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The Cognitive Perspective in Strategic Choice

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Abstract

This paper examines to what degree organizations use strategies that focus on maximizing shareholder value (Theory E) or if they use strategies emphasizing the development of organizational capability (Theory O). Applying a cognitive perspective in strategic choice, our main goal was to investigate to what extent cognitive biases influenced strategic choices. A survey was developed that measured different aspects of the cognitive perspective in strategic choice. It was distributed to managers of several medium-sized organizations in Scandinavia (n = 119). The results indicated that managers used mixed strategies (Theory E and O) contrary to recommendations. Results also revealed that illusions of control together with beliefs about change processes skewed the application of strategies towards Theory E. Theoretical and practical implications of the results were finally discussed enlightening the cognitive perspective in strategic choice.

1 INTRODUCTION

Change can be difficult for organizations even in normal circumstances. Yet, when the financial crisis appeared as an indisputable fact in September of 2008, many companies were forced to do something. In Norway about two thirds of businesses chose change as a means to counter the financial crisis (Lien, 2011). In this context, it is interesting to learn what strategy organizations followed in order to manage their change. In addition, we ask ourselves to what extent cognitive biases could have affected their choice of strategy?

Among many models of organizational change, Beer and Nohria (2000a, 2000b) presented one based on the assumption that changes can be described along six dimensions: (1) the goal, (2) the leadership, (3) the focus, (4) the process, (5) the motivational system, and (6) use of consultants. Depending on choices made within the dimensions, one can derive two archetypical approaches to change called *Theory E* (economic value-driven change) and *Theory O* (organizational capability-driven change), based on what is the goal of the change. These are so-called theories-in-use, in that they describe what practitioners really do, and by examining the actions taken one can deduce which change strategy implicitly underlies the initiative (Beer & Nohria, 2000a, p. 3).

None of the theories are inherently superior to the other, but both have their distinctive advantages and limitations. While Theory E often lead to quick results, the long-term gains tend to remain absent. In contrast, Theory O typically leads to increased effectiveness, but earnings are realized only after a long time. Most change efforts are some form of hybrid of the two, and it is indeed argued that a synthesis is the better approach if done correctly (Beer, 2001; Beer & Nohria, 2000a, 2000b). But a well-integrated approach is also more difficult to achieve, because of the innate contradictions of the two theories. Some organizations therefore chooses to sequence the approaches, which can be done with an E-strategy followed by an O-strategy – in the opposite case the benefits from the O-phase will be eradicated in the E-phase. However, many organizations end up with an arbitrary blend, reaping the drawbacks of both theories and the benefits of none (Beer & Nohria, 2000a, 2000b).

Table 1 about here

Goals

The choice of goal is an important part of the change process because the goal tends to influence the strategy of the other dimensions. A theory E-strategy is characterized by a singular goal, namely maximizing the value of the organization, usually measured by stock value (Beer, 2001, Beer & Nohria, 2000a, 2000b). This provides management with a clear purpose, and avoids distractions arising from having multiple goals whose pursuits interfere with each other (Jensen, 2000, 2002; Sundaram & Inkpen, 2004). In Theory O the aim is to create a system that enhance employee commitment and improves performance, thereby achieving high efficiency (Beer & Nohria, 2000a). The view then may be that firms' context is so complex that the outcome of a change cannot be predicted with reasonable accuracy. Instead, the organization can learn to identify patterns in their environment, and understand what consequences their actions have (Marion & Uhl-Bien, 2001; Senge, 2000). To integrate Theory E and O one must explicitly acknowledge that increasing economic value is important, but not sufficient, and that organizational capabilities must also be developed. Expectations about quick results must be met with communication that change will require time to accomplish (Beer, 2001; Beer & Nohria, 2000a, 2000b). The goal, then, should express values and consideration of the interests and rights of other constituents than the shareholders (Etzioni, 1998; de Luque, Washburn, Waldman & House, 2008).

In goal setting, managers' choice may be influenced by cognitive biases (Narayanan, Zane, & Kemmerer, 2011). One is that the financial crisis might direct managers' attention to economic value rather than organizational capability, if falling revenue is accentuated or feared. Hence the financial crisis may make information pertaining to economic value more readily available when a goal is to be set. Also, financial goals are more tangible than goals for capability development, and therefore easier to imagine. This may lead Theory E-strategies to be preferred on the goal dimension.

Leadership

With Theory E change is lead from the top-down, making decisions with little involvement from levels below. Consensus is not considered important, and the rest of the organization must settle with implementing the top leader's decisions (Beer & Nohria, 2000a, 2000b). The underlying beliefs then may be that only senior executives have the strategic overview to make such decisions (Conger, 2000), that in many cases there isn't time to build consensus through a

participative leadership style (Beer & Nohria, 2000a), and that in crises leaders are often expected by subordinates to act autocratic (Muczyk & Steel, 1998; Selart, 2010; Yukl, 2010). In contrast, with Theory O executives will define core values to guide the change, but leave it to lower levels of the hierarchy to identify problems and craft solutions. Such participation is likely to increase employees' commitment to the change (Beer & Nohria, 2000a; Yukl, 2010). An integration of Theory E and O entails top management setting direction for the change, but engaging lower hierarchal levels to engineer good solutions. That is, leaders need to retain control, but also acknowledge that they don't have all the answers (Beer & Nohria, 2000a; Yukl, 2010). Particularly in knowledge-intensive organizations employee involvement is paramount, because they often have a better understanding of the work than their leaders (Dunphy, 2000). Leaders' efforts to influence the change should then include indirect methods such as symbolic actions (Conger, 2000; Yukl, 2010), and developing the mental models used to comprehend the situation the organization is facing (Mumford et al., 2007).

The strategy for leading the change might also be affected by cognitive biases. For instance, the traditional image of a leader is heroic (Meindl, 1990). Managers may then believe a successful change depends on a strong leader who controls the process. Furthermore, people have an inherent need to control one's environment (Langer, 1975). Both of these issues may favor Theory E-strategies being selected on the leadership dimension.

