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Cognitive dissonance and resistance to change: the influence of commitment confirmation and feedback on judgment usefulness of accounting systems[☆]

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Abstract

This study investigates the effects of commitment, confirmation and feedback on people's judgment about the usefulness of costing systems and, in turn, people's resistance to change. Building on the theory of cognitive dissonance, this study predicts that commitment to a particular course of action will cause people to become insensitive to the potential benefits of the rejected alternative. A laboratory experiment was conducted to examine why people are motivated to resist change and what mechanisms they use to rationalize their judgment. Results from the experiment indicated that people's judgments about the usefulness of costing systems were influenced by their commitment to their favored system. People assessed only a subset of their knowledge to support their desired conclusion. Consequently, committed people refused to change their chosen system even when facing negative feedback. In addition, the results confirmed that people normatively know that their judgment should be objective yet they unconsciously make prejudiced judgments biased toward their committed course of action. © 2000 Elsevier Science Ltd. All rights reserved.

1. Introduction

The topic of innovation adoption and resistance to change has inspired voluminous research aimed to explain why new initiatives intended to improve performance of organizations often encounter resistance from people in the organizations. Researchers have studied this phenomena from a variety of perspectives. For example, some researchers have studied organizational factors that influence changes (Cummings & Blumberg, 1987; Kelly & Amburgey, 1991; Moch & Morse,

1977) and the process involved (DiMaggio & Powell, 1983; Knight 1967; Majchrzak, 1988).

Other researchers have focused their investigation on the process of implementing organizational change with issues including how change occurs (DiMaggio & Powell 1983; Kanter 1983), what inhibits it (Dunk, 1989; Foster & Ward, 1994; Libby & Waterhouse, 1995; Ness & Cucuzza, 1995; Tiessen & Waterhouse, 1983), and how to overcome resistance to change (Argyris & Kaplan, 1994; Chao & Koslowski, 1986; Majchrzak, 1988; Nystrom, 1977).

Despite numerous studies about changes and how to implement innovation in organizations, researchers have found that the potential advantages of new initiatives are often not fully realized.

[☆] Instrument of the experiment is available upon request from the author

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In his survey of US firms, Majchrzak (1988) reported that the failure rate when implementing advanced manufacturing technology for US firms is about 50%. Besides economic and technical constraints, it has been repeatedly reported that individual factors play an important role in the successful adoption of new initiatives. The introduction of new initiatives can be seen as a threat by middle management and employees (Nadler & Robinson, 1987). Individual resistance to change has been found as a major factor that prevents companies from fully realizing the advantages of new initiatives (Argyris & Kaplan, 1994; Sullivan & Smith, 1993).

Automation and technology improvements have caused significant changes in the cost structures of today's companies. Hardy and Hubbard (1993), for example, report that in many companies, direct labor, which used to constitute 40 to 60% of the total cost of a product, has decreased to five percent or less. Indirect costs, on the other hand, have significantly increased and may account for 50% or more of the total cost. Traditional costing systems that usually use direct labor as a base for allocating indirect costs, do not reflect these changes. Activity-based costing (ABC) improves the accuracy of product costing by more accurately tracing the cost of the activities to products.

ABC is considered one of the best tools for refining the traditional costing systems (Horngren, Foster, Datar & Teall, 2000). ABC enhances the accuracy of product cost information by assigning costs based on the most direct causal factors that consume the resources. Consequently, one would expect that many companies would use ABC to improve the accuracy of their product cost information. Empirical studies have shown, however, that ABC is not widely applied in practice (Armitage & Nicholson, 1993; Innes & Mitchell, 1994; Malmi, 1999). Researchers (e.g. Argyris & Kaplan, 1994; Ness & Cucuzza, 1995; Sullivan & Smith, 1993) found that even after ABC revealed new insights about the relative cost and profitability of activities, managers often resist to change their costing systems.

The lack of innovation in management accounting has been studied extensively. Dunk (1989), for example, argues that one reason for the

lack of innovation in management accounting is that the potential benefits of accounting innovations are less tangible than technical innovations. Other researchers use the argument of internal labor markets to explain this phenomenon. Tieszen & Waterhouse (1983) argue that management accounting systems are an integral part of internal labor markets because the systems provide the method for performance evaluation and histories. Therefore, people will value the rigidity (or the stability) of the systems. Frequently changing these rules and conventions would decrease the credibility of the accounting measures and the internal labor market. Consequently, a stable management accounting system produces benefits to internal labor market participants (see also Foster & Ward, 1994).

The existing literature on changes in management accounting, however, has focused their investigations on the organizational factors. Few, if any, studies have looked at resistance to change at the individual level. While studies about resistance to change at organizational level have provided some insights into factors that inhibit change at the organizational level, researchers have found that a major stumbling block for implementing new initiatives in management accounting is the rejection at the individual level. In a series of field studies, Kreitner and Luthans (1991) and Latham and Locke (1991) found that new initiatives, no matter how compelling, were often resisted by people even though the new initiatives had been approved at the organizational level.

The study reported here is designed to investigate the mechanisms underlying the motivation to resist change and the impact of cognitive dissonance on people's judgments about new initiatives. The study predicts that commitment to a particular course of action will cause people to become insensitive to the potential benefits of the rejected alternative. Consequently, commitment will result in high inertia. The study also examines the extent to which cognitive dissonance is mitigated by feedback.

Examining these issues is important for several reasons. First, organizations' resistance to change has been associated with declining competitiveness and people's resistance to change is often a major

factor for not changing to new initiatives (e.g. Argyris & Kaplan, 1994; Sullivan & Smith, 1993). Understanding people's motivation to resist change is important in trying to reduce their inertia. Second, in management accounting literature, feedback is considered as an effective tool to promote exploration of alternative ways to improve future actions (e.g. Garrison, Noreen, Chesley & Carroll, 1999; Horngren et al., 2000). In contrast, this study indicates that when people experience cognitive dissonance, they tend to ignore feedback about their past performance. Specifically, this study demonstrates that when people are committed to a particular costing systems, they tend to ignore the feedback about the inaccuracy of product cost information generated from the traditional costing system. The results provide new insights into the role of feedback for future actions.

From an accounting perspective, this study demonstrates significant cognitive dissonance effects on judgment about the usefulness of accounting systems and on willingness to change the existing accounting system. These effects are not mitigated by feedback. The study also adds to the psychological literature because it provides insights into the cognitive effects of feedback based on a relative performance measurement in a competitive environment.

The rest of this paper proceeds as follows. The next section contains a review of the related literature, the model used, and the hypotheses tested. The research method is then described, followed by the results. The final section presents a discussion of the major findings, the limitations, and the implications for future research and practice.

