firm, that came with the pre-selected performance measure to be used for evaluation purposes.

After reading the background information regarding the firm’s scorecard, participants were asked to rate, on a scale of 1 to 7, how confident they were about the selected strategy and its associated performance measures. Next, the participants received the results of the new strategic initiative in the form of a comparison of two groups

of stores under the manager's control: the adopters of the new strategy and the non-adopters of the new strategy. To avoid response error, BSC data i.e. numbers or percentage of each performance measure were identical and to be held constant regardless of experimental condition or strategy choice. That is, only the description of each measure is different between the two strategies while the number/unit/percentage of performance measures are the same for both strategy. BSC data for the entire calendar year were presented, along with the results as a percentage of the previous year's results. Participants were told that, based on experience verified by a strategy consultant, the effect of the new strategy would be visible well within the first year of implementation.

For both the involvement and no involvement conditions, I divided the participants into two groups: a no DA condition and a DA condition. Along with the results of the new strategic initiatives, participants in the DA treatment received a memo from another manager whose role was to provide a critique of the strategy initiative chosen by the firm; the memo questioned the assumptions underlying the firm's decision to implement it.

After reviewing the BSC results, participants rated, on a scale of 1 to 7, the success of the new initiative. Then they were asked to rate how successful the selected strategy was, how likely they would be to recommend continuing with the strategy, how successful the selected measures were, and how likely they would be to use the same measures for evaluating the strategy again (all questions were rated on a scale of 1 to 7). Participants then filled out a set of questionnaires to check the manipulation treatment in the experiment. Finally, participants were asked to respond to debriefing and demographic questions.

The participants were verbally informed that they could take as much time as they wished to finish the task and could stop at any time. However, I reminded the participants to perform the task carefully, as if their decisions could affect them financially. The average time to finish the task was 45 minutes, ranging from 25 minutes to 70 minutes.

3.6. Control Variables

Participants' understanding of the case was measured by asking for a self-reported rating of each question in a manipulation check. Demographic factors (gender, age, types of firms worked at, and work experience) were also controlled. Finally, additional demographic information, which included education, retail work experience, accounting designation, and prior research involvement, were provided by the participants.

3.7. Dependent Variables

In this study, the dependent variables were sequence of search, latency of search, and decision to roll out the new strategy. In my model (as shown in Figure 2), sequence of search and latency of search become the predictors (independent variables) of the decision variable.

To measure the sequence of search (both sequential and directive), I followed the procedure utilized by Hunton and McEwen (1997). For each participant, all of the following were collected from the eye-tracking output: the items accessed in the BSC, the order the items were accessed in, and the time spent on each item. I also developed an item sequence (ISEQ) variable to measure information search strategy: directive or sequential. To develop the ISEQ, I first recorded the sequence log of each informational item the subject accessed. Next, I identified each item by a position code on the BSC. Finally, I correlated the sequence log of information accessed and the position numbers of information presented, and the correlation coefficients comprising the ISEQ variable. A participant who is a sequential searcher will look at the items in the order they appear in BSC format, and hence, have a high degree of correlation between the log and position code. Directive searchers, on the other hand, who look for specific information, will exhibit a relatively low correlation between the log and position code. The dependent variable ISEQ has a value between 0 and 1. The higher the correlation, the more sequential the information search, and the lower the correlation, the more directive the information search. The statistical results of the dependent variable ISEQ in the hypotheses are presented in the following chapter.

The dependent variable for latency of search is the time that each participant spends on each performance measure. To test the time spent on certain measures, I employed the following procedure. First, I identified each item in the BSC as a selected or non-selected measure. The selected measures are measures associated or linked to the strategy initiative while the non-selected measures are measures that are not associated or not linked to the strategy initiative. Second, the eye-tracking software measured the number of times each participant fixated on selected and non-selected measures in the BSC. Third, I calculated the difference between time spent on two types of measures (selected and non-selected) by subtracting the time spent on selected measures from the time spent non-selected measures. Recall that the BSC data in this experiment showed that the strategy initiative significantly improved only the customer perspective measure (conversion rate measure for Fitting room strategy and retention rate measure for Point card strategy) of the stores that adopt the strategy. The other performance measures did not improve significantly in the stores that adopt the strategy or in other words there is no different of other performance measures between stores that adopt the strategy and that of do not adopt. Therefore, since the BSC results were not convincing, if individuals only pay attention on the selected measures and overlooked the non-selected measure, then it is likely that they will make a biased the decision

The dependent variable for the final decision is the decision to roll out the strategy and its associated selected measures. The two measures for the roll out decision each contained seven descriptive labels on a Likert-type scale, ranging from “Very unlikely to recommend the strategy” to “Very likely to recommend the strategy,” and from “Very unlikely to use the measures” to “Very likely to use the measures.”

3.8. Testing the Hypotheses

To test the hypotheses in this study, I used ANOVA to conduct a statistical test of whether or not the means of the dependent variables were all equal across four groups of managers: (1) no involvement – no DA, (2) no involvement – DA, (3) involvement – no DA, (4) involvement – DA. I also used a *t* test for hypotheses related to the difference of the means of dependent variables between two groups of treatments.

H1 was concerned with whether the information search behavior was different between managers who were involved in the strategy and performance measures selection process and those who were not involved in this selection process. H2 addressed whether managers who were involved in the selection of strategy and performance measures spent more time on their selected measures than on non-selected measures. To test H1, I analyzed the difference between group means of items sequence (ISEQ) variables of two groups of managers: no involvement and involvement. For H2, I tested the difference of the latency of search dependent variable—which is the time that each participant spends on each performance measure—within groups of managers and between two groups of managers (no involvement and involvement).

H3 and H4 addressed the information search behavior of individuals exposed to the dissent of a DA. To test these hypotheses, I used ANOVA to analyze the difference between the group means of items sequence (ISEQ) variables (H3) and between-groups means of time variables (H4). I used ANOVA to determine how this differed across all four groups of treatments.

H5 and H6 were concerned with the significance of interaction of main effects (involvement and DA). I used ANOVA to determine the difference across all four groups of treatments.

H7 and H8 were tested using a *t* test. The dependent variables for these two hypotheses were the decisions of managers as to whether they would recommend the strategy initiative for all other stores and whether they would recommend the selected measures to be adopted in other stores. The measure of the variables used a scale from 1 to 7, with descriptive labels ranging from “Very unlikely to recommend the strategy” to “Very likely to recommend the strategy,” and from “Very unlikely to use the measures” to “Very likely to use the measures.”

Chapter 4.

Results

This chapter is divided into four sections. The first section provides the post experiment analysis of power. The second section provides the analysis of the effectiveness of the randomization procedure, by testing the differences across cells in the demographic data and by testing whether participants have adequate understanding of BSC and the understandability of the experimental materials. The third section reports the results from the manipulation check. The fourth section reports the results of this study's eight research hypotheses. Finally, the fifth section reports additional findings of the study.

4.1. Post experiment analysis of power

A post hoc power analysis was conducted using the software package, G*Power 3 (Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner, 2007). The sample size of 66 was used for the post hoc power analyses. With $\alpha = .05$ and a 2×2 between-subjects design, the Cohen's statistical power for this study was .35 for detecting a medium effect ($f = .25$) and .76 for detecting a large effect ($f = .4$). Following Lindsay (1993), the statistical power for this study was .48 for detecting a medium effect ($f = .3$) and .93 for detecting a large effect ($f = .5$). In sum, there was adequate power (i.e., power = .80) at the large effect size level, but less than adequate statistical power at the medium effect size level. Therefore, the results of the statistical tests in this study should be interpreted in light of this statistical power.

4.2. Randomization Check

After responding to the manipulation check questions, the participants were asked to provide demographic information. One-way ANOVA was used for the randomization check; Table 4-1 presents the results for the differences across treatments. The results

show no significant differences across treatments for any of the four demographic variables—gender, age, work experience, and type of firm (accounting firm or non-accounting firm)—suggesting that the randomization procedure was effective.

Table 4-1. ANOVA test of randomization check

		Sum of Squares	df	Mean Square	F	Sig.
Gender	Between groups	.177	3	.059	.229	.876
	Within groups	15.944	62	.257		
	Total	16.121	65			
Age	Between groups	54.864	3	18.288	.391	.760
	Within groups	2903.500	62	46.831		
	Total	2958.364	65			
Firm	Between groups	.128	3	.043	.171	.916
	Within groups	15.403	62	.248		
	Total	15.530	65			
Work Experience	Between groups	67.860	3	22.620	1.120	.348
	Within groups	1252.625	62	20.204		
	Total	1320.485	65			

A MANOVA test was also conducted to test the randomization check. The results also show no significant difference across treatment for all of the four demographic variables except for work experience in treatment (4) involvement – DA which is only significant at $p < .1$. This results suggests that randomization procedure was generally effective.

An exploratory factor analysis with varimax rotation was conducted to assess the underlying structure of 34 items of the manipulation check. Four factors were requested based on the fact that the items were designed to index four constructs: (1) BSC understanding, (2) BSC understandability, (3) Involvement, and (4) Dissent. After rotation, the first factor accounted for 10.11% of the variance, the second factor accounted for 11.73%, the third factor accounted for 10.14%, and the fourth factor accounted for 14.14%. Table 4-2 displays 23 items and factor loadings for the rotated factors with factor loadings less than .3 omitted to improve clarity.