Focus

According to Theory E, organizations should focus on changing "hard" components, such as the organization's structure and systems (Beer & Nohria, 2000a, 2000b). Typical Theory E-measures, then, include downsizing, new routines, or changing the formal authority of jobs. These are efforts that are under the direct control of managers (Yukl, 2008, 2010) and can be implemented swiftly (Beer & Nohria, 2000a). But many firms that have restructured their organization have failed to reap the expected benefits (Andersen & Jonsson, 2006; Cascio, 2002). In Theory O the focus of change is on "soft" elements, most notably corporate culture (Beer & Nohria, 2000a, 2000b). Culture is ubiquitous in the organization and has significant influence over members' behavior, and, though there may be several subcultures, some beliefs are usually shared across these (Bang, 2011; Schein, 1990, 2010; Selart & Schei, 2011). Nonetheless, organizational structure and culture are interdependent (Bang, 2011; Schein, 1990, 2010), and an integration of Theory E and O emphasizes to change both so that they complement each other. A new structure needs to allow for more appropriate behaviors, and a

new culture must contribute to the structure functioning as intended (Beer & Nohria, 2000a, 2000b; Cohen, 2000).

Also the focus of change could possibly be influenced by cognitive biases (Selart & Johansen, 2011). First, structural efforts are among the most common responses to organizational crises, such as the financial crisis (Selart, Johansen, & Nesse, 2013), and might therefore be considered as representative and more appropriate than what is really the case (cf. Tversky & Kahneman, 1983). Further, organizational structure is more tangible than corporate culture, which may cause the availability heuristic to favor these types of measures (Schwenk, 1984).

Process

By process is meant the method that is used to identify problems and implement solutions in a change initiative. Theory E-strategies adheres to a clearly planned and coordinated process, under the assumption that successful change requires a structured process (Beer & Nohria, 2000a, 2000b). Theory O-strategies, on the other hand, follows an emergent process (Beer & Nohria, 2000a, 2000b). Advocates of this view believe that organizations' environment is too unstable for a centrally planned process to succeed (Burnes, 1996). Instead organizations should change incrementally, and use of experiments and learning to develop a better understanding of the process and reinforce what seems to work (Burnes, 1996; Weick, 2000). Nevertheless, change can have both planned and emergent elements simultaneously or at different stages of the process (Van de Ven & Poole, 1995). Weick and Quinn (1999) claim that emergent change occurs continuously in pockets of the organizations, and that distributing such isolated innovations to the rest of the organization will be more episodic in character. As a compromise, integrating Theory E and O involves forming a plan for how people lower in the hierarchy are to proceed in exploring possible solutions, to increase engagement and leave room for spontaneity (Beer & Nohria, 2000a; Yukl, 2010).

If cognitive biases are to influence which change process is preferred, a need for and illusion of control seems the most likely to have an effect. The need for control may cause management to want to control the process, and the illusion of control may lead them to believe that the process is more controllable than it actually is (cf. Langer & Roth, 1975).

Motivation system

To motivate employees to accept and implement the change, Theory E relies primarily on financial incentives that align the employees' and the organization's interests (Beer & Nohria, 2000a, 2000b). A well-developed reward system can be an effective manner to induce desired behavior, particularly if incentives are clearly tied to the performance that is rewarded (Lawler, 2000; Lawler & Worley, 2006; Peterson & Luthans, 2006; Stajkovic & Luthans, 2001). But designing a system that doesn't adversely twist effort is difficult (Lazear & Gibbs, 2009; Thompson, 2008). With Theory O, motivation is found through participation and commitment (Beer & Nohria, 2000a; Johansen & Selart, 2005; Lines, Selart, Espedal, & Johansen, 2005; Lines & Selart, 2013). To be involved in the process can be motivating if the work is challenging and allows employees to grow on a psychological level (Alderfer, 1969; Herzberg, 1968; Kaufman & Kaufman, 2009; Nohria, Groysberg & Lee, 2008). Involvement may also install a satisfying feeling of control over the situation, even if this control is not real (Langer & Roth, 1975). An integration of Theory E and O entails using Theory E-incentives in a Theory O-way. Motivation should then be created through involvement, but financial incentives can be used to reward commitment (Beer & Nohria, 2000a, 2000b). Rewards can enhance the original motivation when they are perceived as validation, or involves the employees even deeper (Amabile, 1997).

In the Nordic countries involvement and collective participation are highly esteemed values, and individual performance is rewarded only moderately (Javidan, Dorfman, de Luque & House, 2006). Especially Norwegian leaders are inclined to adhere to beliefs that are common in the national culture (Smith, Andersen, Ekelund, Graversen & Ropo, 2003). It is therefore plausible that when Norwegian managers consider which system of motivation is appropriate, the option of a participative strategy may appear representative and dominant (Selart, Nordström, Kuvaas, & Takemura, 2008).

Use of consultants

Many organizations hire consultancy firms to aid in the change process, but what role they have may vary (Selart, 2005; Furusten, 2009; Pellegrin-Boucher, 2006). In a Theory E-strategy consultants are used extensively both to analyze problems and concoct remedies (Beer & Nohria, 2000a). The belief, then, is that successful change requires a total system perspective, with experts working on all levels of that system (Neill & Mindrum, 2000). Furthermore, managers often do not know what they really need from consultants, so leaving them to develop

finished solutions may in many cases be psychologically preferred (Fincham, 1999). In Theory O, on the other hand, consultants will be restricted to helping management develop a process so that they can explore problems and solutions themselves (Beer & Nohria, 2000a). To integrate Theory E and O, the aim is to use consultants as expert resources that empower employees and contribute with technical competence to develop the change process, but without management giving up control (Beer & Nohria, 2000b). Also, the presence of consultants may in itself have a signaling effect that legitimizes and creates acceptance of the change (Pellegrin-Boucher, 2006; Smith et al., 2003).

Different cognitive biases may influence managers to both increase or decrease their use of consultants. A need for control may cause managers to feel uncomfortable leaving some of the control to consultants, and an illusion of control may lead managers to fail to recognize a real need for assistance (Selart, Schei, Lines, & Nesse, 2020). However, Fincham (1999) point out that consultants are skilled at impression management, so that consultants may be perceived to epitomize change. Managers relying on intuitive impressions of consultants may then come to increase their use of the

Most of the reasoning presented above suggest that leaders will select a Theory E-approach for their change. This is in accordance with the assumption that the choices made on the different dimensions of change will cluster around either a Theory E-strategy or a Theory O-strategy. Particularly the choice of goal tends to influence strategy on the other dimensions (Beer & Nohria, 2000a). Since the theory proposes that most leaders will choose Theory E-goals, Theory E might be the principal strategy among organizations. However, some firms may have applied the outside view (cf. Lovallo & Kahneman, 2003) when they evaluated their options. This method is supposed to reduce the occurrence of cognitive biases.