2. Background theory and hypotheses

Behavioral researchers have given much attention to the descriptive model of the interaction between people's beliefs and their reactions to new information that challenges those beliefs (e.g. Aronson, 1968; Festinger, 1957; Geller & Pitz, 1968; Kahneman & Tversky, 1982; Koehler, 1993; Kunda, 1990; Soelberg, 1967). The theory of cognitive dissonance, first introduced by Leon Festinger in 1957 and reformulated by Elliot Aronson in

1968, for example proposes that people attempt to appear reasonable to themselves and to others. That is, they need to ensure that their behavior is consistent with their attitude toward an event. When they find themselves acting in a way that is inconsistent with their attitude (i.e. why they experience cognitive dissonance), they experience tension and attempt to reduce this tension and return a state of cognitive consistency. Dissonance occurs whenever one simultaneously holds two inconsistent cognition (ideas, beliefs, opinions).

Festinger (1957) argued that the state of inconsistency is so uncomfortable that people strive to reduce the conflict the easiest way possible by changing one or both cognition so that they will fit together better. According to this theory, there are two major ways in which people can reduce cognitive dissonance. First, people may persuade themselves that the rejected alternative is really much less attractive than first perceived and that the unattractive attributes of the selected alternative were really not unattractive. Second, people can also provide additional justification for their choice by exaggerating the attractiveness of the chosen alternative and the unattractiveness of the rejected alternative. In other words, according to the theory, the process of dissonance reduction should lead to an increase in the desirability of the chosen alternative and a decrease in the desirability of the rejected alternative.

There is a growing literature in accounting on justification, accountability and how people's beliefs influence their judgment (e.g. Brown, Peecher & Solomon, 1999; Hirst, Koonce & Simko, 1995; Kennedy, 1995; Peecher 1996; Tan, 1995). Brown et al., for example, found that auditors are confirmation prone. They accept information that support their hypotheses at face value but scrutinize hypercritically information that discredit their hypothesis. In a similar vein, Peecher reported that auditors tend to seek self-confirmatory cues in performing their audit task which affect audit effectiveness and efficiency.

Prior studies have also examined how people's beliefs affect how they interpret information. Kennedy, Kleinmuntz and Peecher (1997), for example, investigated how justifiability is influenced by the interaction between auditors' preliminary

decisions and the advice obtained from non-binding consultants. They found that justifiability was greatest when the advice agree with the auditors' preliminary decisions. Salterio and Koonce (1997) provided similar results. They found that in an ill-structured audit task, auditors rely to a greater extent on precedents that are similar to the accounting issues in questions. When all the precedents suggested the same accounting treatment, auditors tended to follow the precedents and ignore the client's position. On the other hand, when the available precedents were mixed, auditors tended to follow the client's position.

Hackenbrack and Nelson (1996) and Cuccia, Hackenbrack and Nelson (1995) provided evidence concerning the effects of auditors' and tax practitioners' conflicting incentives on their judgment about vague accounting standards. They found that auditors' and tax practitioners' incentives influenced their reporting decisions by the extent to which their incentives favor aggressive (when the engagement risk was moderate) versus conservative (when the engagement risk was high). Some studies (e.g. Brown et al., 1999; Kennedy, 1995) have investigated several debiasing mechanisms such as accountability, experience, and truth-searching incentives with inconclusive results.

The theory of cognitive dissonance provides discerning and testable hypotheses of why people are influenced by their prior beliefs and why they are motivated to resist change. Aronson (1968) defined cognitive dissonance as "a negative drive state which occurs whenever an individual simultaneously holds two cognition (ideas, beliefs, opinions) which are psychologically inconsistent." Festinger (1957) provided some reasons why dissonance almost always exists after making a decision:

The cognitive elements corresponding to positive characteristics of the rejected alternatives, and those corresponding to negative characteristics of the chosen alternative, are dissonant with the knowledge of the action that has been taken (p. 261).

The notion that free choice is necessary for dissonance to occur has been known for some time (Allen, 1964; Cooper & Fazio, 1984; Davis &

Jones, 1960; Linder, Cooper, & Jones, 1967) while the importance of public commitment was pointed out by Cooper and Fazio:

...making a statement contrary to one's attitude while in solitude does not have the potential for bringing about an aversive event.for example, if individuals were to speak quietly in the confines of their bedroom, would making a counterattitudinal speech arouse dissonance and result in cognitive changes? (p. 232).

The link between cognitive dissonance theory and the study of resistance to change focuses on the concepts of choice and commitment. Allen (1964) demonstrated that post-decision dissonance (after people choose a certain course of action) occurs when the possibility of obtaining all choices is removed. Participants in his experiment rated the unchosen alternative significantly lower than their initial ratings when the possibility of obtaining both alternatives was impossible. Relating this to management's resistance to adopt new initiatives, it is hypothesized that dissonance will not occur until management understand that, by choosing a particular system, the alternative system is no longer available and management are, in effect, committed to the chosen alternative. Dissonance theory predicts that when management are committed to their chosen system, they will become insensitive to the attractive features of the alternative system. Management will exaggerate the usefulness of their chosen system and downgrade the usefulness of the alternative system, which, in turn, will cause them to be more reluctant to change their existing system than those who do not make such a commitment.

In the context of product costing system, cognitive dissonance phenomenon has been witnessed when an alternative product costing system is introduced. When decision makers are confronted with evidence that the existing costing system produces distorted cost information, they can either change their attitude about the existing system or change the costing system. Since the former might be easier, it is not surprising that decision makers try to rationalize their behavior toward the

existing system. For example, they might assert that they do not need accurate product cost information since they can learn from their competitors in making product-related decisions. Or they may argue that the claim about the benefit of an alternative costing system is made by those who are selling some types of products related to the alternative costing system such as consulting service, seminars, and software. Based on their experiences in introducing ABC into organizations, Argyris and Kaplan (1994) asserted that even after the ABC model revealed new insight about the relative cost and profitability of activities, senior operating managers were reluctant to act upon this information.

Resistance to change has been observed when introducing new initiatives in management accounting. In light of rapid and accelerating changes in production systems, manufacturing technology, and particularly the enormous innovation in information processing, one would expect to see significant changes in management accounting systems to provide relevant and timely information demanded by today's managers. In fact, however, management accounting systems, particularly costing systems have been slow to change. As a result, it is alleged that these costing systems often provide information that is too late, too distorted, and too aggregated to be relevant for management decision making in today's business environment (Brimson, 1991; Johnson & Kaplan, 1987).

Researchers, as well as practitioners, have criticized traditional costing systems and have argued that these systems contribute to the problem rather than becoming part of the solution to the declining competitiveness in North American Industry. Traditional costing systems provides misleading information about companies' competitive opportunities and contribute to the suboptimal performance of the companies (Elliot, 1992; Malmi, 1999; Shank & Govindarajan, 1989).

2.1. *The model*

ABC provides an interesting setting to study resistance to change in a management accounting context. While traditional costing systems have been criticized for providing misleading information about companies' competitive opportunities, ABC

(developed to improve the accuracy of product cost information) has faced the same resistance as that experienced by other new initiatives intended to improve organizational performance (Argyris & Kaplan, 1994). A controversy surrounding the relative usefulness of traditional versus ABC systems is used, in a laboratory setting, to study how commitment influences people's judgment and their willingness to change.