Table 4-2 Factor Loadings for the rotated factors

Items	Factor Loading			
	1	2	3	4
The link between strategy and performance measures is vital	.466			
In the balanced scorecard there are cause-and-effect relationships	.309			
I carefully studied all the information in order to come to a more informed decision	.567			
I carefully studied the relationships between the different perspectives	.620			
The balanced scorecard directed my attention toward the relationships between perspectives	.680			
I carefully studied the direct and indirect effects of the new initiative	.677			
I focused on the effects that the new strategy had on internal processes	.428			
I focused on the effects that the new strategy had on the financial perspective	.494			
The figure of the balanced scorecard provided in the instructions helped me in my analysis of the performance data	.407			
The case was easy to understand		.801		
The data that I analyzed was simple		.810		
The case was easy to do		.801		
I select the strategy and the performance measures			.422	
I will be blamed if the selected strategy and performance measures do not work out			.742	
I know exactly the reasons why I select the strategy and the measures			.505	
I feel my selection of strategy and measures are important to the company			.447	
I am responsible for the overall performance of Clever Choice			.327	
I read the manager's report (memo) about the analysis of the new initiative				.914
I understand the potential drawbacks of the new initiative as stated in the manager's report (memo)				.897
Before I read the manager's report (memo), I have made my decision				.878
After I read the manager's report, I re-evaluate the scorecard				.939
After I read the manager's report, I re-evaluate my decision				.845
After I read the manager's report, I change my decision				.816
Eigenvalues	3.841	4.458	3.855	5.374
% of variance	10.11	11.73	10.14	14.14

Note: Loadings < .3 are omitted

An important assumption underlying the theoretical arguments of this study is that participants are familiar with the format of BSC and understand that BSC provides causal effect between the leading indicators and the lagging indicators. Therefore, it would not be necessary to provide a strategy map for evaluating the BSC as suggested by Banker et al. (2004) or framing the scorecard as a causal chain as examined by Tayler (2010). To test this assumption, I developed a measure of BSC understanding from nine survey questions which are based on exploratory factor analysis as shown in Table 4-2 (for the items see Table 4-3). After finishing the task, each participant was asked to rate his or her agreement with each BSC understanding question, using a 7-point scale ranging from 1 (“Strongly disagree”) to 7 (“Strongly agree”). The Cronbach alpha calculated for BSC understanding was .68, which indicates that the items form a scale that has reasonable internal consistency reliability. The mean scores for all participants for each of the aforementioned statements were statistically significantly greater than zero (t statistics range from 29.5 to 67.8, all $p < .01$, two-tailed), indicating general agreement. In addition, additional t -test to check whether the aforementioned statements were statistically significantly greater than the midpoint of 4 on 7 point scale was performed and the result was significant (t statistics range from 4.3 to 22.8, all $p < .01$, two-tailed). This suggests that participants had an adequate understanding of BSC. Moreover, an ANOVA test was conducted to test agreement ratings for each of these statements across all treatments. The results for each statement are not significant. This is consistent with the assumption that participants have adequate understanding of BSC, such that this study does not need to provide a strategy map for evaluating the BSC or framing the scorecard as a causal chain or in other words the absent of strategy map or causal chain did not affect the study

To measure understandability of the case, participants were asked to rate on a 7-point scale their agreement with the statements, which are based on exploratory factor analysis as shown in Table 4-2, assessing the overall BSC understandability of the case and the BSC data.. The statements addressed whether “The data that I analyzed was simple” and whether the case was “easy to do” and “easy to understand.” The Cronbach alpha calculated for BSC understandability was .72, which indicates that the items form a scale that has reasonable internal consistency. Moreover, the mean scores for all participants for each of the aforementioned statements were statistically significantly greater than zero (t statistics range from 38.2 to 46.3, all $p < .01$, two-tailed), indicating

general agreement. In addition, additional t-test to check whether the aforementioned statements were statistically significantly greater than the midpoint of 4 on 7 point scale was performed and the result is significant (t statistics range from 9.9 to 12.3, all $p < .01$, two-tailed). This suggests that participants had an adequate understanding of the case. Table 4-3 shows the results of mean response of the BSC understanding and BSC understandability

Table 4-3. Mean responses of BSC understanding and BSC understandability for each treatment

	No involvement – no DA	No involvement – DA	Involvement – no DA	Involvement – DA
BSC understanding				
The link between strategy and performance measures is vital	5.94	6.00	5.94	5.88
In the balanced scorecard there are cause-and-effect relationships	5.81	5.88	5.72	5.88
I carefully studied all the information in order to come to a more informed decision	6.00	5.88	6.06	6.19
I carefully studied the relationships between the different perspectives	5.81	5.75	5.89	5.75
The balanced scorecard directed my attention toward the relationships between perspectives	4.75	5.81	5.33	5.50
I carefully studied the direct and indirect effects of the new initiative	5.38	5.31	5.61	5.06
I focused on the effects that the new strategy had on internal processes	4.63	4.75	5.06	4.25
I focused on the effects that the new strategy had on the financial perspective	6.00	6.25	6.17	5.69
The figure of the balanced scorecard provided in the instructions helped me in my analysis of the performance data	5.38	5.44	5.28	5.06
BSC understanding scale	5.52	5.67	5.67	5.47
BSC understandability				
The case was easy to understand	5.13	5.69	5.39	5.63
The data that I analyzed was simple	4.75	5.69	5.67	5.50
The case was easy to do	5.31	5.63	5.44	5.63
BSC understandability scale	5.31	5.63	5.44	5.63

4.3. Manipulation Check

H1 and H2 were concerned with whether the information search behavior is different between managers who are involved in the strategy and performance measures selection process and managers who are not involved in this selection process. The involvement treatment was manipulated by asking participants to select their own strategy and associated performance measures to be implemented in the firm. The involvement manipulation check is composed of eight items, which are based on exploratory factor analysis as shown in Table 4-2, and each manipulation was rated on a 7-point scale from 1 (“Strongly disagree”) to 7 (“Strongly agree”). Answers to these eight items were averaged, yielding a single measure of involvement. The Cronbach alpha calculated for involvement was .746, which indicates that the items form a scale that has reasonable internal consistency reliability. In order to evaluate construct validity, I tested whether the involvement manipulation could discriminate between involvement and no involvement. Table 4-4 depicts the elements of the involvement manipulation.

H3 and H4 were concerned with whether the information search behavior is different between managers who receive dissenting opinions in the form of a DA and managers who do not receive the dissenting opinion. The dissent or DA treatment was manipulated by giving participants in these treatments a memo from another manager, whose role was to provide a critique of the chosen strategy initiative. This DA critique questioned the assumptions underlying the firm’s decision to implement the initiative. The DA manipulation check was composed of six items which are based on exploratory factor analysis as shown in Table 4-2. (e.g., “I read the manager’s report [memo] about the analysis of the new initiative,” “I understand the potential drawbacks of the new initiative as stated in the manager’s report”), which were rated on a 7-point scale from 1 (“Strongly disagree”) to 7 (“Strongly agree”). A reliability analysis was conducted for these six items to yield a single measure of dissent (DA) treatment. The Cronbach alpha calculated for DA was .946. Table 4-5 depicts the elements of the involvement manipulation.

Table 4-4. Mean responses to questions regarding involvement manipulation by treatment^a

Involvement comprehension	No Involvement ^b	Involvement ^b	Difference in treatment means ^c
I select the strategy and the performance measures	4.16	5.26	1.10***
I will be blamed if the selected strategy and performance measures do not work out	4.78	4.91	0.13
I know exactly the reasons why I select the strategy and the measures	5.00	5.71	0.71**
I feel my selection of strategy and measures are important to the company	5.47	6.12	0.65**
I am responsible for the overall performance of Clever Choice	4.28	4.97	0.69*
I am responsible for the performance of my regional offices	5.88	5.79	(0.09)
I am responsible for the financial performance of Clever Choice	4.19	5.09	0.90**
I am responsible for the financial performance of my regional offices	5.38	5.88	0.50*
Involvement scale ^d	4.89	5.47	0.57

^a Participants were asked to rate their agreement with each statement on a 7-point scale where 1 was labeled “Strongly disagree” and 7 labeled “Strongly agree.”

^b Mean responses for all participants exceed 0 ($p < .01$, two-tailed).

^c A two-sample means test was used to test the null hypothesis that means for both treatments are equal. *, **, and *** indicate that the null hypothesis can be rejected at significance levels of $p < .1$, $p < .05$ and $p < .01$, respectively.

^d Average of responses to involvement manipulation.

Since participants in group 1 (no involvement – no DA) and group 3 (involvement – no DA) were not given the DA opinion, I tested the construct validity of DA by comparing the mean of the four items of DA between group 2 (no involvement – DA) and group 4 (involvement – DA). I predicted that there would be no significant difference in DA treatment between the two groups. Table 4-5 depicts the elements of the DA manipulation. The results show that the mean difference between the two groups for each question from 1 to 5 in Table 4-5 is not significant. It means that participants understood the DA opinion regardless the involvement of participants in selecting the strategy and the pre-selected measures—except for question 6 in Table 4-5, where the mean difference is significant,

meaning that participants in the involvement – DA treatment were more likely to change their decision.

Table 4-5. Mean responses to questions regarding DA manipulation by treatment^a

Dissent (DA) comprehension	DA without involvement	DA with involvement ^b	Difference in treatment means ^c
I read the manager's report (memo) about the analysis of the new initiative	5.94	6.31	-0.37
I understand the potential drawbacks of the new initiative as stated in the manager's report (memo)	5.75	5.44	0.31
Before I read the manager's report (memo), I have made my decision	4.88	4.06	0.81
After I read the manager's report, I re-evaluate the scorecard	3.81	3.50	0.31
After I read the manager's report, I re-evaluate my decision	4.63	4.13	0.50
After I read the manager's report, I change my decision	2.75	1.88	0.87*
DA scale ^d	4.63	4.22	0.41

^a Participants were asked to rate their agreement to each statement on a 7-point scale where 1 was labeled "Strongly disagree" and 7 labeled "Strongly agree."

^b Mean responses for all participants exceed 0 ($p < .01$, two-tailed).

^c A two-sample means test was used to test the null hypothesis that means for both treatments are equal.

* indicates that the null hypothesis can be rejected at significance level of $p < .1$.

^d Average of responses to DA manipulation.

4.4. Hypothesis Tests

To test H1 through H6, an ANOVA analysis was conducted. Planned contrasts were performed within each group to test whether information search was more directional (sequential) in the involvement (DA) condition compared to the control conditions, and to examine whether a DA can moderate information search behavior. I also tested the difference in time spent on selected compared to non-selected measures in the involvement and DA conditions compared to the control conditions. The difference is measured by the proportion of time spent on selected and non-selected measures.

Panel A of Table 4-6 shows the mean and standard deviations of ISEQ or items sequence (as the measure of information search) by experimental cell. Panel B of Table 4-6 shows the mean and standard deviations of the difference in time spent on selected versus non-selected measures (as the degree of latency of search). Table 4-6 is the ANOVA table that shows the result of planned comparisons of the ISEQ (Panel A) and the proportion of time spent on selected and non-selected measures (Panel B).

Table 4-6. Descriptive statistics of item sequence (ISEQ) and time difference between selected and non-selected measures

Panel A: Mean ISEQ (Standard Deviation)^a

Involvement ^b		Devil's advocate ^c		All
		No DA	DA	
No Involvement	Mean	.4919	.7200	.6059
	SD	(.1163)	.2323	(.2147)
		N = 16	N = 16	N = 32
Involvement	Mean	.3128	.7288	.5085
	SD	(.1643)	(.1288)	(.2566)
		N = 18	N = 16	N = 34
All	Mean	.3971	.7244	.5558
	SD	(.1682)	(.1848)	(.2405)
		N = 34	N = 32	N = 66

^a ISEQ is a correlation coefficient between the sequence log of information accessed and the position numbers of information presented. The ISEQ has a value between 0 and 1. The higher the correlation, the more sequential the information search, and the lower the correlation, the more directive the information search.

^b Participants in the involvement condition received case materials that asked them to choose their own strategy initiative (either Fitting Room Service or Customer Loyalty Program) and associated performance measures listed on the available scorecard for each strategy. Participants in the no involvement condition received case materials, followed by a sentence indicating that top management had decided to pursue one strategy, either the Fitting Room Service or the Customer Loyalty Program strategy.

^c Participants in the dissent (DA) treatment received a memo from another manager whose role was to provide a critique of the strategy initiative chosen by the firm, questioning the assumptions underlying the firm's decision to implement it.