2 METHOD

The purpose of this paper was (1) to map which strategies for change organizations had used, and (2) to investigate if cognitive biases may had affected their choice of strategy. In order to answer this we selected a hypothetico-deductive approach and a survey strategy with an online questionnaire designed in the software QuestBack. Survey strategies are common when the respondents are executives – a group difficult to reach by any other method (Friedrich, Byrne & Mumford, 2009). QuestBack was chosen because it allows for automatic filtering of

questions, and because data collected with QuestBack comes ready to analyze in the statistics software SPSS. We used email to distribute a link to the online questionnaire, since email is a cost efficient way to reach many respondents. The email message functioned as a covering letter. In attempted to increase response rates. The covering letter accentuated that the topic at hand may be of personal interest for the respondents (Anseel, Lievens, Schollaert & Choragwicka, 2010; Bryman, 2012; Groves, Presser & Dipko, 2004), and that they were assured anonymity (jf. Anseel et al., 2010). Respondents were also offered to receive an executive summary of the findings as an added incentive (cf. Groves, Cialdini & Couper, 1992). Also, two reminders were sent out three work days apart.

2.1 Population and sampling

The target population for this investigation consisted of executives in organizations that had instigated changes. The size of the population was unknown, but an initial survey conducted at Norwegian School of Economics found that about 80 % of Norwegian businesses were adversely affected by the financial crisis (Lien, 2011). The study also showed that around 45 % of businesses had changed their investments in organizational development or employee's skills, and that nearly 50% of businesses had changed their investments in tangible assets. It is not clear what percentage of businesses had changed both types of investments or how many businesses that had *not* made any such changes.

The database www.proff.no contained 1,333,251 companies, based on official registers. We considered it appropriate to restrict our target population to companies that met the following criteria:

1. The organization must not be a public-service entity, because maximizing profit must be a real potential purpose for the organizations existence.
2. The organization must have at least 25 employees, because Beer and Nohria's (2000a, 2000b) change model is developed primarily with large companies in mind, and we wished to examine organizations with few restrictions of which change measures were available to them (e.g. that they had the opportunity to downsize without seizing their existence).
3. The organization must have been established before 2007, so that the financial crisis may had been experienced as an interruption of normal operations.

This filtering returned a list of 8,272 organizations. Based on Lien's (2011) findings, we estimated that about two thirds of organizations had initiated change, which provides a calculated target population of 5,542 organizations.

2.1.1 Sample size and sampling method

To achieve a representative we assumed that we needed approximately 100 responses from organizations that had initiated change. Because questionnaires administered over the Internet usually achieves lower response rates than other survey methods (Anseel et al., 2010; Couper, 2000; Manfreda, Bosnjak, Berzelak, Haas & Vehovar, 2008), and that executives generally provide lower rates than other populaions (Anseel et al., 2010; Bryman, 2012), we considered it reasonable to expect a response rate of about 15 % for our survey. By taking into account that around two out of every three organizations had instigated change, the smallest necessary sample size (S) is found by:

$$100 = S \times 0,15 \times 0,67$$
$$S = 100 / (0,15 \times 0,67) \approx 995$$

The selection of sample units started by ordering the 8,272 companies on the list alphabetically and assigning them a number corresponding to their position on the list. Then 1,100 random numbers were drawn using Microsoft Excel. After deleting duplicates, 1,044 unique numbers remained, each representing an organization on the list. A request was then sent by email to these 1,044 organizations, with instructions to direct the inquiry to the top management. A few of the organizations did not have any email address disclosed, and these companies were replaced with the actual organization following them on the list, until 1,044 organizations had been contacted.

2.2 The instrument and operationalization

Due to the nature of our investigation, we decided to develop our own questionnaire. The operationalization of change strategies consisted of developing closed questions about which change actions the organization had undertaken, except for on the goal dimension where respondents also had the opportunity to answer with their own words. Answers were categorized with the help of a scale with a low score representing a “pure” Theory O response and a high score representing a “pure” Theory E response. This approach allowed us to differentiate between Theory E-strategies, Theory O-strategies and combination strategies on each of the change dimensions. However, we were not able to distinguish between different types of combinations (e.g. integration or arbitrary blend). Such a distinction would require an examination of each organization that was beyond the capacity of this investigation, so we limited our ambition to map strategies in terms of “degree of” Theory E or O.

Cognitive biases are difficult to measure on an ex-post basis using a questionnaire, so our attempt was to measure respondents' beliefs and attitudes. Our assumption was that if cognitive biases had affected leaders' choice of strategy in the decision moment, the impression created by the bias may have persisted. This is because public decisions, such as choices about organizational changes, is likely to cause a strong need to appear consistent (Cialdini, 2001). Operationalization of cognitive biases therefore entailed forming a range of statements, where respondents would indicate their degree of agreement on a seven-point Likert scale. Statements that served to measure cognitive biases were developed for each of the hypotheses, in addition to statements serving to measure optimism and inside/outside views. An overall assessment of the questionnaire resulted in around 65 items being selected for further development, which was considered an appropriate amount with an expected completion time of about 15-20 minutes.

2.2.1 Validity and reliability

The questions addressed to measure cognitive biases were tested in a pilot study on 11 college students. Their responses were subject to an initial factor analysis in SPSS and tested for convergent validity (i.e. connected items should load on the same factor) and discriminant validity (i.e. items should not load on more than one factor). As a rule of thumb, convergent validity items should load at least 0,5, whereas discriminant validity items should load no more than 0,3 (Sannes, 2004). The initial factor analysis resulted in some improvements and the final instrument consisted of 67 items. The responses from the actual survey were also subject to a factor analysis, and the result from this did not differ from that of the pilot test. Questions regarding change strategies were not tested in the pilot study because of their objective nature.