Although experimental methods typically lack of naturally-occurring contexts, these methods allow manipulation of the variables of interest and control of the variables not of interest. For example, in this study, subjects' prior beliefs (favor ABC or TCS), level of commitment (commitment or no commitment), and type of feedback (negative or positive) were manipulated while the format of the presentation and subjects' prior knowledge to the controversy were controlled. Controlling subjects' prior knowledge was particularly important given the nature of the information presented in the summary pages that was biased toward a particular costing system. Prior knowledge about the controversy might interact in some way with subjects' judgment about a particular costing systems. Experimental methods also allow researchers to investigate issues that are difficult to obtain from the naturally-occurring contexts. For example, this study investigates the influence of commitment to ABC on judgment and inertia. Since ABC is not widely accepted by companies, it would be difficult for researchers to obtain subjects with prior beliefs in ABC.

The model to depict the effects of commitment, confirmation, and feedback on people's judgment and resistance to change is shown in Fig. 1.

The model shows that people will reveal their prior beliefs to a costing system by choosing their preferred system (i.e. either TCS or ABC). Once a costing system is chosen people will suffer dissonance due to information about the attractive features of the rejected alternative. People then engage in dissonance reduction processes to restore the state of consistency. People will seek information which confirms that their chosen system is superior to the rejected system and will ignore information which disconfirms the superiority of their chosen system. The outcome of the dissonance reduction processes will be reflected in

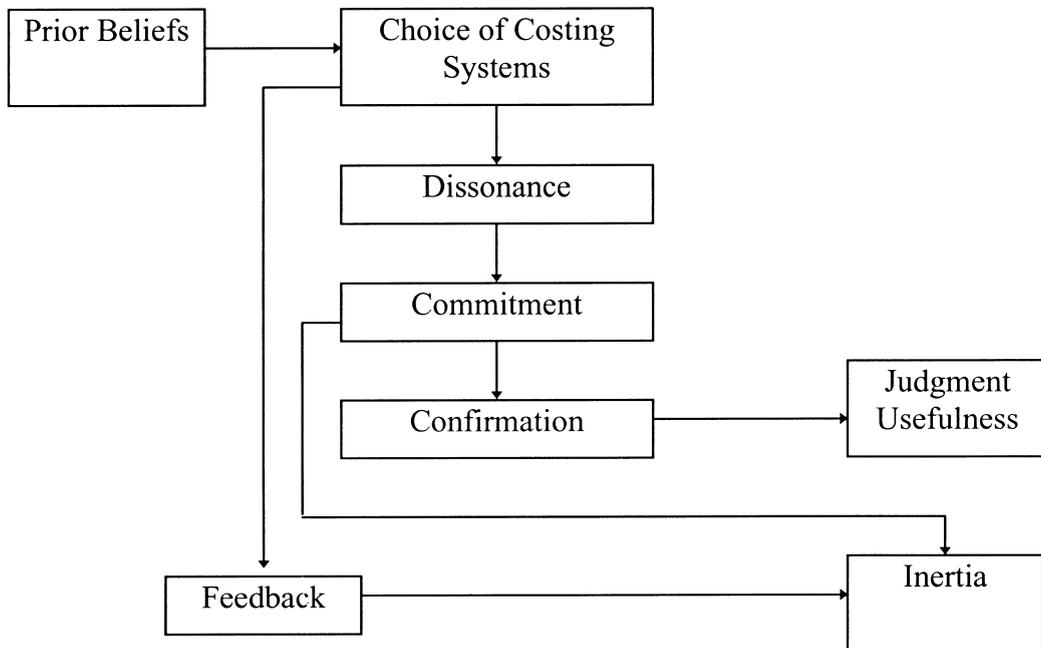


Fig. 1. The model for testing the effects of commitment to prior beliefs, confirmation and feedback on people's judgment and resistance to change. (This model is partially based on Foran and DeCoster, 1974).

judgments of usefulness of the costing system. That is, participants who experience dissonance (those who freely choose a costing system and make their choice known publicly) will increase the desirability of the chosen alternative and decrease the desirability of the rejected alternative. The model is also intended to investigate the interaction between participants' prior beliefs and feedback on their inertia (resistance to change). Researchers have long been puzzled by the fact that new initiatives intended to improve companies performance often encounter resistance by people who are directly affected by the change. The logic behind this puzzle is straight forward. If new initiatives increase the companies' well-being, people will accept, and even work hard, to implement the new initiatives. However, people's resistance to change is usually observed in practice.

2.2. Hypotheses

2.2.1. Judgment usefulness

Dissonance theory argues that people's estimates of the state of the world are not independent of

their own state of beliefs. People's reaction to new information is biased towards their preferences of their prior beliefs. Mahoney (1977) called this phenomenon "confirmatory bias" — the tendency to emphasize and believe information that supports one's views and to ignore or discredit evidence that does not. Researchers (e.g. Koehler, 1993; Mahoney Sanbonmatsu, Akimoto & Biggs, 1993; Swann & Read, 1982) found that people's subsequent decisions are very much influenced by their initial beliefs. To reduce their cognitive dissonance, people try to seek information that is consistent with their prior beliefs. Consequently, belief-confirming information will be weighted more favorably than belief-disconfirming information.

In a similar vein, Tetlock, Skitka & Boettger (1989) tested the hypothesis of how accountability (through public commitment) affects people's behavior. In one experiment, participants were asked to explain and justify their opinions publicly. They found that when people are committed publicly to a certain position, they will devote the majority of their mental effort to justifying that position (defensive bolstering).

Based on the prior research, it is expected that people's judgments about the usefulness of a costing system will be influenced by their commitment to their choice and also by whether the system to be judged confirm or disconfirm their favored system. The alternative hypotheses are presented below.

H_{a1}: Confirmation will result in higher judged usefulness than non-confirmation.

H_{a2}: The difference in judged usefulness given by committed and non-committed people will vary depending upon the confirmation effect. Committed people will give higher (lower) ratings to the usefulness of a costing system that confirm (disconfirm) their favored system than non-committed people.

H_{a3}: Commitment will result in higher (lower) judged usefulness for the favored (alternative) system.

2.2.2. *Inertia (resistance to change)*

One implication of the theory of cognitive dissonance concerns information-seeking activities. If dissonance exists, people seek out information that reduces dissonance and avoids information that increases dissonance. Therefore, after making a decision, people expose themselves to information that supports the choice they made and avoid exposure to information that would indicate that their choice was incorrect. Pitz (1969), for example, found that subjects are reluctant to reduce their confidence in a decision following disconfirming information (negative feedback). Researchers (e.g. Kruglanski, Webster & Klem, 1993; Mahoney, 1977; Swann & Read, 1981) argued that people's commitment to their initial beliefs often make them insensitive to the potential benefits of the new initiatives. Other researchers (e.g. Foran & DeCoster 1974; Tiller, 1983) found that subjects' commitment to their chosen alternative significantly increases following confirming information (positive feedback).