Panel B: Mean time difference between selected and non-selected measures^a

Involvement ^b		Devil's advocate ^c		All
		No DA	DA	
No Involvement	Mean	2.9000	17.9313	10.4156
	SD	(16.4504)	(25.4778)	(22.4352)
		N = 16	N = 16	N = 32
Involvement	Mean	8.4833	16.2000	10.4156
	SD	27.9276	28.0024	(22.4352)
		N = 18	N = 16	N = 32
All	Mean	5.8559	17.0656	11.2909
	SD	23.0825	26.34929	25.1692
		N = 34	N = 32	N = 66

^a The difference in time spent on the measures is calculated by subtracting the time spent on non-selected measures from the time spent on all selected measures. Positive value means that time spent on selected measures is larger than time spent on non-selected measures.

^b Participants in the involvement condition received case materials that asked them to choose their own strategy initiative (either Fitting Room Service or Customer Loyalty Program) and associated performance measures listed on the available scorecard for each strategy. Participants in the no involvement condition received case materials, followed by a sentence indicating that top management had decided to pursue one strategy, either the Fitting Room Service or the Customer Loyalty Program strategy.

^c Participants in the dissent (DA) treatment received a memo from another manager whose role was to provide a critique of the strategy initiative chosen by the firm, questioning the assumptions underlying the firm's decision to implement it.

Table 4-7. Analysis of variance (ANOVA) results of the effects of involvement and dissent (DA) on the information search behavior (ISEQ) and difference in time spent between selected and non-selected measures

Panel A: Effects of involvement and dissent (DA) on information search behavior (ISEQ)

Source	df	Mean Square	F	Sig.
Corrected Model	3	.679	24.493	.000**
Intercept	1	20.892	753.079	.000**
Involvement	1	.119	4.304	.042**
Dissent (DA) ^b	1	1.707	61.527	.000**
Involvement * Dissent	1	.145	5.233	.026**
Error	62	.028		
Total	66			
Corrected Total	65			

$R^2 = .542$

^a Participants in the involvement condition received case materials that asked them to choose their own strategy initiative (either Fitting Room Service or Customer Loyalty Program) and associated performance measures listed on the available scorecard for each strategy.

Participants in the no involvement condition received case materials, followed by a sentence indicating that top management had decided to pursue one strategy, either the Fitting Room Service or the Customer Loyalty Program strategy.

^b Participants in the dissent (DA) treatment received a memo from another manager whose role was to provide a critique of the strategy initiative chosen by the firm, questioning the assumptions underlying the firm's decision to implement it.

** denotes significance at $\alpha = .05$, two-tailed.

Panel B: Effects of involvement and dissent (DA) on difference in time spent between selected and non-selected measures

Source	df	Mean Square	F	Sig.
Corrected Model	3	786.498	1.256	.297
Intercept	1	8523.061	13.613	.000
Involvement	1	61.050	.098	.756
Dissent (DA) ^b	1	2129.010	3.401	.070*
Involvement * Dissent	1	220.127	.352	.555
Error	62	626.086		
Total	66			
Corrected Total	65			

$R^2 = .06$

^a Participants in the involvement condition received case materials that asked them to choose their own strategy initiative (either Fitting Room Service or Customer Loyalty Program) and associated performance measures listed on the available scorecard for each strategy.

^b Participants in the dissent (DA) treatment received a memo from another manager whose role was to provide a critique of the strategy initiative chosen by the firm, questioning the assumptions underlying the firm's decision to implement it.

* denotes significance at $\alpha = .1$.

4.4.1. Hypotheses 1 and 2

The purpose of testing H1 and H2 was to see whether involvement in selecting the strategy and the associated performance measures compelled the decision maker, first, to search for information in a more directive way; and second, to spend more time on his or her selected performance measures when evaluating the results of the implemented strategy using the BSC. Specifically, H1 states that the correlation between the order of the items appearing in the BSC and the sequence of items searched by individuals (ISEQ variable) is lower in the involvement group than in the no involvement group. H2 posits that the difference in time spent on selected versus non-selected measures is greater in the involvement group than in the no involvement group.

I tested these hypotheses using ANOVA, and the results (shown in Panel A of Table 4-7) reveal that the main effect of involvement is significant, $F = 4.4.304 (1), p < .05$.

Thus, participants who were involved in the strategy and performance measures selection process were more directive in searching information in the BSC. However, Panel B of Table 4-7 reveals that the main effect of involvement on the difference in time spent on selected versus non-selected measures was not significant. Therefore, H1 is supported, while H2 is not supported. Thus, consistent with previous motivated reasoning research, directional motivated reasoning causes individuals to employ directive search (not following the sequence in which information is located or presented); however, there is no evidence that it causes them to spend more time on information that is consistent with their beliefs. Figure 3 illustrates the main effect of involvement on information search and latency search.

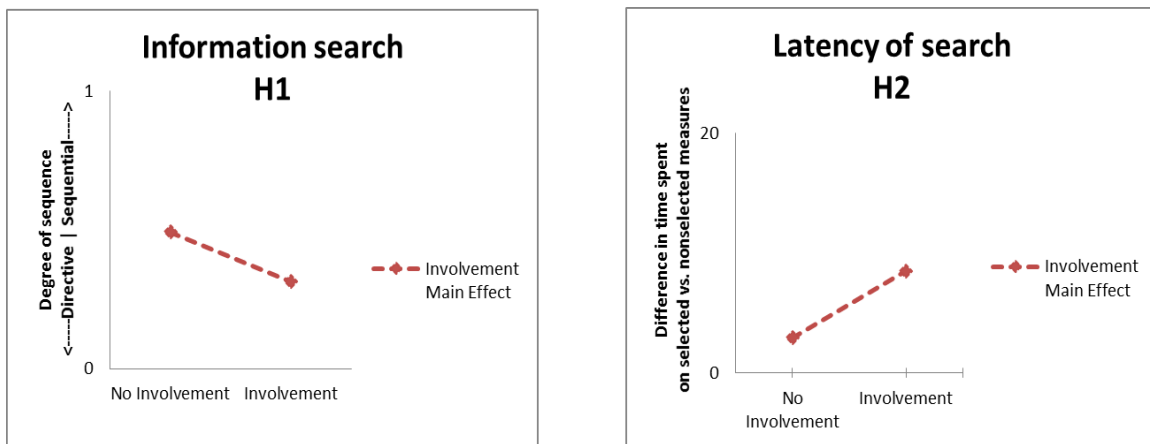


Figure 4-1 The main effect of involvement on information search and latency search

4.4.2. Hypotheses 3 and 4

H3 predicts that the presence of dissent in the form of a DA will prompt the decision maker to search for information in a more sequential way, compared to those who are offered no dissent. H4 predicts that the presence of dissent in the form of a DA will cause decision makers to spend time equally on both selected and non-selected performance measures when evaluating the results of the implemented strategy using the BSC. Specifically, H3 predicts that the correlation between the order of items as they appear in the BSC and the sequence of items seen by individuals (ISEQ variable) will be higher in the DA group than in the no DA group. H4 predicts that the difference in time spent on

selected versus non-selected measures will be smaller in the DA group than in the no DA group.

The results shown in Panels A of Table 4-7 reveal that the effect of dissent is significant, $F = 61.527 (1), p < .05$. Thus, individuals in the dissent (DA) treatment who receive a memo from another manager that provides a critique of the strategy initiative and performance measures chosen by the firm, sequentially search the results of the performance measures they preferred when evaluating the BSC. However, although the main effect of the dissent is significant, as shown in Table 4-7, Panel B, we need to be cautious in interpreting these results. While H4 predicts that the difference in time spent on selected versus non-selected measures will be smaller in the DA group than in the no DA group, the results given in Table 4-7, Panel B, show the opposite to be true. As Panel B shows, the mean difference in time spent on selected versus non-selected measures in the DA group is larger (17.06) than that of the no DA group (5.86). I ran a t test to find the significance of this difference between the two groups, and the results show that the difference in time spent on selected versus non-selected measures in the DA group is not significant at $p < .05$, but it is significantly larger than that in the no DA group at $p < .1$ ($t = -1.834$). In other words, participants in the DA treatment actually spent significantly more time on selected measures than they did on non-selected measures. Therefore, H3 is supported, while H4 is not supported. Figure 4 illustrates the main effect of DA on information search and latency search.

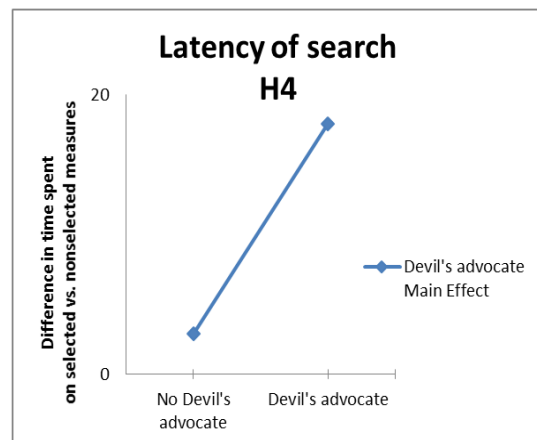
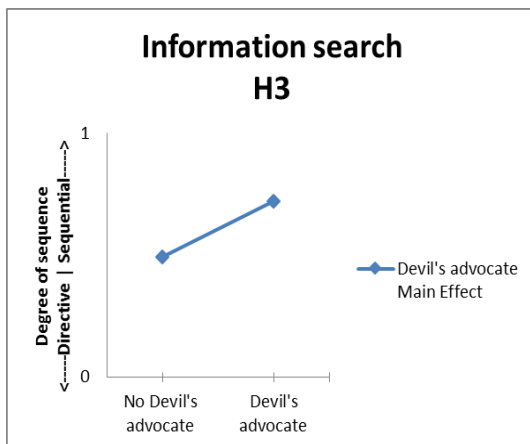


Figure 4-2 The main effect of DA on information search and latency search.

4.4.3. Hypotheses 5 and 6

H5 and H6 predict an interaction effect between dissent and involvement. Specifically, H5 predicts that the presence of dissent in the form of a DA will prompt the decision maker (who was involved in the strategy and performance measures selection process) to sequentially read the BSC when evaluating the success of his or her chosen strategy. H6 predicts that the presence of dissent in the form of a DA will cause individuals who were involved in the strategy and performance measures selection process to spend time equally on both selected and non-selected performance measures when evaluating the results of the implemented strategy using the BSC.