The final factors were tested for reliability using *Cronbach's alpha* (α). Cronbach's alpha can be viewed as a confirmation of the factor's strength (Cortina, 1993). Ordinarily an alpha-value above 0,7 ($\alpha > 0,7$) indicates a stable factor (Cortina, 1993; Sannes, 2004), but for psychological concepts, values somewhat below 0,7 is not unreasonable to expect, due to the diversity that the concepts are forming a measure of (Field, 2009). Furthermore, α tends to increase with the number of items (Cortina, 1993; Field, 2009). This also suggests that $\alpha > 0,7$ might be difficult to achieve for our factors, because many of them consists of very few items, due to the necessary limitation of our questionnaire's length. The tests also showed this to be the case, with seven factors achieving $\alpha > 0,7$, four factors achieved $0,7 \geq \alpha \geq 0,5$, and another seven factors failing

to achieve $\alpha \geq 0,5$. All factors were retained for statistical analysis, but any results involving factors with $\alpha < 0,5$ should be interpreted with caution.

3 RESULTS

All together, 122 respondents replied to the questionnaire, but three of these were removed after inspecting their answers. These three responses contained almost exclusively answers in the extremes of the Likert scales, and appeared as outliers on many items. They were therefore considered to be insincere. All analyses was performed on the remaining 119 responses, which yields a response rate of 11,4 %. Among these 113 (95 %) were provided by the CEO or a member of the top management team, and 83 (69,7 %) belonging to organizations that had instigated change. Only 16 (13,6 %) of respondents had been in their position less than two years.

Table 2 about here

The organizations that had implemented change seemed to tend towards a Theory E-strategy on the goal and process dimensions, but towards Theory O on the use of consultants. On the focus and leadership dimensions organizations appeared to have used some form of combination strategy, while reward systems were rather evenly distributed along the possible degrees of strategies. The frequency distribution of strategies are shown below. Scales are coded so that a high score indicates Theory E usage and a low score indicates Theory O application. The reason for that the scales of the dimensions are of varying length is that for some dimensions a finer nuance was considered appropriate.

Table 3 about here

The cognitive bias-items were combined into a total of 18 factors based on the factor analysis. All items were coded so that a high score indicated a high presence of the relevant factor. For example a high score on the factor “Consultants: negative impressions” encompasses that the respondent has relatively strong negative attitudes towards consultants. All cognitive factors are summarized below.

Table 4 about here

3.1 Analysis of response distributions

How responses are distributed on a variable is important because many of the statistical tests rely on a number of parametric assumptions, including that variables are normally distributed (Field, 2009; Sannes, 2004). The standard deviation can be seen as a measure of how well the mean represents the data (Field, 2009), and in this case the deviation may be considered as fairly large (i.e. low precision). Skewness tells whether responses are clustered in one end of the scale (Field, 2009), and though our responses are not highly clustered, a slight tendency towards the upper ends of the scales was observed. Kurtosis is a measure of the shape of the distribution curve, where positive kurtosis indicates a pointed curve with heavy tails and negative kurtosis indicates a flatter curve with lighter tails (DeCarlo, 1997; Field, 2009). For skewness and kurtosis a value of $\pm 1,96$ is often considered acceptable (Sannes, 2004), which suggests that our data set was not particularly problematic in this regard.

To test if variables are distributed significantly different ($p > .05$) from a normal distribution Kolmogorov-Smirnov tests were conducted on each variable. Results show that only five of the cognitive factors were normally distributed: (a) Cultural beliefs, (b) Beliefs: Intrinsic motivation, (c) Consultants: Negative impressions, (d) Consultants: Illusion of control, and (e) outside view. Since the hypotheses were tested with multiple regression analysis and ANOVA, the primary limitation deriving from a lack of conformity is to what degree the results may be generalized to the population (Field, 2009).

3.2 Correlations

Cognitive factors correlated little with strategies. Of interest here is that “Process: Illusion of control” correlated with strategy on the process dimension ($r = .295, p < .01$), and use of consultants correlated with both positive ($r = .252, p < .05$) and negative ($r = -.400, p < .01$) impressions of consultants. Cultural beliefs correlated with strategy on the focus dimension ($r = -.205, p < .10$), as well.

3.3 Regression analyses

Multiple regression with leadership as the outcome variable did not reveal significant results with neither illusion of control or heroic views of leadership as predictor variables, which means the hypothesis lack support. One model containing number of employees as input variable provided the strongest result, with $R^2 = .065$ and $F(1, 81) = 5.645, p < 0,05$. The effect was

negative, which suggests that involvement of employees in decisions about change tended to increase with the number of employees.

Table 5 about here

With regard to the cognitive factors, only cultural beliefs correlated significantly with strategy on the focus dimension. Regression analysis supported this observation, $F(1,80) = 3.517$, $p < .10$. Though only weakly significant, the effect was negative, which means that leaders with cultural beliefs tended toward the application of Theory O-strategies. However, the model is only able to explain 4,2 % of the variation, which is considered rather low.

Table 6 about here

A model including “Illusion of control” and “Beliefs of change processes” as input variables provided significant results: $F(2,75) = 5.541$, $p < .01$. The latter factor was only marginally significant. The effect of illusion of control was positive, indicating that leaders who believed that they could control the change process tended towards using Theory E-strategies. The two factors combined account for 12,8 % of the variance.

Table 7 about here

Neither leaders beliefs about intrinsic motivation nor incentives correlated significantly with the organization’s use of financial incentives to implement change. Moreover, none of the models analyzed provided significant results either, “Optimism” was able to explain 6,8 % of the variation: $F(1,39) = 2.831$, $p = .10$. The optimism scale intended to measure how well respondents perceived their own organization on various domains compared to other firms in their industry. The effect was negative, which suggests that increased optimism about the leader’s own organization tended to reduce the use of financial incentives.

Table 8 about here

Both positive and negative impressions about consultants correlated significantly with choice of strategy. The tested model accounted for 28,2 % of the variance $F(2,79) = 10.212$, $p < .01$.

The effect of illusion of control was positive, but the wording of the items indicated that leaders who felt a *lack* of control relied more extensively on consultants, which means that leaders who *didn't* lack feelings of control used consultants less. However, only negative impressions of consultants achieved statistical significance. The effect is as expected that leaders with negative impressions reduced their use of consultants.