The tendency of people to ignore feedback that disagrees with their chosen alternative indicates that those people are influenced by their prior beliefs when evaluating feedback. Swann and Read (1981) found that people tend to search for

self-confirmatory feedback (positive feedback) and ignore or scrutinize self-disconfirmatory feedback (negative feedback) hypercritically. Choosing a bad option (i.e. receive negative feedback) is inconsistent with the decision makers self-image as a smart and capable person. Consequently, the theory of cognitive dissonance predicts that information that conflicts with this image (i.e. negative feedback) tends to be ignored or rejected.

Building on the theory of cognitive dissonance, it is predicted that people who are committed to their chosen system (the experimental group) will be more resistant to change to an alternative costing system than those without such a commitment (the control group) regardless of the feedback that they receive from the existing costing system. For the control group, it is predicted that when facing negative feedback, people will be more willing to change to an alternative costing system. To investigate this issue, the following hypotheses will be examined (presented in the form of alternative hypotheses):

H_{a4}: Inertia will be higher when people are committed rather than assigned to a costing system.

H_{a5}: When people get positive feedback they see little reason for change, but when they get negative feedback they are under pressure to change.

H_{a6}: The difference in the inertia level between committed and non-committed people will be higher when people receive negative feedback than when they receive positive feedback.

2.2.3. *Perceived objectivity*

The theory of cognitive dissonance proposes that people are unaware that their judgments are influenced by their prior beliefs. People do not realize that they are using only a subset of their relevant knowledge not realizing that they also possess knowledge that could be used to support the opposite conclusion. To examine this issue, the following hypotheses will be tested.

H_{a7}: People will not admit that their assessment of the usefulness of the costing systems are influenced by their commitment to a chosen system.

H_{8a}: People will agree that managers should be objective in their assessment of the usefulness of a costing system.

3. Research method

3.1. Research design

A laboratory experiment was conducted to investigate the effects of people's commitment to their prior beliefs, confirmation, and feedback on people's resistance to change. There were two groups in the experiment, commitment (experimental) and no-commitment (control) groups. Each group consisted of two subgroups, TCS and ABC. Participants were randomly assigned into one of the four subgroups based on the costing system favored in the materials that participants read. Participants in the TCS experimental group were matched with those in the TCS control group. The same procedure were used for those in the ABC groups.

Participants' commitment to a particular system was induced by asking them to formally choose a costing system and by asking them to provide specific reasons for why they chose the system. This choice was made after participants read a brief description of both TCS and ABC. The confirmation effect was manipulated by asking each participant to evaluate the usefulness of both the favored system (confirm) and the alternative system (disconfirm).¹

This experiment consists of two stages: pre-feedback and post-feedback. The first stage (pre-feedback) investigates the effect of people's commitment to their prior beliefs and confirmation on people's judgment about the usefulness² of the costing sys-

tems. The design of the experiment in this first stage is a 2×2 Mixed ANOVA design with one between-subject and one within-subject factors. The two factors (independent variables) are commitment and confirmation (whether the system to be evaluated confirms/disconfirms the usefulness of the system favored in the summary pages). Commitment is the between-subject factor while the Confirmation is the within-subject factor. The dependent variable is judgment about the usefulness of costing systems and was measured by responses to seven statements for each costing system (Table 2, Panel A). Responses to these 14 statements were combined into two constructs: confirmation (if the statements confirmed the usefulness of the favored system) and disconfirmation (if the statements disconfirmed the usefulness of the favored system). In this case, participants' response to the seven statements that confirmed the usefulness of the favored system was collapsed across statements to represent the confirmation construct. The same process was performed for the disconfirmation construct. The Cronbach's Alphas were 0.83 and 0.85 for the confirmation and disconfirmation constructs, respectively. These results indicate that the reliability of the constructs are within the acceptable range. The design of this experiment is shown in Table 1 (Panel A).

In the second stage (post-feedback), this study investigates the effect of commitment to prior beliefs and feedback on people's resistance to change. The design of the experiment in the second stage is a 2×2 factorial design. The two factors

Table 1

(A) Experimental design to test the influence of commitment and confirmation on people's judgment; (B) Experimental design to test the influence of commitment and feedback on people's resistance to change

Commitment		Commitment	No commitment
A.			
Confirmation	Confirm	Cell 1	Cell 2
	Disconfirm	Cell 3	Cell 4
B.			
Feedback	Positive	Cell 1	Cell 2
	Negative	Cell 3	Cell 4

¹ Research on confirmatory bias suggests that after people make their choice, the attractive features (i.e. the usefulness) of the favoured system will be perceived as a confirmation that they have made a good choice. On the other hand, the attractive features of the alternative (or rejected) system will be perceived as a disconfirmation about the goodness of their choice.

² For the purpose of this study, the usefulness of a costing system is defined as the attractive features of the costing systems to be evaluated.

(independent variables) are commitment and feedback. Commitment has two levels: commitment (the experimental group) and no commitment (the control group). Feedback has two levels: positive and negative. The dependent variable is inertia (people's resistance to change their beliefs in the existing system). The inertia was measured by responses to five statements (Table 2, Panel B). Responses to these five statements were combined into one construct, inertia (resistance to change). In this case, participants' response to the five statements was collapsed across statements to represent the inertia construct. The Cronbach's alpha was 0.91 for the inertia construct. This

result indicates a high reliability of the inertia measures. The design of this experiment is shown in Table 1 (Panel B).

3.2. Participants

First year students registered in an introductory accounting course at the University of Waterloo were recruited to take part in this study. Participants were volunteers and they were told that they could discontinue the experiment at any time without penalty. Participants were told that they were going to participate in a study about individuals' attitude toward management accounting. A

Table 2
Experimental questionnaire

Panel A: Judgment about the usefulness of the costing system (each statement was evaluated based on the scale of 1 to 7 where, 1 = not useful; 7 = very useful)

A. The usefulness of SCS:

1. SCS is a useful costing system because it is simple.
2. The fact that SCS is commonly used by companies indicates that this system provides useful information for managers in making decisions.
3. SCS is more efficient system since information used to calculate product costs using SCS is already available in the accounting system.
4. SCS is a useful system since it is consistent with the requirement of external reporting.
5. SCS helps companies to control their indirect costs by making department managers responsible for the costs incurred in their department.
6. How good is SCS in providing accurate product cost information
7. How strongly would you recommend SCS to companies

B. The usefulness of FCS:

1. FCS is a useful costing system because it uses multiple cost drivers to allocate costs to products.
2. FCS helps companies compete by providing managers with more accurate product cost information.
3. FCS helps companies to be more profitable because it provides a more accurate profit number for each product.
4. Since FCS allocates indirect cost based on the activities required to produce the products, FCS helps management to be more competitive in the marketplace by enabling companies to eliminate non-value added activities.
5. FCS helps management in making better product-related decisions, such as product pricing, and product discontinuation.
6. How good is FCS in providing accurate product cost information?
7. How strongly would you recommend FCS to companies?