Table 4-7 depicts the results of the interaction between the two treatments. Panel A of Table 4-7 reveals that the interaction effect of dissent and involvement is significant, $F = 5.233 (1), p < .05$. Thus, the presence of dissent in the form of a memo from another manager, that provides a critique of the strategy initiative and performance measures chosen by the firm, significantly changed the information search behavior of individuals who were involved in the selection process; when provided with the DA opinion, these individuals would sequentially read the BSC report. For H6, however, the interaction effect of dissent and involvement is not significant, as shown in Panel B. Therefore, H5 is supported, while H6 is not supported. These results indicate that the DA's opinion effectively confronted individuals' prior beliefs and persuaded the individuals to consider all information in the BSC by sequentially evaluating the BSC results. However, the DA's opinion did not affect the amount of time participants spent on non-selected measures; rather, it increased the duration of attention on selected measures, which could be an indication that participants reconsidered their decision as a part of a confirmation process to validate their position and bring it closer to the DA's opinion. Figure 5 illustrates the interaction effect between involvement and DA on information search and latency search.

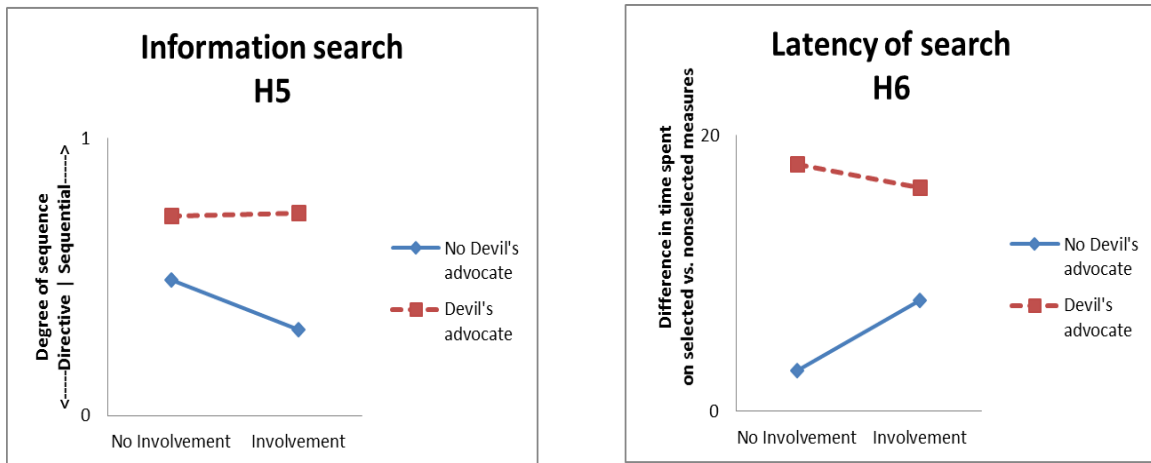


Figure 4-3 The interaction effect between involvement and DA on information search and latency search

4.4.4. Hypotheses 7 and 8

Before testing H7 and H8, it is interesting to see whether there is a significant difference between participants' rating of their confidence in the strategy *before* they evaluated the BSC results, and their decision whether to roll out the strategy *after* they evaluated the BSC results. This result will explain the link between the presence of cognitive dissonance, dissonance reduction via information search behavior, and the decision whether to roll out the new strategy.

Table 4-8 shows that the mean *recommendation* to roll out the strategy is significantly lower than the mean *confidence* in implementing the strategy. These results imply that after reviewing the BSC results, participants lowered their propensity to implement the strategy because the strategy implementation results were unconvincing. I predicted that because the result of the strategy implementation of the adopters of the strategy was not convincing, cognitive dissonance occurs in each cell: (1) no involvement – no DA, (2) no involvement – DA, (3) involvement – no DA, and (4) involvement – DA. As predicted by Festinger (1957), when individuals simultaneously hold two contradictory cognitions, they will experience dissonance, and in order to reduce the dissonance they will directly search for selected performance measures that are consonant with their prior belief that the strategy would be successful. However, the results in Table 4-8 do not provide a clear explanation of how individuals decide whether to roll out the new strategy

or to cancel the implementation of the new strategy, even though they all eventually adjusted their prior belief in the success of the new strategy.

Table 4-8 Paired sample *t* test of mean difference between the level of confidence in the strategy and the decision to roll out the strategy

Involvement	Devil's advocate		Overall	
	No DA	DA		
No Involvement	Mean difference (Confidence – Recommendation)	.250 (5.38 – 5.13)	0.69 (5.00 – 4.31)	.469 (5.19 – 4.72)
	<i>SD</i>	(0.931)	(1.488)	(1.218)
	<i>p</i>	.300	.077*	.037**
	<i>N</i>	16	16	32
Involvement	Mean difference (Confidence – Recommendation)	.83 (6.00 – 5.17)	.88 (5.75 – 4.88)	.853 (5.88 – 5.03)
	<i>SD</i>	(1.465)	(2.217)	(1.828)
	<i>p</i>	.027**	.135	.010**
	<i>N</i>	18	16	34
Overall	Mean difference (Confidence – Recommendation)	.559 (5.71 – 5.15)	.781 (5.38 – 4.59)	
	<i>SD</i>	(1.260)	(1.845)	
	<i>p</i>	.014**	.023**	
	<i>N</i>	34	32	66

* significant at the .1 level (two-tailed).

** significant at the .05 level (two-tailed).

In addition, I tested whether there was a significant difference in information search behavior across groups. As depicted in Table 4-9, participants in the involvement group had a lower ISEQ than those in the no involvement group, while participants in the DA group had a higher ISEQ than those in the no DA group. These results are consistent with the results from testing H1, which showed that in order to reduce the dissonance, the involvement group directly searched for performance measures that were consonant with their previous belief that the strategy would be successful. Interestingly, as Table 4-9 shows, although participants confronted with the DA opinion experienced dissonance,

they searched for information more sequentially than did those in the no DA treatment. This result is consistent with H5, which predicted that the DA opinion would effectively moderate individuals' beliefs and persuade them to consider all information by evaluating the BSC results sequentially.

Table 4-9 t-test of items sequence (ISEQ) and for each main effect

	No Involvement	Involvement	<i>t</i>
ISEQ	.6059	.5085	1.667*
<i>N</i>	32	34	
	No DA	DA	<i>t</i>
ISEQ	.3971	.7244	-7.532***
<i>N</i>	34	32	

* significant at the .1 level (two-tailed).

*** significant at the .01 level (two-tailed).

Hitherto, the results show that participants adjusted their prior belief of the success of the strategy implementation. I predict that this adjustment was due to unconvincing results of the BSC data. The unconvincing results created dissonance and when individuals were experience dissonance, they will directly search information that are consonant with their prior belief i.e. the selected measures associated with the selected strategy. In addition, we have seen that there is a significant difference of information search behavior among participants when searching information for their decision. However, it is not clear if the information search behavior was associated with the decision to rollout the new strategy.

H7 and H8 predict that bias in decision making arises from the way individuals search for information and from the latency of information search. Specifically, if individuals employ directive search as they directly analyze the performance measures they preferred, and if they spend more time on those preferred measures, they will be more likely to recommend the implementation of their chosen strategy than are individuals who do not employ directive search. Note that because of the unconvincing results of the

BSC in the experiment case materials, it is reasonable to assume that participants would not be willing to roll out the new strategy. Therefore, a decision to implement the strategy is a biased decision.

H7 predicts that there is a positive correlation between information search behavior and individuals' decisions, such that a directive search behavior is associated with the decision to roll out the implementation of the strategy initiatives. H8 predicts that increased time spent by individuals on their preferred performance measures will be associated with the decision to roll out the implementation of the strategy initiatives.

To test these hypotheses, I correlated the ISEQ variable, the latency variables (the time spent on items and the difference in time spent on selected and non-selected measures), and the roll out decision. The Pearson product–moment correlation coefficient was calculated to explain the possible relationship between these variables. Table 4-10 depicts the correlation matrix with the mean and standard deviation of the ISEQ variable, the latency variables (time spent on items), and roll out decision.

Table 4-10 shows that the ISEQ score was significantly correlated with the roll out decision to implement the strategy ($r = -.409$). Since low (high) ISEQ indicates directive (sequential) search, and the roll out decision ranges from “Very unlikely to recommend the strategy (measures)” to “Very likely to recommend the strategy (measures),” the negative correlation suggests that the more directive (sequential) the search, the more likely participants are to roll out (not to roll out) the initiative. The latency of search, which is the time spent on selected or preferred measures, correlates well with the decision to implement the strategy ($r = .304$). In addition, the difference in time spent on selected and non-selected measures positively correlates with the decision to implement the strategy ($r = .265$). Therefore, both H7 and H8 are supported.

Table 4-10 A correlation matrix with means and standard deviations

Variable	Mean	SD	1	2	3	4	5
1. Items sequence (ISEQ)	.5558	.2405	-	-	-	-	-
2. Selected measures duration	50.115	43.788	-.204	-	-	-	-
3. Non-selected measures duration	38.824	27.863	-.250*	.844**	-	-	-
4. Difference in time spent on Selected and Non-selected	11.29	25.169	-.077	.805**	.362**	-	-
5. Do you recommend the strategy	4.88	1.574	-.409**	.304*	.239	.265*	-
6. Do you recommend the measure	4.83	1.343	-.329**	.139	.114	.115	.820**

* Correlation is significant at the .05 level (two-tailed).

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

4.5. Supplemental Analysis

In H2, H4, and H6, I used the difference in duration between time spent on selected measures and time spent on non-selected measures as the proxy of latency of search. I further evaluated the latency of search using two different measures, which are the duration ratio of selected measures to the total duration on selected and non-selected measures and the difference between the two types of measures scaled by total time spent on both measures. In H2, I argued that individuals in the involvement group would be likely to spend more time on selected performance measures than on non-selected performance measures, whereas individuals in the no involvement group would spend equal time on both the company's selected and non-selected measures. Thus, I can infer that the duration ratio of selected measures to total duration of time spent on selected and non-selected measures is higher than that of the duration ratio of non-selected measures. Along the same line, H4 predicted that participants in the DA group would spend time

equally on both selected and non-selected performance measures. In addition, I also used the duration ratio of selected measures to total duration of selected and non-selected measures as a dependent variable to test the interaction between the two main effects of involvement and dissent. In H6, I argued that dissent would cause the difference in time spent on selected versus non-selected measures to be smaller among individuals in the DA group than in the no DA group.

Using ANOVA and duration ratio of selected measures to total duration as the dependent variable, I found that the main effect of involvement is not significant, while the main effect of dissent is significant, $F = 4.539 (1)$, $p < .05$, and the interaction is not significant. While H4 predicted that the difference in time spent on selected versus non-selected measures is smaller in the DA group than in the no DA group, the main effect of dissent (DA) is significant. This means that the mean duration ratio of selected measures to total duration of selected and non-selected measures in the dissent (DA) treatment is actually larger than in no dissent treatment ($t = -2.177$, $p < .05$). In other words, participants in the DA treatment actually spent even more time on selected measures than on non-selected measures. In addition, using difference between the two types of measures scaled by total time spent on both measures as the dependent variable, I found that the main effect of involvement is not significant, while the main effect of dissent is significant, $F = 4.475 (1)$, $p < .05$, and the interaction is not significant.