Table 9 about here

In addition, we applied a repeated-measures ANOVA, which examined variation in conditions when the same units provided data of each condition (Field, 2009). In this context, this refers to the variation of strategy choices across the six dimensions for each respondent. Repeated-measures ANOVA rest on the assumption of sphericity, which means that the variances in differences between respondents must be equal. This was tested with Mauchly's test, returning $\chi^2 = 20.706(14)$, $p > .10$, indicating that the deviation from sphericity was not significant and that the assumption hence was not violated.

The repeated-measures ANOVA showed significant variation: $F(5,180) = 13.464$, $p < .001$. Respondents' answers on strategy choice did not cluster in one end of the scale, but instead varied across the dimensions. The test was also performed on all six combinations with only five dimensions included, to test if one dimension was particularly troublesome. All these tests achieved significant F-ratios, but three of them violated the assumption of sphericity. In these cases the Greenhouse-Geisser- and Huyhn-Feldt corrections were all statistically significant ($p < .01$) and the epsilon (ϵ) values were far closer to 1 than the lower limit (.250). The violation of sphericity was therefore limited (Field, 2009), and one can conclude that there are significant variance in the choice of strategies across the change dimensions for each organization.

Table 10 about here

If the outside view is to reduce the tendency of cognitive biases, cognitive biases must be considered as outcome variables, while the outside view is given the role as predictor variable. These assumptions were tested with the application of a multivariate ANOVA (MANOVA), which, when using several dependent variables per independent variable, is a more appropriate test than using a univariate ANOVA for each dependent variable. This is because executing a series of ANOVAs increases the probability of type 1 errors (Field, 2009). The MANOVA

examines all variables simultaneously and avoids this problem. The MANOVA also accounts for relationships between outcome variables, and has greater explanatory power in that it can reveal changes between groups over a combination of variables, whereas ANOVA can only discover changes along a single variable (Field, 2009).

Before the test, respondents' score on the outside view was set to zero decimals, since their score consisted of the average replies on four items and MANOVA is a test of each of the different levels of the scale. A test with no adjustment would therefore have yielded many levels with very few respondents on each level. The result of the MANOVA exposed a total significant difference between groups ($p < .01$) for all test statistics. The test also automatically performs a univariate ANOVA for each outcome variable, and inspection of these tests revealed four outcome variables that vary significant with the outside view when tested alone. The four variables are (a) Goal: Vividness, $F(4,112) = 2.449$, $p < .05$; (b) Focus: Structural beliefs, $F(4,112) = 2.782$, $p < .05$; (c) Process: Illusion of control, $F(4,112) = 9.163$, $p < .01$; and (d) Beliefs: Intrinsic motivation, $F(4,112) = 7.377$, $p < .01$. By examining the Pearson correlations between these variables and the outside view, we found that all these correlations were positive and significant ($p < .05$).

Table 11 and 12 about here

4 DISCUSSION

The conducted analyses provided a mixed support for the hypotheses. Evidently, organizations have not applied an overall strategy to all change dimensions. Cognitive factors were not found to affect strategy on the goal- and leadership dimensions. Hence, the change could partially be explained by cultural beliefs. Optimism appeared to dampen the use of financial incentives, while a feeling of having control seemed to increase the amount of formal planning of the change process. A lack of feeling in control, absence of negative impressions of consultants, and a large organization in terms of number of employees increased the degree of use of consultants.

4.1 Organizations' change strategies

Our results reveal that most changes can be described by the six dimensions proposed by Beer and Nohria (2000a), and within the dimensions, an organization's strategy to change can be found to belong to Theory E, Theory O, or a combination of these. Our results indicate that organizations do not utilize one overall strategy across dimensions, but rather mixes their approach. For the most successful change, organizations seek to integrate Theory E and O. If this is beyond their capability, they will be better off sticking to either Theory E or Theory O than using a mixed approach, because a mixed approach is believed to result in the downsides of both theories and the benefits of neither. Though it is beyond the scope of this paper to evaluate the success of organizations' change efforts, the deviation from Beer and Nohria's (2000a, 2000b) recommendation is noteworthy. This may be interpreted as if organizations are lacking the competence to change, but more empirical data are needed to establish the accuracy of Beer and Nohria's framework before such a conclusion can be made. Moreover, more studies of what change strategies organizations employ should also be conducted.

4.1.1 Goals

Respondents' answers about the goal of their change corresponded best with the description of Theory E. Many claimed that reducing the organizations' costs was a central feature of the change, and a substantial number indicated an aim to change the organization's strategic position. Both of these goals can be interpreted as Theory E-goals. In contrast, the most commonly indicated Theory O-goal was to introduce more efficient operations. Our analysis did not reveal any cognitive biases that had an impact on organizations' choice of goal. This implies either that cognitive bias had little impact or that cognitive biases were not properly examined. Another interpretation is that the wrong biases were examined. An alternative explanation for why organizations tended towards Theory E-goals is that it helped prioritize between alternatives (Jensen, 2000, 2002; Sundaram & Inkpen, 2004). Put differently, executives might have been subject to incentive systems favoring Theory E-goals, or that potential gains from Theory O-goals might have been particularly low in this particular context. Still, Theory E-strategies are generally not optimal. Learning is not emphasized, which may cause challenges for firms in volatile environments (Marion & Uhl-Bien, 2001; Senge, 2000). Furthermore, goals that highlight the company's bottom line are not directly motivating for employees, so firms with this approach may have had greater difficulties evoking effort (de Luque et al., 2008).

4.1.2 Leadership

When it comes to leadership approach, many organizations evidently selected a form of combination of Theory E and O, and very few engaged in maximal or minimal involvement of subordinates in the decision making process. Our analysis also indicates that involvement tended to increase with the number of employees in the organization. An advantage of combining top-down and bottom-up approaches is that management may use their strategic overview to set direction (Conger, 2000), but subordinates' operational knowledge can still be utilized to determine what changes should be implemented and how (Dunphy, 2000; Yukl, 2009). Participation may also contribute to developing a shared mental model to understand the organization's situation (Mumford et al., 2007; Yukl, 2008). The results also suggest that at least one in three firms operate with teams in order to run the organization. This allows for team members to have complementary skills, and no member needs a full view of all parts of the firm, which makes challenges more manageable (Miles & Watkins, 2007). In solving complex problems, a leadership team can also exploit simultaneous thought processes that allow them to process more information and potentially identify better solutions than a single leader would have been able to (Cialdini, 2007; Thompson, 2008).