Panel B: Inertia (resistance to change) (each statement was evaluated based on the scales of 1 to 7 where, 1 = high inertia; 7 = low inertia).

1. How satisfied are you with the product cost information provided by your chosen system?
2. How concerned are you about more accurate information being provided by the other system?
3. What chance of success do you think your chosen system has of providing accurate product cost information in the future?
4. If given the opportunity, do you believe that you can make a greater profit than companies' average profit using information provided by your chosen system?
5. If given the opportunity, to what degree would you like to change your chosen costing system to provide data more consistent with the alternative system (i.e. if you are currently using SCS, to what degree would you like to change to FCS or vice versa)?

total of 89 students participated in the experiment (this number excludes those in the pilot study).³ Seven responses were not usable due to unsuccessful manipulation of participants' prior beliefs (six responses) and due to illness (one response). This reduced the usable cases to 82.

Participants were purposely solicited from introductory sections of an accounting course. Students registered in this course had some accounting knowledge necessary to understand the experimental materials but had not yet been exposed to the issues being studied (i.e. the controversy between traditional costing systems and ABC). It was important that participants did not have prior knowledge about the experimental materials since prior knowledge about the issues being studied might influence the way they responded to the experimental tasks.

Participants learned about the traditional costing system and ABC from the description of the two costing systems provided in the experimental materials. Understanding the experimental materials was important for participants since they had to use their chosen system to compute their product costs and selling prices according to the information outlined in the experimental materials. Inaccurate calculations of product costs and selling prices would affect participants' profit and, in turn, their reward.

3.3. *The experimental materials and procedures*

The experimental materials consisted of 14- and 17-page booklet that explained the controversy surrounding the relative usefulness of traditional versus activity-based costing systems. The booklets contained instructions, background information about the two costing systems, and a series of

questions about the usefulness of both systems, the degree of satisfaction with the existing system, and the willingness to adopt the alternative system.

Participants were randomly assigned to one of four groups, two experimental and two control groups. Each experimental group was matched with one control group. Members of one matched pair read a two-page summary that favored the traditional costing system [(TCS), disguised in the experimental materials as structural costing system (SCS)] while members of the other matched pair read a two-page summary that favored ABC [disguised in the experimental materials as functional costing system (FCS)]. Participants in the experimental groups were asked to indicate their belief and subsequently to choose either TCS or ABC and provide arguments for their choice. Participants in the control groups were not asked to do this. Participants were then asked to evaluate the usefulness of both systems.

After participants completed their evaluation of the usefulness of both accounting systems, they were asked to play the role of a manager of a company. They were informed that their company produces three separate products: product A, product B, and product C. Participants were given product cost information according to their chosen system (for the experimental group) or the assigned system (for the control group) and were asked to post the selling price of each product. They were told that the prices that they post would be compared to the market prices determined in the previous period. If their posted price was equal to or below the market price, they would sell one unit of the product, and the profit would be calculated as the difference between the posted selling price and the product cost. On the other hand, if their posted price was above the market price, they would sell zero units. Their total profit from the three products was compared to the average profits from all companies in the previous period. They were told that they would receive a \$5 bonus if their total profit was equal to or greater than the average profit made by the companies in the previous period (positive feedback). Otherwise, they would receive negative feedback and not get the bonus.

³ Two pilot studies were conducted. The first study used four students (one in each cell). The primary purpose of this study was to investigate the degree of understanding of the experimental materials. As a result of this first study, a change was made to simplify the experimental materials. The second study used 16 students (four in each cell). The purpose was to obtain preliminary results related to the hypotheses developed in this study and to investigate any changes necessary before the final experiment.

In the experiment, however, positive or negative feedback was randomly given to participants irrespective of their performance. Thus, the market prices and the average companies' profit from the previous period were manipulated for feedback purposes only. Because of this procedure, all participants receive the bonus.

After participants received the feedback, they were asked to indicate their degree of satisfaction with their existing system and their willingness to adopt the alternative system for continued use in subsequent periods. Participants were also asked to complete a post experimental questionnaire and demographic information.

4. Data analysis and results

4.1. Manipulation checks

The manipulation of participants' prior beliefs in either TCS or ABC was assessed by participants' responses to two statements. The first was "Do you believe that TCS (or ABC) is an appropriate product costing system to allocate costs to products?" The second was "Choose a system for calculating your product costs." Participants responded to these two statements by circling either "Yes" or "No" and either "TCS" or "ABC", respectively.

A manipulation check showed that participants' prior beliefs were successfully manipulated (a successful manipulation is defined as a probabilistic report by participants that indicates that they held a belief in the direction favored by the summary pages). The results showed that 42 of 48 (87.5%) participants in the experimental groups chose the costing system intended in the summary pages.⁴ In addition, a comprehension check revealed that participants understood the experimental material

reasonably well (mean = 79% and standard deviation = 6.38).

4.2. Descriptive statistics

Table 3 reported the descriptive statistics for judgment usefulness of costing systems (Panel A) and inertia (Panel B) in each experimental condition. As predicted, committed people gave higher ratings to the statements that confirmed the usefulness of the favored system than those of the no commitment ($M_{\text{com}} = 6.15$ and $M_{\text{noncom}} = 5.33$).⁵ In contrast, when the statements disconfirmed the usefulness of the favored system, committed people gave lower ratings than those of the no commitment ($M_{\text{com}} = 3.46$ and $M_{\text{noncom}} = 4.64$). These results are shown graphically in Fig. 2 (Panel A).

Moreover, participants who were committed to a particular system showed higher inertia than those who did not make such commitment regardless of the feedback that they received ($M_{\text{com}} = 5.23$ and $M_{\text{noncom}} = 4.52$ when they received positive feedback) and ($M_{\text{com}} = 5.19$ and $M_{\text{noncom}} = 1.91$ when they received negative feedback). These results are shown graphically in Fig. 2 (Panel B).

4.3. Hypothesis testing

4.3.1. Judgment about the usefulness of a costing system

A 2×2 mixed ANOVA was performed to test the hypotheses about the influence of people's commitment to their prior beliefs and confirmation of their judgment about the usefulness of a costing system. The results of this test are presented in Table 4 (Panel A).

⁴ A further investigation was conducted for the six unsuccessful manipulations. This investigation revealed that one particular did not agree with the argument made in the experimental materials while five participants were not consistent in their responses. As a result, these six responses (and one incomplete response due to illness) were excluded from further analyses.

⁵ T-tests were performed to investigate whether the TCS and ABC matched pairs are homogeneous. Responses from no commitment 1(TCS) were compared to those of no commitment 2. The same procedure was also performed for the two commitment groups. These tests revealed that the matched pairs are not different. As a result, for further analyses (hypothesis testing) two matched pairs (four groups) were combined into two groups: commitment (experimental) and no commitment (control) groups.