Therefore, my model is robust and able to test the latency of search, since the results from using the difference in time spent on selected versus non-selected measures are consistent with the results from using the duration ratio of selected measures to total duration of selected and non-selected measures and using difference between the two types of measures scaled by total time spent on both measures.

I also tested the mean difference between duration on selected measures and duration on non-selected measures across all treatments. The results show that the duration of time spent on selected measures was higher when a dissenting opinion (DA) was present. This indicates that the role of a DA is to help an individual to carefully examine the performance of the selected measures compared to the non-selected

measures. Table 4-11 presents the paired sample *t* test of mean difference in duration of time spent.

Table 4-11 Paired sample *t* test of mean difference in duration between time spent on selected measures and time spent on non-selected measures

Involvement ^b		Devil's advocate ^c	
		No DA	DA
No Involvement	Mean different	2.90	17.93
	<i>SD</i>	16.450	25.477
	<i>p</i>	.492	.013**
Involvement	Mean different	8.48	16.20
	<i>SD</i>	(27.927)	(28.002)
	<i>p</i>	.215	.035**

** significant at the .05 level (two-tailed).

I also evaluated whether latency (difference of time spent between selected and non-selected measures) or sequence (ISEQ) of search is the best predictor of the decision to roll out or not to roll out the strategy. Using logistic regression analysis, each variable's effect on the likelihood of rolling out the strategy is estimated. The dependent variable in the regression is the mean split of the decision to recommend the strategy, in which the decision is 1 for not rolling out the strategy, or 2 otherwise. The omnibus test of model coefficients indicates that the model of the equation is significant ($-2 \log L = 66.156$, $\chi^2 = 14.814$ (6), $p < .05$). The model predicts that approximately 28% (Nagelkerke R^2) of the variance in whether participants are likely to roll out the strategy or not can be predicted from the linear combination of the two variables. Table 4-12 presents the likelihood ratios, which suggest that the odds of rolling out the strategy are increasingly (decreasingly) greater as individuals' ISEQ decreases (increases), and increasingly (decreasingly) greater as the difference between time spent on selected and non-selected measures increases (decreases).

Table 4-12 **Logistics regression predicting roll out decision with ISEQ and difference in time spent on selected and non-selected measures as predictors**

Variable	B	SE	Odds Ratio	p
ISEQ	-3.985	1.547	.019	.010*
Difference in time	.044	.020	1.045	.029**
Gender	.000	.645	1.000	.999
Age	.020	.064	1.021	.749
Firm	-.010	.652	.990	.988
Work experience	-.027	.089	.974	.765
Constant	2.510	1.931	12.300	.194

* significant at the .1 level (two-tailed).

** significant at the .05 level (two-tailed).

Chapter 5.

Discussion and Summary

This chapter discusses the results and implications of this research. The first section discusses the results presented in Chapter 4 and considers the implications of these findings. The second and third sections present the limitations of this study and ideas for future research.

5.1. Discussion and Implication of Research

In essence, the first part of this study looked at the influence of motivated reasoning and dissent on information-search behavior and the information-search style on the decision-making process. The second part examined if there is a correlation between sequence and latency of search and the decision to roll out a particular strategy. Hypotheses 1 through H6 test the first part of the study, while H7 and H8 examine the primary research question of the second part of the study.

The first part of the current research resulted in the finding that a decision-maker's motivation and exposure to dissent (i.e., a DA opinion) directly influenced the way these individuals search BSC information in evaluating the strategy and performance measures of a firm. Those who are exhibiting motivated reasoning employ more directive search strategy compared to those who presented with a DA opinion, who employ a more sequential search strategy compared to those who do not encounter a dissenting view. Specifically, these results were obtained by testing H1 and H3.

Hypothesis 1 investigated the main effect of motivated reasoning, namely whether individuals who are prone to motivated reasoning employ directive search strategy. Consistent with Kunda (1990), participants in our study who were involved in strategy and performance measures selection searched information in a more directive way; when evaluating the BSC results, their attention was focused directly on the selected measures. Hypothesis 3 investigated the main effect of dissent on information-search behavior. After

testing H3, I find that a DA stimulates individuals' cognitive processes such that they will access a wider range of information when evaluating BSC results. Individuals so prompted seek this wider range of information by employing sequential information search in order to achieve a more thorough consideration of alternatives.

However, the latency of information search in decision-makers presented with a dissenting view is no different whether they are involved or not involved in the strategy and performance measures selection process. The results from testing H2 show that the duration of attention on items in BSC of individuals in involvement is not significantly different between the selected measures and non-selected measures. Using the difference between time spent on selected and non-selected measures as the main dependent variable, I do not detect a significant difference for subjects in the involvement and non-involvement treatment conditions. This evidence rejects H2.

In contrast, by testing H4, the results show that the latency of information search is significantly different between those who are in DA treatment and non-DA treatment. For individuals in DA treatment, the duration of time spent on items in BSC was significantly different for selected versus non-selected measures. Those who received a dissenting opinion spend even more time on selected measures than on non-selected measures. However, since my prediction in H4 is that individuals in the DA group will spend time equally on both selected and non-selected performance measures, I must reject the alternative H4 (accept the null H4) based on the statistical result.

These results provide significant evidence that the sequence and latency of information-search behavior, which is the second step in decision-making process (Bonner, 2008), is significantly affected by circumstances around the individual while making a decision. In this study, the circumstances are involvement and dissent. These two factors affect information-search behavior differently. On the one hand, when individuals are involved in the strategy and performance measures selection process, they consider their preferred strategy and performance measures to be good strategy and measures. Furthermore, when they are asked to evaluate the success of their chosen strategy and performance measures, they first evaluate the performance of each measure

they selected. Attention is focused directly on these chosen measures because, to the decision-maker, the measures they selected are more important than measures they did not select. Cues about the importance of the selected measures are thus activated; causing these individuals to directly search and pay attention to their chosen preferred measures associated with the strategy. In addition, based on H2, decision-makers did not spend more time on the selected measures and this is a strong indication that selective information-search behavior indicates less cognitive effort being used, which might lead to bias in decision-making.

These results also demonstrate evidence of dissonance reduction process through the directive information search. These results also explain the link between the presence of dissonance reduction via information search behavior and the decision whether to roll out the new strategy. When confronted with two conflicting decisions: that the strategy selected is good but the results showed the opposite, individuals who are involved in the strategy selection process will reduce this dissonance by adding new cognitive elements that are consonants with the fact of the strategy is actually successful even though the evidence is insignificant. In the presence of dissonance, then, individuals in this study search and select information that would reduce dissonance and at the same time avoid new information that might increase the dissonance. This results confirm the reduction of cognitive dissonance by Festinger (1957).

A comment from a participant in Involvement group below indicates his/her strong belief that the strategy that he/she selected is successful.

Although there is not much change with the rest of the perspectives, there has been improvement in the customer perspective, which is very important. The more customer loyalty CC is able to build, the better financial (sales) it could possibly obtain in the future. With learning and growth, more training should be provided since there is a slight learning curve due to the new program. This could be the reason why theirs is not much change in the quadrant.

On the other hand, when individuals receive a dissenting opinion that provides a critique questioning the success of the selected strategy and performance measures, they

try to confirm their initial beliefs by sequentially searching for information that supports their beliefs. This confirmation process is shown in the fact that participants spent more time on their selected measures than on the measures they did not select (rejecting H4 in its alternative form). As shown in a supplementary analysis in Table 4-9, there is strong evidence that, when evaluating a vague result from a newly implemented strategy, individuals will even spend more time on the selected measures than on non-selected measures. This thorough information search (sequential and with greater latency) indicates a stronger cognitive effort on the part of these individuals, exerted in order to confirm their position with others.

My findings in the interaction between involvement and DA suggest that DA or dissenting opinions mitigate the information-search behavior of individuals who succumb to motivated reasoning. The sequence of search changed when I introduced a dissenting opinion, while the latency of search also changed as such that participants paid even more attention to selected measures as a part of a confirmation process to validate their position with others.

The finding that those who received a dissenting opinion spend even more time on selected measures than on non-selected measures was a surprising result. This phenomena is consistent with the notion of belief polarization: when 2 people has similar information but they have opposing opinion between each other, each individual will evaluate and spent even more time on the same information or evidence they both have (Kelly, 2008; Lord, Ross, & Lepper, 1979). This result suggests that the dissent treatment compels individuals to confirm their beliefs about the selected measures by spending even more time on those measures in order verify the DA's dissenting opinion. By spending more time on their selected measures, participants might want to reaffirm their previous belief and confront their belief with the dissenting opinion.

Contrary to the general view of belief polarization theory that individuals will strengthen their prior belief after observing the same evidence, individuals at the same time might also realize that the new strategy implementation was not a success (although one measure indicated an improving performance, the overall performance of the stores that adopted the new strategy were not significantly different from the non-adopter stores)

particularly when they sequentially search the information. They had to revise their belief and employ a contrary updating process, a phenomenon where two people update their beliefs in opposite directions after observing the same evidence, which converge their prior belief to the dissent opinion. This anomaly of belief polarization was explained by Jern, Chang, and Kemp (2009). Thus, given the positive correlation between the decision to rollout the strategy and the time spent on selected measure (Table 4-10), I must conclude that the more time and attention decision-makers spend on unsuccessful measures, the more likely they are to realize that the strategy that was implemented has not worked. This increased latency of search helps participants to decide not to roll out the new strategy.

For the second part of this study, I predicted that sequence and latency of information search are correlated with the individuals' decision. In other words, I expected to find that those exhibiting directive search strategy would be more likely to continue to roll out the new strategy even though the results of the strategy were somewhat obscure. Compared to those who did not receive a DA opinion employ more directive search, those who receive the DA opinion will search for information sequentially.

A comment from participant in DA treatment, after receiving DA opinion, indicates his/her doubt about the success of the new strategy.

I agree that the strategy does not increase the performance of the firm and even though a higher conversion rate was observed, sales growth was similar. The scorecard does not imply a significant causal effect to the performance.

Finally, based on the evidence in this study, I conclude that bias does indeed exist in searching and using information in the presence of motivated reasoning, and that this bias in searching and using information leads to suboptimal decision-making. This study shows that when individuals receive a dissenting opinion from a DA, this dissent helps to mitigate such bias by leading the individuals to sequentially search for the information they need to make their decision. Contrary to my prediction, the presence of a DA does not lead individuals to spend equal time between selected and non-selected measures, but it does compel individuals to spend more time on the selected measures to confirm their good opinion of the measures they previously had confidence. This confirmation process

helps individuals to reach better decisions, which in the case of this particular study, was not to continue to roll out the new strategy implementation.

This study sheds greater light on the decision-making process of individuals under certain circumstances. From an accounting perspective, the significant finding of this study is the discovery of a robust correlation between the sequence and latency of information search and individuals' decisions related to that information. This finding has great significance in that its robustness enhances the ability of firms to design an effective strategy evaluation reporting and to improve the development and viability of the BSC. Furthermore, the role of dissent in accounting decision is also shown to be significant. Sequential search prompted by the introduction of a DA helps individuals to seek out and consider more information before making a decision, and the confirmation process instigated by reading the DA view helps individuals to exert more cognitive effort to compare all available information, which in turn leads to a better decision. Finally, this study discovers how motivated reasoning works in reducing dissonance. While previous literature was unable to show the dissonance reduction via selective attention, this study shows a real information search behavior of individuals when searching for information to support their prior beliefs.