There may be many reasons for why most organizations seem to have selected a combination strategy in the application of their leadership. Cognitive bias is one possible reason, but our analysis did not discover this to be the case. Much research show that the national culture influences the leadership style (e.g. Hofstede 1980; Javidan et al. 2006). In the Scandinavian countries leaders generally apply a more participative leadership style compared to other parts of the world. Cooperation is encouraged and power distance between leaders and subordinates is low (Javidan et al., 2006). Smith et al. (2003) found that Scandinavian managers are especially non-authoritarian in their leadership style.

4.1.3 Focus

Which elements of the organizations that have been set to be the focus of change turned out to be a combination of measures from both Theory E and Theory O, but with a slight leaning towards Theory E. The three most common measures indicated was (a) downsizing, (b) reduced overtime, and (c) employees' change attitudes. The two first belongs to Theory E, while the third belongs to Theory O. Other typical measures was to change the organizational structure (n = 32), new routines for control (n = 32), and developing employees' knowledge and skills (n = 37). Most organizations had combined elements from both Theory E and Theory O, but a few

more had a selected a majority of E-measures than had selected a majority of O-measures. An advantage of Theory E-measures is that they can readily be changed by management (Beer & Nohria, 2000a; Yukl, 2008, 2010), but a one sided focus may have adverse effects (Cascio, 2002; Kets de Vries & Balazs, 1996). Organizational culture also affects behavior (Bang, 2011; Schein 1990, 2010), and an unhealthy culture may hinder profitability (Nohria, Joyce & Robertson, 2003). Around half of the companies that downsized had also implemented measures to alleviate the workload on remaining employees. Most of the companies that changed their structure had also attempted to modify their culture. This suggests that many organizations' change efforts have been well balanced. The results from our analysis indicated that one explanation of organizations' choice of strategy may be the extent to which leaders are concerned about culture's effects on behavior, but the effect was weak. Clearly, other factors account for much more of variation in strategy.

4.1.4 Process

Results from the questionnaire showed that most organizations have implemented changes according to a defined plan – that is, they tend towards a Theory E-strategy. Planning is useful to clarify *ex ante* what the organization should do, and to evaluate progress underway, but such estimates about future conditions are always encumbered with uncertainty. Furthermore, the more detailed such estimates are, *ceteris paribus*, the more probable it becomes that the estimate is wrong. Since planning (like all activities in organizations) takes up scarce resources, the amount of planning undertaken should be at an optimal level. In other words, planning has a utility and a cost. If the primary resource required for planning is time, a hypothetical cost function can be assumed to be linear, with a constant marginal cost function. A hypothetical utility function, on the other hand, may be assumed to be concave, with a declining marginal utility function. This is because increased planning (i.e. more detailed plans) will be subject to more uncertainty.

Our analysis attempted to explain organizations' choice of strategy on the process dimension by leaders' need for and illusion of control, and the results provided some support for this. A regression model that also included leadership ideas about how changes should be implemented, was able to account for 12,8 % of variation in strategy ($F(2,75) = 5.541, p < .01$). This, of course, suggests a full 87,2 % of variation is explained by other factors. To elaborate, people have an inherent need to control their environments (Langer, 1975) and even the act of planning may provide a confirming and comforting (but potentially false) feeling of control

(Hogarth & Makridakis, 1981). If planning cause leaders to feel an increased control of the situation, this is analogous to them perceiving increased utility of planning. Thus the illusion of control may cause leaders' implicit image of the hypothetical utility function to shift outwards. This would lead them to select higher degrees of planning than the real control they have over the situation would warrant. This point is illustrated graphically in Figure 1.

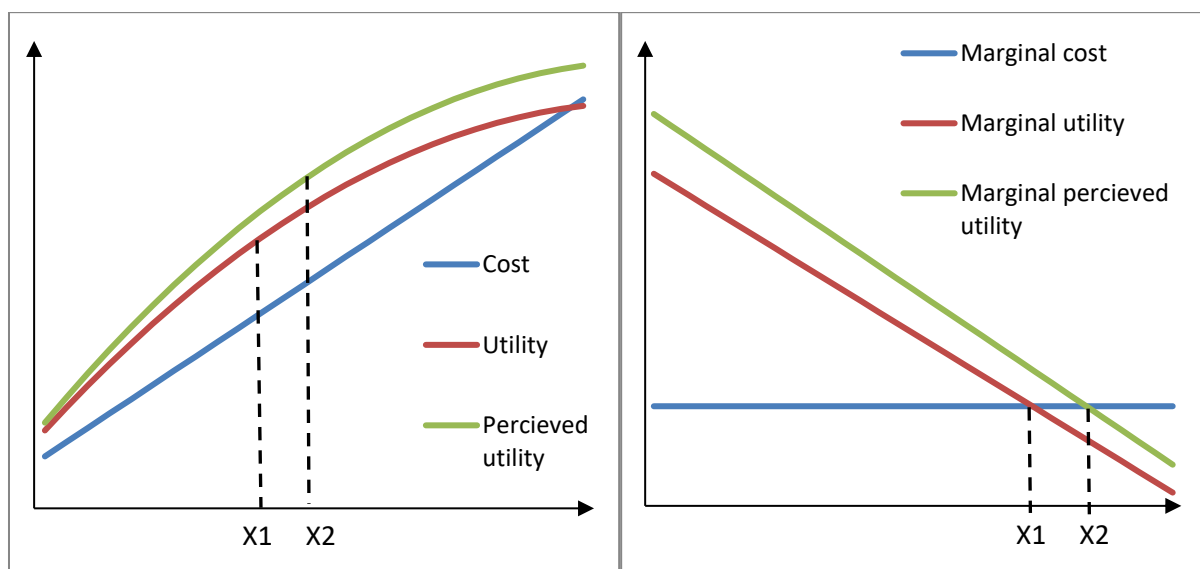


Figure 1. Hypothetical utility- and cost functions of planning. To the left hypothetical functions of utility and cost of planning are illustrated. Illusion of control may inflate leaders' perception of the utility of planning to above the real level. Maximum utility is at the point where the marginal cost of planning equals the marginal utility of planning, X1. Inflated sense of control could cause leaders to believe this point is at X2, where marginal cost is higher than the real marginal utility.