4.3.2. Hypothesis one (H_{a1}): confirmation main effect

The first hypothesis predicted that confirmation would result in higher judged usefulness than non-confirmation. Table 4 (Panel A) showed a significant confirmation main effect, $F(1,78) = 171.98$, $P < 0.001$. People gave higher ratings to the statements that confirmed the usefulness of the favored system than to those that disconfirmed the usefulness of the favored system (i.e. the usefulness of the alternative system). This result was consistent with hypothesis H_{a1} .

4.3.3. Hypothesis two (H_{a2}): commitment by confirmation interaction effect

The second hypothesis expected that the difference in judged usefulness given by committed and non-committed people would vary depending upon the confirmation effect. The results showed a significant commitment by confirmation interaction effect, $F(1,78) = 60.38$, $P < 0.001$. Committed people gave higher ratings to the statements that confirmed the usefulness of the favored system than those in the control group. Committed people also gave lower ratings to the statements that disconfirmed the usefulness of the favored system than those in the control group. The result was consistent with hypothesis H_{a2} .

4.3.4. Hypothesis three (H_{a3}): simple effects

The third hypothesis stated that commitment would result in higher (lower) judged usefulness for the favored (alternative) system. The results indicated that committed people gave higher (lower) ratings to the statements that confirmed (disconfirmed) the usefulness of the favored system than the non-committed people, $F(1,78) = 35.43$, $P < 0.01$ and $[F(1,78) = 28.27$, $P < 0.01)$. This result was consistent with hypothesis H_{a3} .

An unexpected marginally significant main effect for commitment was also found, $F(1,78) = 3.77$, $P < 0.06$. Committed people tended to rate the usefulness of the two costing systems higher than non-committed participants. It may be that for the committed people, exaggerating the usefulness of their chosen system is easier than downgrading the alternative system. No hypothesis was made about commitment main effect because of the inability to predict the direction of the hypothesis. It was expected that the commitment main effect would not be significant due to a significant interaction effect. That is, when summing across (or averaging across) confirmation and disconfirmation effects, there would be no difference between commitment and no commitment.

4.3.4.1. Inertia (resistance to change). A 2×2 factorial ANOVA was performed to test the hypotheses about the effect of commitment and feedback on people's resistance to change. The two factors are commitment and feedback. Commitment has two levels: commitment and no commitment. Feedback has two levels: positive and negative. The results of this test are presented in Table 4 Panel B.

4.3.5. Hypothesis four (H_{a4}): commitment main effect

The fourth hypothesis postulated that inertia would be higher when people are committed rather than assigned to a costing system. Table 4 (Panel B) showed a significant commitment main effect, $F(1,78) = 99.01$, $P < 0.001$. Committed people showed higher inertia than non-committed people. This result was consistent with hypothesis H_{a4} .

Table 3

Descriptive statistics: (A) mean (standard deviation) of judgment about the usefulness of costing systems by experimental condition; (B) mean (standard deviation) of inertia by experimental condition

Commitment		Commitment	No commitment
A.			
Confirmation	Confirm	6.15 (0.53) <i>n</i> = 42	5.33 (0.66) <i>n</i> = 40
	Disconfirm	3.46 (0.74) <i>n</i> = 42	4.64 (0.90) <i>n</i> = 40
B.			
Feedback	Positive	5.23 (0.72) <i>n</i> = 21	4.52 (1.18) <i>n</i> = 20
	Negative	5.19 (0.92) <i>n</i> = 21	1.91 (0.74) <i>n</i> = 20

4.3.6. Hypothesis five (H_{a5}): feedback main effect

The fifth hypothesis stated that when people get positive feedback they see little reason for change, but when they get negative feedback they are under pressure to change. A significant feedback main effect was found, $F(1,78) = 41.61, P < 0.001$. People were more reluctant to change when they received positive feedback than when they received negative feedback. This result was consistent with hypothesis H_{a5} .

4.3.7. Hypothesis six (H_{a6}): commitment by feedback interaction

The sixth hypothesis expected that the difference in the inertia between committed and non-committed people would vary depending upon the feedback that they receive. Table 4 (Panel B) also showed a significant commitment by interaction effect, $F(1,78) = 41.16, P < 0.001$. The difference in the inertia between committed and non-committed people was greater when people received negative

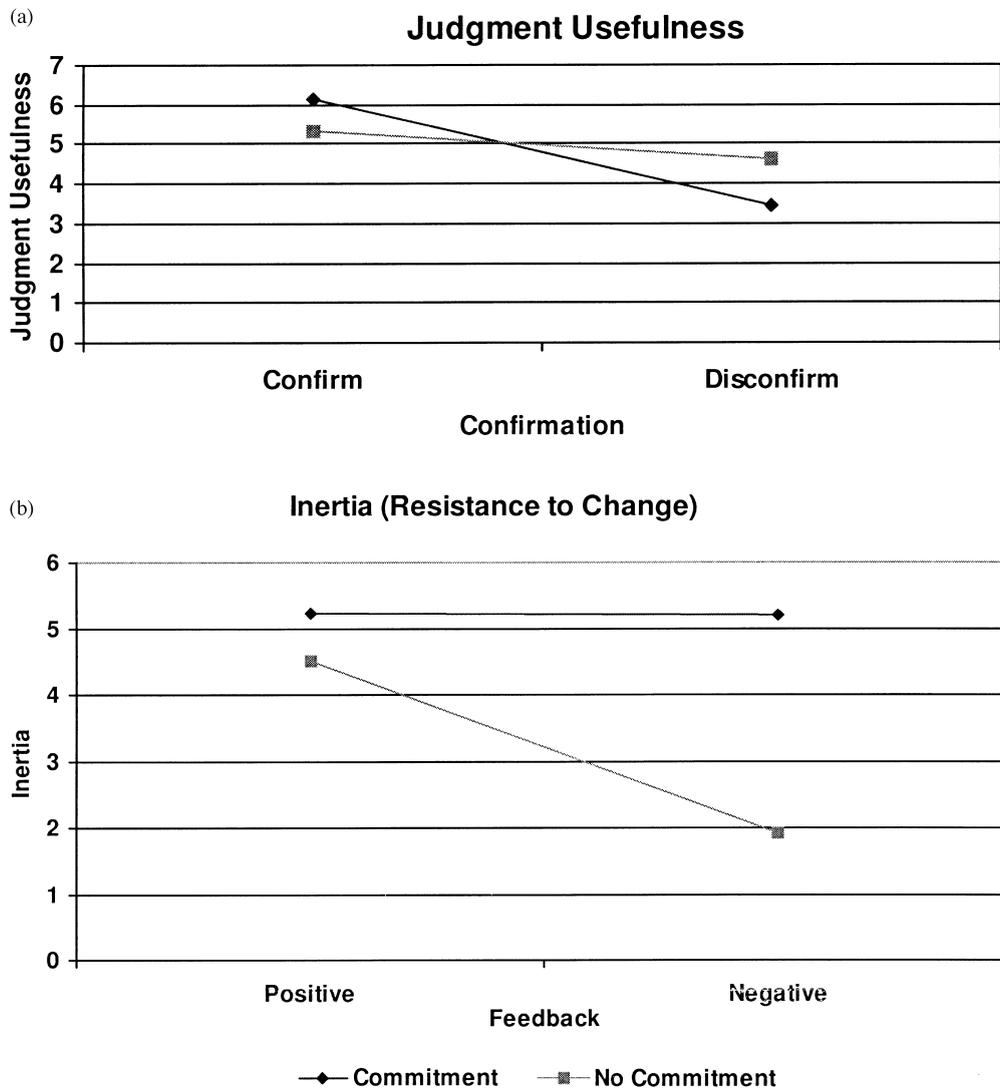


Fig. 2. (A) Results of the influence of commitment and confirmation on people’s judgment; (B) Results of the influence of commitment and feedback on people’s inertia.