5.2. Limitations

The present study has begun to increase our understanding of the relationship between individuals' circumstances and the decision they make. We know that motivation affects the way in which individuals search for and use information, as well as that the method of searching and using information eventually affects the decision that is made. To my knowledge, this is the first study that investigates the process of decision-making with the help of eye-tracking device.

Although the results are justifiable, they should be interpreted with a reasonable amount of caution, since they may not generalize to other settings. The study utilized a small number of participants, which though sufficient for obtaining statistical significance, may limit the generalizability of the results. With the current sample size, the probability of rejecting the null hypothesis, where there is a medium effect ($f = .25$) and large effect ($f =$

.4) is .35 and .76 respectively. Therefore, caution is recommended since there was adequate power (i.e., power = .80) at the large effect size level, but less than adequate statistical power at the medium effect size level. However, since the participants are professionals in the accounting field, the study produced results representative of managers who make strategy evaluation decisions in an organizational context.

The artificial case setting, necessary for the experimental design, also poses a limitation for the results. Having only a few pages of information about an organization does not align with the practical and experiential knowledge that a real-world decision-maker would have in this context. This feature of the research is useful for control, but creates a limitation in interpreting the results. Also, the context of the experiment in which the firm outperforms their targeted goals on every performance measure except for the customer satisfaction measure to demonstrate the effect of the chosen strategy implementation could be regarded as seeming artificial, which in turn, could have affected the results. In addition, in this study, each strategy came with a set of associated and preselected performance measures, meaning participants could not freely choose any particular measure(s) their choice of strategy, but rather, had to take the assigned performance measures along with their chosen strategy. However, this was intended to control for simplicity in the experiment and to maintain perceived uncertainty about the success or lack of success of the chosen strategy implementation. Although this design feature is a bit different from prior studies in this research stream, the results of the current study are still comparable to the results obtained from prior work.

5.3. Future Research

The present study has increased our understanding of the relationship between judgment and decision quality and an individual decision-maker's environment. This study shows that an individual's environment clearly affects decision quality through environmental influence on the process of searching and using information. Yet it remains possible that a causal relationship between judgment, decision, and information search is indirect, in which case there is a pressing need to discover the complete steps of this cognitive process, including the interplay between: memory retrieval, information search,

problem representation, hypothesis generation, and hypothesis evaluation. Further research is required to investigate this.

This current study also warrants future research on the interplay of the four dimension of information search, which are depth of search, sequence of search, content of search, and latency of search. This study only shows two dimensions of the information search which are the sequence of search and latency of search while it remains silent in exploring the other two dimensions (depth of search and content of search). It is possible to discover if there is any causal relationship among the four dimensions and individuals' decisions.

It would also be interesting to know if this relationship exists robustly across different uses of other financial information, from Income Statements, to Balance Sheets, to Statements of Cash Flow. How are cues in each financial statement interrelated, and what sequence of search do individuals employ in different tasks and environments? Obviously, the research involved in probing these issues is considerable; yet the technique provided by eye-tracking methodologies makes such problems increasingly tractable. Consequently, there is real hope that robust and genuine answers can be provided for these questions in a way that traditional accounting research has had little ability to pursue.

This study could begin filling the future research questions suggested by Cosier (1978) by drawing conclusions regarding the nature of dissent in the decision-making process. By understanding how information search functions across three dissent approaches (expert approach, DA approach, and the dialectical inquiry), we potentially explain the relative effectiveness of these three forms of dissent in improving strategic decisions. Moreover, in using eye-tracking, we can avoid the "demand" or "Hawthorne effect" biases of individuals who are being observed, since what we observe is not the behavior of the individuals, but rather, the actual cognitive process of individuals based on their information-seeking behavior through eye movement.

These new applications for eye tracking point to an exciting future, potentially transforming our approach to observing and advancing our understanding of the role of attention in accounting decision-making. No longer does research have to rely solely on

multiple sets of experimental treatments; eye-tracking techniques have the potential to impart a simple but robust design to the study of attention in accounting decision-making and to allow this type of research to gain a firmer scientific footing.

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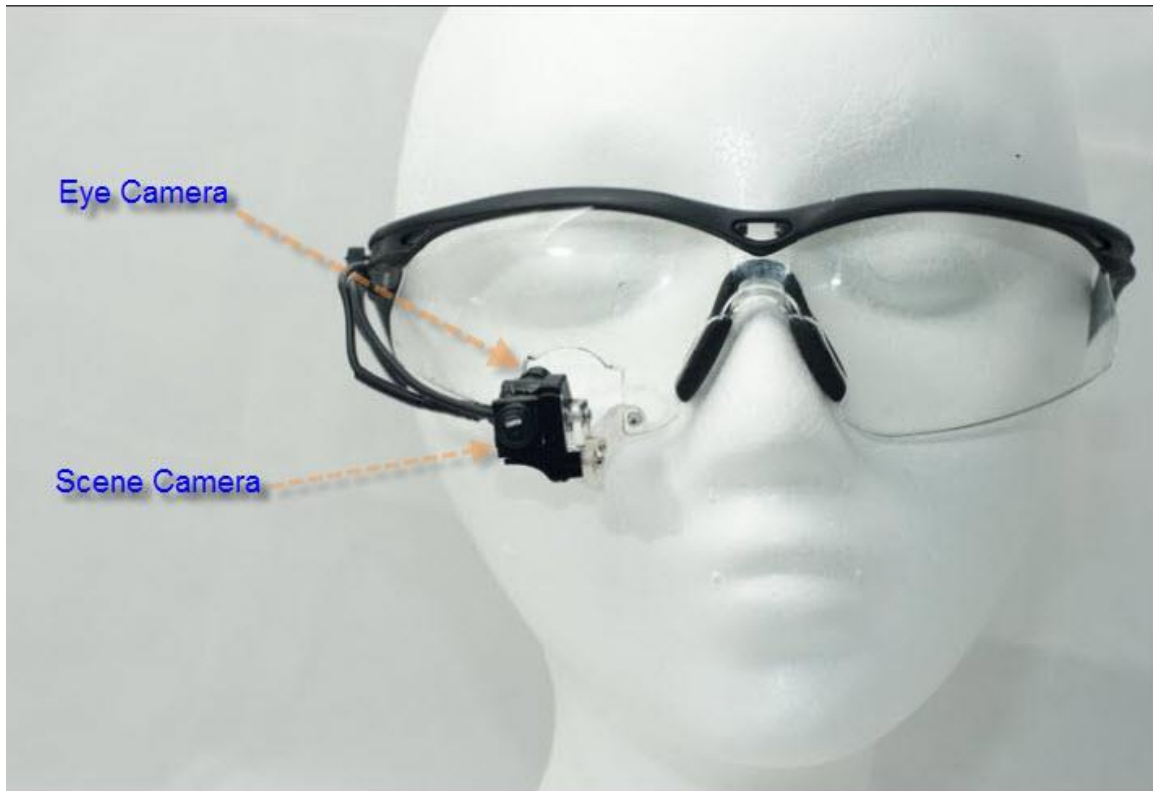
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Appendix A.

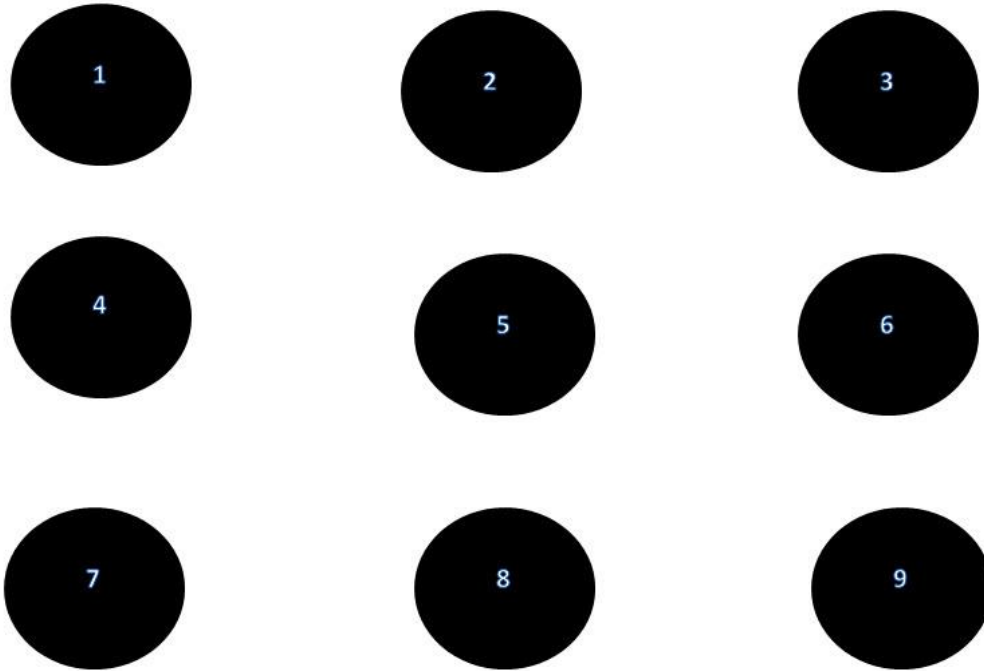
The Locarna Eye-Tracking Device



The Locarna eye-tracking device consists of a set of eye glasses, one eye camera, one scene camera, a customized laptop computer that records the data, and a software program that records and processes the eye-tracking data. In this study, participants were asked to wear the eyeglasses with the two cameras attached to them. The total weight of the glasses with the cameras is only 30g. In this experiment, all participants were asked, after they put on the glasses, whether they felt comfortable wearing them. Every participant was told to take off the glasses and stop the task if he or she felt uncomfortable wearing them. None of the participants withdrew from the experiment because of being uncomfortable wearing the glasses.

Appendix B.

Calibration System



After participants put on the glasses, I calibrated the system to capture each participant's pupil positions. Each participant was asked to look at a piece of white paper with nine black dots and to fix his or her eyes on each of the dots sequentially. The software recorded and "remembered" the pupil positions associated with each of these positions. The pupil position data is then used to map the eye movement recorded by the eye camera onto the scene video recorded by the scene camera and calculates eye fixation and coordinates the time spent on each fixation.

Appendix C.

Experimental Materials

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INFORMED CONSENT

This research is being conducted under the permission of the Simon Fraser Research Ethic Board. The chief concern of the Board is for the health, safety and psychological well-being of participants. Should you wish to obtain information about your rights as a participant in research, the responsibilities of researchers, or have questions or concerns, please contact the Associate Director, Office of Research Ethics by email at [...] or phone at [...]