4.1.5 Motivation system

When organizations designed their motivational systems to contribute to a successful change process, they had the option to utilize financial incentives in a prominent or a supportive role (Beer & Nohria, 2000a). In our sample, only a minority used incentives in any way, and of these no pattern seemed to emerge to suggest that either Theory E- or Theory O-strategies have been more widespread on the motivation dimension. Lawler (2000) believes incentives should be used to make employees acquire skills that will be needed when the change is completed. Additionally, some respondents designated to have used financial incentives to support positive attitudes and involvement in the change, as is recommended in an integration of Theory E and

O (Beer & Nohria, 2000a, 2000b), and a fraction of the organizations used incentives as direct motivation.

There may be many causes for organizations' choice of motivation strategy in order to implement change. Financial incentives are known as an effective manner to induce desired behavior in employees (Lawler & Worley, 2006; Lazear & Gibbs, 2009; Peterson & Luthans, 2006; Stajkovic & Luthans, 2001), but designing an incentive system with few adverse effects may be difficult (Lazear & Gibbs, 2009). Knowledge of this may have deterred some organizations from wielding incentives to motivate change. Interestingly, we postulated that motivation strategy might be affected by leaders' intuitive impression about the use of incentives, which is likely to be influenced by the Scandinavian culture where involvement and collective participation is seen as more important than rewarding individual performance (Javidan et al., 2006). Interestingly, neither leaders' beliefs about extrinsic motivation nor intrinsic motivation were found to have significant effects. Instead, it was found that leaders' optimism about their firm's capability had a weak significant effect. The effect was negative, which suggests that optimism tends to reduce use of incentives, but the observed effect was only able to account for 6,8 % of the variation ($F(1,39) = 2.831, p = .10$). The fact that optimism seems to dampen the use of incentives suggests that leaders who have great faith in their organization may not see a need for incentives – an impression that may or may not be correct. Since the average score on optimism was 4.36 on a 7-point scale (i.e. slightly above the middle of the scale), it seems possible that at least some of the respondents were overoptimistic.

4.1.6 Use of consultants

Organizations' use of consultants was surprisingly low, even though reliance on consultants is commonly quite low in the Scandinavian culture (Smith et al., 2003). Only a minority of the organizations used consultants at all, and only two used consultants extensively. Apparently, few of the leaders have seen a necessity to draw on consultants' knowledge of change processes (e.g. Neill & Mindrum, 2000). Organizations' strategy on the consultant dimension then resembles Theory O more than Theory E. Interestingly, we found that leaders having an illusion of control also restricted their use of consultants. Our regression analysis did support this assumption. A feeling of control does indeed decrease leaders' involvement of consultants. The opposite effect (i.e. that leaders will use consultants more) was hypothesized to occur in leaders with intuitive impressions of consultants. Intuitive impressions of consultants were conjectured to be favorable, because consultants are excellent at impression management (Fincham, 1999).

The analysis also indicated that the number of employees in the organization had a significant effect, and that larger firms appeared to use consultants less than smaller firms. A model including the three significant factors (i.e. illusion of control, negative impressions, and number of employees) was able to account for 28,2 % of the variation in strategy on the consultant dimension ($F(2,79) = 10.212, p < .01$). This is a relatively large effect, considering that (a) negative impressions of consultants do not necessarily reflect reality, and that such subjective opinions tend to be robust to contradictory evidence (Anderson et al., 1980); and (b) how easily an illusion of control may arise (Hogarth & Makridakis, 1981; Langer & Roth, 1975; Lovallo & Kahneman, 2003). Both of these cognitive biases are serious, because both may potentially have leaders fail to receive help from consultants, even though their own organization may lack the necessary competence. Thus, leaders may be subjected to a tendency of change related errors, which could potentially harm the firm's profitability.

4.2 *Cognitive biases and perspectives*

Our analysis suggests that illusion of control and intuitive impressions may have an effect on organizations' choice of strategy on the process and consultant dimensions. Also, leaders with cultural beliefs seem to approach Theory O on the focus dimension, and optimism may have a dampening effect on organizations' use of financial incentives to motivate change. If leaders' decisions are influenced by one or more of these factors it may have adverse consequences on organizations' profitability, because these biases can stray decisions from what is optimal.

Kahneman and Lovallo (1993, Lovallo & Kahneman, 2003) proposed that leaders should use the statistical approach they call the outside view. The supposition that the outside view will reduce cognitive bias was adopted and tested with MANOVA. The results indicated that the outside view does have an effect on cognitive bias, and a follow-up ANOVA revealed that four cognitive factors – vividness of goals, beliefs about organizational structure, illusion of control over the change process, and beliefs about intrinsic motivation – correlated significantly. However, the effects on all four factors were positive, which seems to suggest that the outside view *increases* the tendency of these cognitive biases. This conflicts with Kahneman and Lovallo's (1993, Lovallo & Kahneman, 2003) prediction.

At first glance this may seem dramatic. However, when examining how the four factors that were affected by the outside view influenced strategy, only illusion of control over the change

process was significant. Why was this bias apparently reinforced by the outside view? One possible explanation is that the outside view is a planning activity. Organizations that use the outside view will collect statistics and information, and analyze their project in relation to the collected data (Lovallo & Kahneman, 2003). It seems likely that this activity comes in addition to at least some aspects of the more automatic inside view. The firms that take the outside view may then be engaging in more planning than those who stick with the inside view. This could mean two things. Firstly, it may mean that the outside view actually gives leaders more control, and makes them better able to evaluate projects and identify poor investments. Of course, this is the argument to use the outside view in the first place. However, secondly, since involvement in a planning activity in itself, it can increase one's sense of control (Hogarth & Makridakis, 1981; Langer, 1975). Even the erroneous use of the outside view (e.g. establish poor reference classes) may increase the feeling of control. Also, some leaders may take the outside view, but emphasize information that supports their original assumptions and downplay the relevance of conflicting information (cf. Hammond et al., 1998; Koriat et al., 1980). In this way the outside view may potentially increase both real and illusory control.

4.3 Implications

The findings from our survey have several possible implications for both academics and practitioners. However, prior to illuminating this, a commentary on the method seems in order.