Table 4

(A) Mixed ANOVA results: judgment about the usefulness of a costing system; (B) Factorial ANOVA results: inertia (resistance to change)

Source	SS	DF	M.S.	F-ratio	P-value
Commitment	1.35	1	1.35	3.77	0.056
Confirmation	117.25	1	117.25	171.98	0.000
Commitment by confirmation	41.16	1	41.16	60.38	0.000
Commitment	81.50	1	81.50	99.01	0.000
Feedback	34.26	1	34.26	41.61	0.000
Commitment by feedback	33.88	1	33.88	41.16	0.000

feedback than when they received positive feedback. This result confirmed hypothesis H_{a6}.

4.3.7.1. Perceived objectivity. People's perceived objectivity was assessed by their responses to two statements (using a seven point Lykert-type scales with 1 = strongly disagree and 7 = strongly agree). The first was "My evaluation of the usefulness of the two costing systems was *not* influenced by the choice that I have made to a particular system." The second was "In general, managers' evaluation of the two costing systems *should not* depend upon the choice that they have made to a particular system." A chi-square test was performed to investigate the differences in participants' perceived objectivity. Participants' scores were transformed into categorical variables in which scores < 4 were categorized as disagree and scores > 4 were categorized as agree with the two statements mentioned above. Scores = 4 were excluded from the analysis since these scores indicate no preference for either category. The chi-square contingency table is presented in Table 5.

4.3.8. Hypotheses seven and eight

The seventh hypotheses predicted that people would not admit that their assessment of the usefulness of the costing systems was influenced by their commitment to a chosen system. The eighth hypothesis predicted that people would agree that managers should be objective in their assessment of the usefulness of a costing system.

Table 5

Chi-square contingency table

Hypotheses	H _{a7}		H _{a8}	
	Agree	Disagree	Agree	Disagree
Observed frequencies	26	11	30	5
Expected frequencies	18.5	18.5	17.5	17.5

The results showed in Table 4 revealed that participants in the experimental groups did not realize that their judgments were influenced by their commitment to their chosen alternative (Mean = 4.83, $\chi^2 = 6.01$ $P < 0.05$) and they also agreed that managers should be objective in their assessment of given information (Mean = 5.38, $\chi^2 = 17.86$ $P < 0.001$). These results were consistent with hypotheses H_{a7} and H_{a8}.

5. Discussion

The laboratory experiment has both replicated and extended previous research on confirmatory bias, cognitive dissonance, and change in management accounting. First, the results of the first part of the experiment are consistent with the previous findings regarding confirmatory bias (e.g. Koehler, 1993; Mahoney, 1977). Committed people judged a system that was consistent with their favored system as more useful than the alternative system. These results are also consistent with the prediction of the theory of cognitive dissonance (Aronson, 1968; Festinger, 1957). That is, people exaggerated their chosen alternative and downgraded the rejected alternative. Previous cognitive dissonance research, however, fails to give people feedback about their choice. Feedback can provide information about consequences of prior decisions and can signal that the decision might need to be adjusted (Lockett, Briers & Chow, 1995). This study extends the findings of cognitive dissonance research by incorporating feedback on people's prior decision. Previous research indicated that, after making a decision, people tend to seek information that is consistent with their choice of action (e.g. Birnberg & Heiman-Hoffman, 1993; Geller & Pitz, 1968; Pitz, 1969; Swann

& Read, 1981). Consistent with the suggestions of these authors, the results suggested that committed people ignored negative feedback about their prior decision. People's confidence of their chosen system was unshaken by the fact that it caused them to receive negative feedback (i.e. resulted in a lower profit than their competitors).

Second, the results of the second part of the experiment refine those of Foran and DeCoster (1974). Foran and DeCoster found that negative feedback resulted in decreased confidence in the chosen alternative while positive feedback resulted in increased confidence in the chosen alternative. The results of the study reported here showed that although the direction of the findings of Foran and DeCoster was preserved, the effects were different for committed and non-committed people. When people received positive feedback, both groups showed high inertia (parallel to high confidence in the chosen alternative) and their responses were not significantly different. It is possible that when people received positive feedback, committed people did not experience dissonance because there was no threat to their image as smart people (Akerlof & Dickens, 1982; Cooper & Fazio, 1984). However, when they received negative feedback, committed people "refused" to reduce their inertia level. They showed significantly higher inertia than non-committed people. When they received negative feedback, the inertia level of the committed people was not significantly different than when they received positive feedback. These results are more consistent with the prediction of the theory of cognitive dissonance. That is, when facing negative feedback, committed people tried to rationalize their choice (i.e. their "bad" choice) and, in turn, were more resistant to change than those who did not make such a commitment.

Third, this study contributes to studies of innovation and change in management accounting by identifying individuals as a source of resistance. Specifically, this study showed why people are motivated to resist change and what mechanisms they used to resist change. The motivation to resist change originated from people's view of themselves as smart and intelligent people. Information that conflicts with this image tends to be ignored or rejected. People who have made a decision tend

to discard information that would suggest error to avoid conflict with their image as smart people (because the cognition that the decision might be in error is in conflict with the cognition as smart people) (Akerlof & Dickens, 1982). The results also showed that people assessed only a subset of their knowledge to support their desired conclusion (Kunda, 1990). Although they were presented with the same information, people used only that information which supported the conclusion they wanted to make and ignored the information that contradicted their desired conclusion. Committed people thought that their chosen system was more useful than the rejected system. People came to their desired conclusion by exaggerating the usefulness of their chosen system and downgrading the usefulness of the rejected system.

Finally, this study confirms that people normatively know that their judgment should be objective yet they unconsciously make prejudiced judgments biased toward their desired conclusion. The results revealed that people were not aware that their judgments were in favor of their chosen system. They thought that their judgments were objective. They also agreed that people should be objective in making decisions.