TITLE: The Balanced Scorecard as a strategy evaluation tool: The effect of motivated reasoning and devil's advocate on information search and strategy evaluation decision

INVESTIGATORS: Tota Panggabean, under the supervision of Yasheng Chen, PhD

PURPOSE OF THE STUDY: You are invited to participate in a research study investigating analysis of managerial accounting data. The study provides you with the benefit of increased practice considering material related to managerial accounting. We expect the study's results to help accounting regulators, managers, and academics better understand accounting analysis.

PARTICIPATION: Your decision whether or not to participate is voluntary. If you decide to participate, you are free to withdraw at any time without penalty or to skip any questions you do not wish to answer.

PROCEDURE: If you agree to be in this study, we will ask you to make a judgment about a set of performance information, and to answer demographic questions. The study should take about 45 minutes to complete. You will wear an eye-tracking device during the study to record your eye movement when you are reading the performance information.

RISK: There are no foreseeable risks to you in participating in this study. Please let me know if you have any concerns during the study.

Benefits: There may or may not be direct benefits to you from taking part in this study. However, in the future, others may benefit from what we learn in this study.

PAYMENT: Upon completion of the study, you will receive \$50 for your participation in this research study.

CONFIDENTIALITY: Individual responses in this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify you. Research records will be kept in a locked file; only the researchers will have access to the records. The data from the eye-tracking device will be kept on a computer hard disk and only the researchers will have access to the data.

WITHDRAWAL: If you choose to enter the study and then decide to withdraw at a later time, all data collected about you during your enrollment in the study will be destroyed.

STUDY RESULT: The results of this study will be reported in a graduate dissertation and may also be published in journal articles and books.

CONTACT FOR INFORMATION: This research is conducted by Tota Panggabean. Please ask any questions you have now. If you have questions later, you may contact the researcher.

CONTACT FOR COMPLAINTS: If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Associate Director, Office of Research Ethics by email at [...] or phone at [...]

FUTURE USE OF PARTICIPANT DATA: We may use your data for future use of research materials for educational purposes.

FUTURE CONTACT: Please indicate if you would like to receive invitation to participate in future studies. Circle your answer.

1. Yes. I would like to participate in your future studies. Please contact me by email/phone.
2. No. I don't want to participate in your future studies.

CONSENT AND SIGNATURE: Taking part in this study is entirely up to you. You have the right to refuse to participate in this study. If you decide to take part, you may choose to pull out of the study at any time without giving a reason and without any negative impact on you employment.

Your signature below indicates that you have received a copy of this consent form for your own records.

Your signature indicates that you consent to participate in this study.

_____ (mm/dd/yy)

Participant Signature

Date

Printed name of the participant signing above

Strategy Evaluation Research Project

Instructions

In this study, you will be presented with performance information for a clothing retailer. Using this data, your task is to assess the performance measures currently in use and to determine which new strategy they ought to adapt. Please perform this task carefully, **as if your decisions could affect you financially.**

Please observe the following guidelines:

1. Remember, this activity is voluntary—you can leave at any time and choose not to answer any question.
2. Go through the materials in the order presented and PLEASE:
 - DO NOT READ AHEAD
 - FEEL FREE TO REFER BACK TO PREVIOUS MATERIAL AS NEEDED
 - DO NOT CHANGE YOUR ANSWERS TO PREVIOUS QUESTIONS IF YOU REFER BACK TO PREVIOUS MATERIAL
3. Please use only information available in this material. No additional information needed to answer all the questions in this material.
4. Please **do not discuss this experiment with anyone you know that will also be participating in this experiment.**
5. Please start now.

Background Information

> General

Your task is to analyze the success of a new strategy and a new set of strategy evaluation measures implemented at Clever Choice, Inc. (CC), a firm specializing in the retailing of women's apparel that operates throughout Canada. You will assume the role of a regional manager for CC who is currently considering a foray into the European markets. CC has 48 stores across Canada; each provides clothing directed at particular niches within the women's apparel market. You are personally responsible for overseeing eight stores in the British Columbia and Alberta regions.

The strategic objective at Clever Choice, Inc. is to "Delight the customer." To help the company achieve its strategic objective, top management has determined two strategic initiatives: "Fitting Room Service" and a "Customer Loyalty Program" that the stores could pursue. Neither initiative would create additional fixed costs. Both initiatives would generate equivalent increases in variable costs. Prices will not be increased in conjunction with either of the initiatives. The initiatives under consideration are:

1) Fitting Room Service:

Conversion is the most important feature in the apparel business, and for the apparel retailer, conversion happens in the fitting room. Make sure you have a customer service strategy that drives fitting room usage. And make sure service is available on demand once they are in the fitting room, because the longer they stay, the more they will buy. If you drive fitting room usage and take care of the fitting room customer, your conversion should be good and you will sell more merchandise at full retail with fewer markdowns.

2) Point Cards Program:

Your ability to retain customers demonstrates how viable your business is over the long-term. Make sure you adopt customer loyalty programs such as point cards program.

The point cards program gives \$20 off for the next purchase every time a customer spends \$100.

>> **No Involvement Treatment**

(For Fitting room Strategy)

“In the end, the top management (the CEO) **has decided** to pursue the Fitting Room Strategy as the new strategic initiative along with its measures.”

The top management team then met with each divisional manager to communicate this firm-wide mission and to discuss the role of each regional manager in evaluating the strategy using a Balanced Scorecard for his or her region. To analyze the success of the strategy at CC, the top management has developed implementable measures. For now, only **one** measure from each perspective of BSC perspective has been selected by the top management. The following measures are believed to be important for **Fitting Room Strategy**. However, other measures will be presented in a complete Balanced Scorecard.

Financial perspective	Sales Growth
Customer-related perspective	Conversion rate
Internal business process perspective	Orders filled within one week
Learning and growth perspective	Employee satisfaction

Please see Exhibit 1 for detail explanation of each measure.

(For Point Cards Strategy)

“In the end, the top management (the CEO) **has decided** to pursue the Point Cards Strategy as the new strategic initiative along with its measures.”

The top management team then met with each divisional manager to communicate this firm-wide mission and to discuss the role of each regional manager in evaluating the strategy using a Balanced Scorecard for his or her region. To analyze the success of the strategy at CC, the top management has developed implementable measures. For now, only **one** measure from each perspective of BSC perspective has been selected by the

top management. The following measures are believed to be important for **Point Card Strategy**. However, other measures will be presented in a complete Balanced Scorecard.

Financial perspective	Sales Growth
Customer-related perspective	Retention rate
Internal business process perspective	Orders filled within one week
Learning and growth perspective	Employee satisfaction

Please see Exhibit 1 for detail explanation of each measure.

>> *Involvement Treatment*

The top management team then met with each regional manager to communicate this firm-wide mission and to discuss the role of each regional manager in evaluating the strategy and the implementable measures from Balanced Scorecard for his or her region.

As the regional manager over the Clever Choice, the final decision of which strategic initiative and related implementable measures for the scorecard to pursue are yours. For now, only one measure from each perspective of BSC will be selected. Please select which of the above strategies you believe Clever Choice should pursue at this time by placing a checkmark next to your selection below (please select **only one** of the strategies):

Fitting Room Service

The following measures are believed to be important for **Fitting Room Strategy**. However, other measures will be presented in a complete Balanced Scorecard.

Financial perspective	Sales Growth
Customer-related perspective	Conversion rate
Internal business process perspective	Orders filled within one week
Learning and growth perspective	Employee satisfaction

OR

Point Cards Program

The following measures are believed to be important for **Point Card Strategy**. However, other measures will be presented in a complete Balanced Scorecard.

Financial perspective	Sales Growth
Customer-related perspective	Retention rate
Internal business process perspective	Orders filled within one week
Learning and growth perspective	Employee satisfaction

Please see Exhibit 1 for detail explanation of each measure.> General

Frank Benitez is the CEO of CC. He recently received some feedback regarding the current performance measures to the effect that they are unclear and inaccurate for supporting organizational decisions. The measures overlook the importance of the firm's relationship with its environment, particularly with its customers. Thus, there is a significant need to have a new set of performance measures, since the firm is soon planning to launch a new strategic initiative.

In 2012, Frank attended a seminar about Balanced Scorecard at Simon Fraser University. He learnt that Balanced Scorecard contains a set of causally-linked performance measures carefully chosen to represent important aspects of a business unit in the four areas of: financial performance, customer relations, internal business processes, and finally, learning and growth. These measures should be drivers of the unit's success and linked to its strategy and mission. A brief description of each type of measure follows:

Financial perspective	Indicates how well a business unit is doing in meeting profitability and other economic targets.
Customer-related perspective	Indicates a business unit's success in obtaining and retaining the targeted customers.
Internal business process perspective	Indicates a business unit's performance on activities critical to meeting the customer and financial targets.
Learning and growth perspective	Indicates a business unit's success in developing the personnel and systems necessary for growth and improvement in the long run.

Frank has considered adopting Balanced Scorecard as a performance evaluation system for a new strategic initiative they are going to implement. This new strategy depends mainly on the needs of the firm's customers. To adopt the Balanced Scorecard, Frank has taken several steps. First, he met with CC's top management team to explicate the firm's overall mission. This team determined that the following mission statement was appropriately inspirational and captured the company's goal:

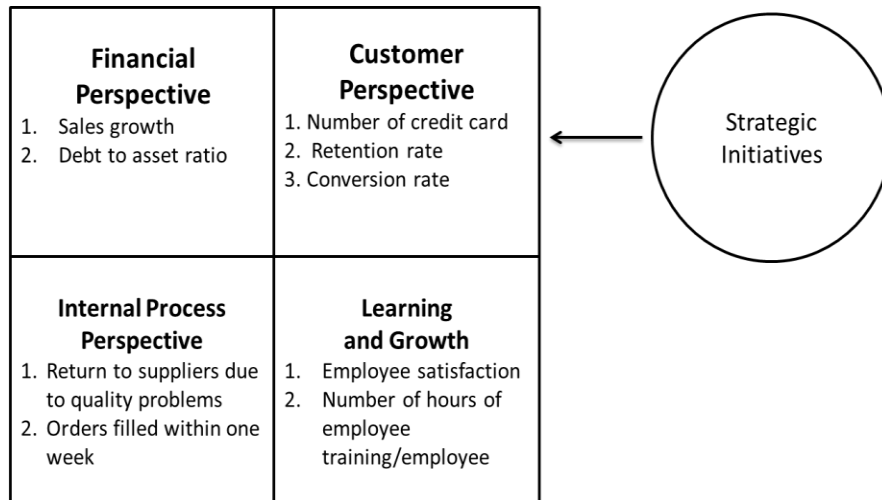
We will be an outstanding apparel supplier in each of the specialty niches served by CC.

> **General**

The Balanced Scorecard

Please read the following information carefully before proceeding to the next page.

Clever Choice Inc. will use a “balanced scorecard” to measure performance at each of its store. The balanced scorecard reflects the reality that strategic success depends not only on strong financial performance, but also on performance in a variety of other dimensions. In particular, a typical scorecard emphasizes the following four categories: financial, customer, internal processes, and learning and growth. The balanced scorecard is not just a measurement tool. Companies use their scorecard to focus on improvement in areas thought to be particularly important to strategic success. **Please take a moment to examine the figure to below**, which depicts the four scorecard dimensions at Clever Choice and the measures in those dimensions.



> **General**

Exhibit 1: Clever Choice Inc.: Balanced Scorecard Measures 2012 – Fitting Room Strategy Measures 2012

The CC BSC Measures
Financial Sales growth (<i>2013 sales – 2012 sales</i>) / <i>2012 sales</i> Debt-to-assets ratio (<i>total business unit liabilities / total business unit assets</i>)
Customer Conversion rate (<i>Number of Visitors using fitting room / Number of Customers</i>) Number of credit card customers per store
Internal Process Return to suppliers due to quality problems Orders filled within one week
Learning and Growth Employee satisfaction (rating, out of 100%, compiled from monthly, rolling employee survey) Number of hours of employee training/employee

> **General**

The strategy to be implemented is selected by the top management; it is not selected by you.

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

Please rate how confident you are on the selected strategy on CC future performance.

Strongly not confidence	Not Confidence	Slightly not confidence	Neutral	Slightly confidence	Confidence	Strongly confidence
1	2	3	4	5	6	7

The measures to evaluate the strategy are selected by the top management; it is not selected by you.

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

Please rate how confident you are on the effect of the selected measures on CC performance.

Strongly not confidence	Not Confidence	Slightly not confidence	Neutral	Slightly confidence	Confidence	Strongly confidence
1	2	3	4	5	6	7

Please rate how responsible do you feel for the performance of Clever Choice Inc.

Strongly feel no responsibility	No responsibility	Slightly not responsibility	Neutral	Slightly responsible	Responsible	I feel fully responsible for performance
1	2	3	4	5	6	7

Please turn to the next page after reading the material and answering the questions above.

> **General**

Your Task

Exhibit 2 in the next page is balanced scorecard data from the 8 stores of Clever Choice Inc. that you oversee in the British Columbia and Alberta regions for the years 2012 and 2013.

The new measures the top management selected were implemented in January 2012, and the new strategic initiative was implemented in January 2013. **Note that**, as indicated on the scorecard, the strategy was implemented on **a trial basis at only 4 of the 8 stores**. The 8 stores are similar in terms of dimensions (size, customers, service, etc.). Strategy consultants have indicated that any effects of the new strategy will be visible well within **the first year** of implementation.

For each measure, the percent of above target performance for 2013 is given as well as the 2013 performance as a percent of 2012 performance (i.e. 2013/2012 is percentage of 2013 relative to 2012)

Based on the scorecard, your task is to decide whether or not CC should continue the new strategic initiative and whether or not to continue using the measures the top management has selected for the extension of the initiative. Evaluate thoroughly the scorecard data in Exhibit 2 to answer the questions on the next page after the scorecard data.

>>**DA treatment**

In addition, since the strategy implementation was **on a trial basis** and to assure that the strategy works to all CC stores if it eventually will be implemented, Frank Benitez has appointed other group of managers to find any downsides of the strategy selected by the top management. Please find the memo in Exhibit 3.

>>DA treatment

EXHIBIT 3

MEMO

To: Mr. Benitez

Re: Review on new strategy initiative

In response to your request to review our new strategy initiative, based on our analysis:

- 1. There is no significant difference in performance between the adopters and the non-adopter of the new initiative.*
- 2. Furthermore, there is substantial evidence that the measures do not have a significant causal effect to firm's overall performance.*
- 3. The selected strategy initiative does not seem to significantly increase the performance of our company as we expected.*

Thus, to avoid unnecessary loss in the future, our recommendation is to re-evaluate and to delay the implementation of the new strategic initiative until further notice."

Thank you.

Briefly discuss whether you agree or disagree with this memo.

Exhibit 2

Stores #.	ADOPTER				NON ADOPTER			
	1	2	3	4	5	6	7	8
FINANCIAL PERSPECTIVE								
Sales Growth 2013	36.50%	40.10%	30.20%	37.20%	31.60%	32.50%	41.90%	39%
Sales Growth 2013/2012	103	101	98	101	100	103	101	98
Debt-Equity Ratio 2013	18.07%	17.05%	19.20%	20.10%	16.55%	18.78%	21%	16.27%
Debt-Equity Ratio 2013/2012	101	99	108	98	99	98	101	108
CUSTOMER PERSPECTIVE								
Conversion Rate 2013	69.48%	68.15%	65.06%	67.94%	59.81%	58.96%	61.03%	62.80%
Conversion Rate 2013/2012	109	112	114	108	88	100	99	101
Number of Credit card 2013	8900	9010	9100	9200	8100	8200	8600	8275
Number of Credit card 2013/2012	111	113	114	115	110	111	115	112
INTERNAL PROCESS PERSPECTIVE								
Order filled in one week 2013	83%	80%	79%	76%	81%	78%	82%	78%
Order filled in one week 2013/2012	109	105	101	100	106	108	100	103
Return to suppliers 2013	7%	8%	8%	10%	7%	8%	9%	9%
Return to suppliers 2013/2012	100	107	114	136	106	115	135	103
LEARNING AND GROWTH PERSPECTIVES								
Employees training hr 2013	11.43	11.48	11.85	12.2	13.02	11.45	12.4	12.07
Employees training hr 2013/2012	110	104	113	109	111	113	108	110
Employee satisfaction 2013	88%	80%	89%	89%	75%	77%	84%	89%
Employee satisfaction 2013/2012	110	100	112	111	110	102	107	111

Questions

Please answer the following questions (feel free to refer back to the data on the previous page):

- 1) Based on balanced scorecard results, how successful do you believe the selected strategy has been so far (on a scale of 1 to 7)? (Indicate your rating on the scale with an 'X'.)

Very Unsuccessful 1	Unsuccessful 2	Somewhat Unsuccessful 3	Neutral 4	Somewhat Successful 5	Successful 6	Very Successful 7

- 2) List (and briefly discuss) each factor you considered in analyzing the level of success of the new strategy at Clever Choice:

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- 3) Based on balanced scorecard results, how likely would you be to recommend implementing the selected strategy in the remainder of the Clever Choice Inc. stores in the (on a scale of 1 to 7)? (Indicate your rating on the scale with an 'X'.)

Very Unlikely 1	Unlikely 2	Somewhat Unlikely 3	Neutral 4	Somewhat Likely 5	Likely 6	Very Likely 7

- 4) Based on balanced scorecard results, how successful do you believe the selected performance measures have improved your store so far (on a scale of 1 to 7)? (Indicate your rating on the scale with an 'X'.)

Very Unsuccessful 1	Unsuccessful 2	Somewhat Unsuccessful 3	Neutral 4	Somewhat Successful 5	Successful 6	Very Successful 7

- 5) List (and briefly discuss) each factor you considered in analyzing the selected performance measures at Clever Choice:

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- 6) Based on balanced scorecard results, how likely would you be to recommend implementing the selected performance measures in the remainder of the Clever Choice Inc. divisions in the (on a scale of 1 to 7)? (Indicate your rating on the scale with an 'X'.)

Very Unlikely 1	Unlikely 2	Somewhat Unlikely 3	Neutral 4	Somewhat Likely 5	Likely 6	Very Likely 7

7) Based on balanced scorecard results, do you believe that the selected performance measures can help your store achieve its target?

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

If your answer is No, what are performance measures you prefer to be in the Scorecard?

	Your Preferred Measure
Financial measures	
Customer-related measures	
Internal business process measures	
Learning and growth measures	

8) Based on balanced scorecard results, if you can postpone the implementation of the selected strategy, would you postpone the implementation of strategy and the selected performance measures?

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

9) If your answer is Yes, how likely would you be to postpone the implementation the selected strategy in the remainder of the Clever Choice Inc. divisions in the (on a scale of 1 to 7)? (Indicate your rating on the scale with an 'X'.)

Very Unlikely 1	Unlikely 2	Somewhat Unlikely 3	Neutral 4	Somewhat Likely 5	Likely 6	Very Likely 7

1. Reason:.....

.....

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2.

Please answer the following questions. **At this point, please do not refer back to or change any of your previous answers.**

Please rate how important each of the following **measures** on the balanced scorecard were in your assessment of the success of the strategy at Clever Choice Stores **by allocating 100 points among the four perspectives, allocating more points to perspectives that were more important in your assessment.**

	Measure	Point
Financial measures		
Customer-related measures		
Internal business process measures		
Learning and growth measures		
	Total	100

Before continuing, **please be sure that your four numbers above sum to exactly 100.**

Final questionnaire

At this point, please do not refer back to or change any of your previous answers.

No.	Statement	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1.	To me, financial performance is more important than other measures.							
2.	To me, in BSC, the link between strategy and performance measures is vital.							
3.	I select the strategy and the performance measures.							
4.	I will be blamed if the selected strategy and performance measures do not work out in my organization.							
5.	I know exactly the reasons why I select the strategy and the measures.							
6.	I feel my selection of strategy and measures are important to the company.							

No.	Statement	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
7.	In the balanced scorecard there are cause-and-effect relationships between the four performance categories.							
8.	The new strategic initiative is successful.							
9.	I am responsible for the overall performance of Clever Choice.							
10.	I am responsible for the performance of my regional offices.							
11.	I am responsible for the financial performance of Clever Choice.							
12.	I am responsible for the financial performance of my regional offices.							
	During the experiment...							
13.	...I carefully studied all the information in order to come to a more informed decision.							

No.	Statement	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
14.	...I carefully studied the relationships between the different perspectives.							
15.	...the balanced scorecard directed my attention toward the relationships between perspectives.							
16.	...I carefully studied the direct and indirect effects of the new initiative.							
17.	...I focused on the effects that the new strategy had on internal processes.							
18.	... I focused on the effects that the new strategy had on the financial perspective.							
19.	...I did not notice any variation in customer satisfaction.							
20.	...the training rate was not useful for decision making.							

No.	Statement	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
21.	...I read the manager's report (memo) about the analysis of the new initiative.							
22.	...I understand the potential drawbacks of the new initiative as stated in the manager's report (memo).							
23.	Before I read the manager's report (memo), I have made my decision							
24.	After I read the manager's report, I reevaluate the scorecard							
25.	After I read the manager's report, I reevaluate my decision							
26.	After I read the manager's report, I change my decision							
	About the case							

No.	Statement	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
27.	I have had difficulty in coming to a decision.							
28.	During the study, I felt pressed to make a good decision.							
29.	The decision making process was structured.							
30.	The data that I analyzed were too complex.							
31.	The figure of the balanced scorecard provided in the instructions helped me in my analysis of the performance data.							
32.	The case was easy to understand.							
33.	The case was difficult to do.							
34.	The case was realistic.							
	Additional Comments:							