5.1. Policy implications

Several important implications regarding people's judgment and their willingness to change emerged from this study. First, participation (i.e. the opportunity to choose their preferred system) increased people's commitment to their choice. Second, commitment to a choice caused people to become insensitive to the potential benefits of the alternative system. Finally, people did not change their confidence in their chosen system in response to the feedback they received. The results seem to confirm Kunda's (1990) conjecture that motivated reasoning (reasoning that is biased toward one's prior beliefs) can be dangerous when it is used to guide important decisions.

The theory of cognitive dissonance offers some insight into how to reduce resistance to change. Aronson (1973) argued that people cannot live by consonance alone. They need to grow and mature. Dissonance reduction is only one of several

motives, and other powerful drives can counteract it. He further asserted that,

If human beings had a pervasive, all-encompassing need to reduce all forms of dissonance, we would not grow, mature, or admit to our mistakes. . . . But obviously people do learn from experience. They often do tolerate dissonance because the dissonant information has great utility. As utility increases, individuals will come to prefer dissonance-arousing but useful information (p. 52).

Researchers have conducted numerous studies to develop effective intervention techniques for reducing and overcoming people's resistance to change. Some have pointed out the need to communicate the proposed change to the people in organization (e.g. Argyris & Kaplan, 1994; Janis & Mann, 1977). Communication is an instrument to transfer information from senders to receivers of the information (Fisher, 1978). Communication increases recipients' knowledge about the object being communicated (Kirkpatrick, 1985). The important roles of communication in the change process have been discussed extensively in the change management literature (e.g. Beckhard & Pichard, 1992; Daly, 1995; Ford & Ford, 1995; Kotter, 1990). In this context, the purpose of communication is to provide some stimuli to people so that their attitude and perception toward the proposed change become more optimistic. Researchers have pointed out several roles for communication in the change process. These include announcing and explaining change (Jick, 1993; Thorne & Gurd, 1995); increasing people's understanding of and commitment to the proposed change (Beckhard & Pichard; Morgan, 1988); reducing confusion about and resistance to change (Kotter & Schlesinger, 1979); diffusing dissatisfaction with the status quo to inspire people to change (Beer, 1980; Spector, 1989); and sustaining the change (Kirkpatrick, 1985).

Results from this study also indicated that allowing people to participate in the change process (i.e. the opportunity to express their opinion) will induce their initial commitment to new initiatives. Participation encourages people to be

involved and sends signals that they are valued. Through participation, people have opportunities to make choices and to develop a sense of responsibility for their actions. Beer, Eisenstat and Spector (1990) asserted that participation helps people to develop a shared diagnosis of what is wrong in an organization and what can and must be improved. A considerable number of studies have convincingly shown that participation leads to both commitment and acceptance of new initiatives (e.g. Cooper, Kaplan, Massel, Morrissey & Oehm, 1992; Gilmore & Barnett, 1992; Janis & Mann, 1977; Sagie, Elizur & Koslowsky, 1990). Two field studies by Cooper et al. (1992), conducted to examine the implementation of activity-based costing, showed that resistance was less likely when people were involved actively in the change process. In an entirely different setting, a laboratory experiment by Sagie et al. (1990) reported that people who had an opportunity to participate in strategic and/or tactical decisions regarding a proposed change significantly reduced the resistance level.

When people choose their own volition to do something, they often feel responsible. When the choice is volition, explicit, public, and irrevocable, the commitment is even more binding (e.g. Cooper & Fazio, 1984; Salancik, 1977). If people are involved from an early stage of a change process, they will be more committed to the implementation of a new initiative. The reason is that if people chose to participate in the development of the new initiative, then they will be committed to their choice.

5.2. *Limitations*

Results from the laboratory experiment suggested that people's judgments about the usefulness of a costing system were influenced by whether the system confirmed or disconfirmed their favored system. The results also showed that committed people were more reluctant to change than non-committed people regardless of the feedback they received.

While an experiment is useful for providing a controlled environment in which to test the model and the proposed hypotheses, the issues and studies

are artificial. That is, participants have little knowledge of the relevant areas, and their level of involvement is lower than that of practising managers. Therefore, caution should be taken in making inferences from the results of this study. Some researchers, however, argue that the generalizability of the results is based on the theoretical predictions rather than the experimental findings *per se* (e.g. Aronson & Carlsmith, 1968; Swieringa & Weick, 1982).

Another limitation centers on the fact that this study is a one period model. That is, people only receive a single feedback (either negative or positive) regarding their prior decision. People's reaction to multi-types of feedback might be different from that observed in this study.

As always, care must also be taken with aggregate findings. Even though the statistical analyses suggested that committed people are more resistant to change, it is interesting to note that a small number of subjects (six out of 89) who had prior belief in TCS (or ABC) changed their belief when presented with information about the alternative system. In addition, some subjects realized that their judgments were influenced by their chosen system.

Finally, this study only considers commitment, confirmation, and feedback as the variables of interest. Other variables, such as technical factors and economic factors might also play a significant role in the continued use of an existing system.

5.3. *Directions for future research*

The experiment reported in this thesis is a preliminary step toward understanding individuals' resistance to change. Many other issues related to people's resistance to change deserve further investigation. Further studies are needed to provide refined indications of, for example, the conditions under which resistance to change is most likely to occur. Are there circumstances under which resistance will not occur? Under what conditions may people's commitment to prior beliefs be reduced or revised? Taking account of the results from the experiment reported here and findings from previous studies, it is suggested that participation and communication can be used to reduce or overcome resistance to change. Participation and

communication are especially useful in enabling people to fully explore the implications of the new initiatives which often are being dismissed by means of rationalizations and defensive bolstering mechanisms.

The experimental study can be extended in several directions. First, it would be interesting to investigate the effect of feedback in a multi-period setting. Some researchers have argued that people revise their initial beliefs differently when facing different sequential feedback (i.e. Asare & Messier, 1991; Kerr & Ward, 1994). For example, by varying the feedback so that some participants receive constant negative, constant positive, and alternate feedback, one can study the impact of sequential feedback on the revision of initial beliefs.

Second, this study investigates between-subject differences of feedback. It might be interesting to conduct a longitudinal study to investigate within-subject cognitive dissonance. In this case, the cognitive dissonance could be measured before and after participants declared their beliefs to determine whether their judgments were different before and after they made a commitment to a particular choice of action.

Third, this study can be extended to involve practicing managers. It is possible to evaluate real managers' judgment about the usefulness of a costing system given they hold different beliefs (ideally opposite to one another). Using practicing managers, however, limits the manipulation and control of variables. For example, it is difficult to disentangle the effect of commitment, confirmation, and feedback on managers resistance to change without considering other variables such as economic and technical constraints.

Finally, the investigation of the influence of people's commitment on their subsequent behavior need not be limited to the study of changing a costing system. For example, the predictions of this study can be used to study several areas involving participation such as budgeting, performance evaluation, Total quality management (TQM), business process reengineering (BPR), and ISO9000, etc. That is, one can investigate whether better communication and increased participation cause people commit to a course of action which, in turn, will increase their stake in

the successful implementation to the decision to which they are committed.

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