4.3.1 Commentary on the method

For the findings from the survey to be generalizable to the population, the sample must be representative of it. Our sample was drawn randomly from the sampling frame, which reduces the probability of systematic differences between the organizations in the sample and the organizations in the population (Bryman, 2012; Saunders, Lewis & Thornhill, 2009). Further, a comparison of the number of employees in organizations in the sample and in the population shows that while some differences exist, these are not substantial, as is illustrated in Figure 2. The sample is characterized by a somewhat higher amount of large companies than what is found in the estimated population. Likewise, there are only small deviances between our sample and the sample drawn by Lien (2011), which was found to be representative, in terms of how the organizations experienced being affected by the financial crisis. For these reasons we believe our results may also apply to other medium and large organizations in Norway.

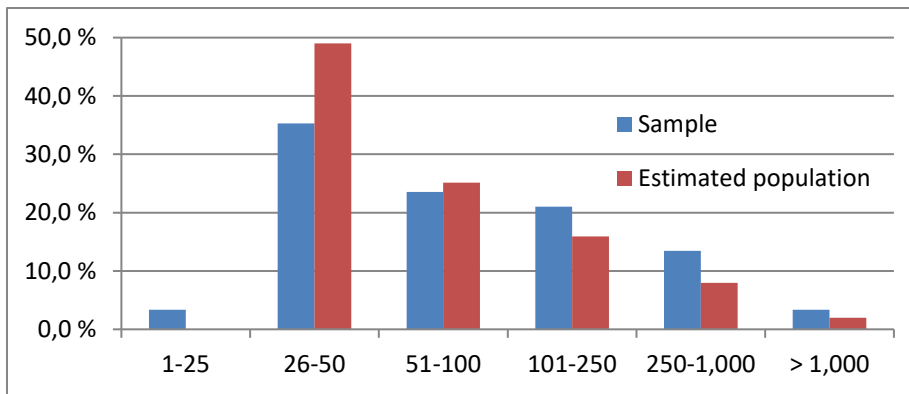


Figure 2. Size of organizations in the sample compared to the population.

Nevertheless, particularly two circumstances with our survey merits caution in interpretation of the results. One is that there are some issues with the internal validity, primarily due to weaknesses in the instrument. The questionnaire was developed from scratch because of the specific need for data, but several of the factors that emerged from the factor analysis failed to reach sufficient reliability as measured by Cronbachs alpha. This was in part caused by the low number of items of which many factors consisted, which again was a necessary consequence of limiting the questionnaire’s length to an acceptable level. The chosen number of items, then, was a trade-off between reliability and response rate. Unfortunately, the result of reducing the number of items was somewhat more prominent than hoped for in advance.

The second circumstance is that data about both dependent and independent variables was collected through the same method (i.e. questionnaire) and from the same source (i.e. the individual respondent). The results are therefore subjected to some common-method biases, which may produce stronger relationships between variables than what is the true effect, because the same measurement errors influence the variables equally (Friedrich et al., 2009; Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Two potential origins of such errors that may be especially relevant in this survey are (a) social desirability, and (b) need for consistency. Some respondents may have given answers that reflect what is more socially acceptable rather than their own opinions, especially if some items clearly reflect desirable attitudes (Podsakoff et al., 2003). Also, many people feel a strong need to appear consistent with themselves (Cialdini, 2001), and this may lead respondents to adapt their answers so that they match each other (Podsakoff et al., 2003). Ideally data about independent and dependent variables should be collected from different sources – for example data about cognitive factors from leaders, and data about strategies from employees or the organizations’ internal documents. However, this would require much more resources and was for our survey deemed unfeasible.

4.3.2 Implications for practitioners

Our findings may be relevant to many medium sized and large organizations that plan to implement changes of any magnitude. It seems that most organizations do not adhere to one strategy but rather mix Theory E, Theory O, and a combination strategies rather arbitrarily. The survey did not attempt to determine the firms' success, but the deviation from normative theory is noteworthy because the application of mixed strategies is deemed to have the lowest chance of success (Beer & Nohria, 2000a, 2000b). This suggests that many organizations have a potential to implement changes in a better way. By making more consistent strategy choices in the future, organizations may increase profitability more than if they stick to mixed strategies.

One possible reason why organizations evidently have chosen inappropriate approaches is that they lack competence of change processes. Implementing changes in situations such as during the financial crisis is a rare occurrence. It is remarkable, then, that so few of the organizations obtained help from consultants, which supposedly are in possession of this competence. Consultancy firms can accumulate demand for change competence from a large number of companies, and therefore they have a greater use for this competence than companies that only need this competence sporadically to implement internal change. Our analysis indicated that leaders who rely on their perceptions of control and intuitive impressions of consultants tend to use consultants less, and possibly less than what they should, considering the competence the organization is likely to have internally. This may cause firms to initiate changes they are unable to execute profitably. Thus, leaders should pay particular attention to these cognitive biases and take steps to correct them. For example, they can appoint a *devil's advocate* to challenge assumptions (Hammond et al., 1998).

4.3.3 Implications for theory

Much is already written on the topics covered in this paper – change management (e.g. Beer & Norhia, 2000a; Burnes, 1996), decision making and cognitive biases in general (e.g. Kahneman & Tversky, 1979; Langer, 1975; Simmons & Nelson, 2006), and cognition in organization contexts in particular (e.g. Mumford et al., 2007; Schwenk, 1984). Our study may be seen as having contributed in three areas. First, a basic mapping was made of what change strategies organizations have used. It seems that the goal of most changes in organizations is to increase organizational value. Organizations have apparently led this change by involving subordinates in decisions to a moderate extent, and focused on changing both the organizational structure

and culture. The change process seems to have been planned in advance, and consultants' involvement has mostly been minute. No clear majority of any strategy was found on the motivation dimension. The finding that organizations do not adopt one overall strategy across all dimensions, but instead seems to mix strategies arbitrarily, suggests many organizations have a potential to implement changes better than they have done. More research is needed to provide clearer instructions on how to best implement changes.

Second, we tested hypotheses to see if cognitive biases may have influenced organizations' change strategies. Some issues with validity limits this contribution, but among the more robust results we found that (a) leaders with a strong sense of control engage in more planning than leaders with a weaker sense of control; (b) leaders' perception of control and impressions of consultants parallel the extent to which consultants are involved in the change, and (c) the use of an outside view do not appear to lessen the propensity of cognitive biases, but rather increase the feeling of control in the planning process. This may be explained by the sheer amount of planning these organizations undertake, which in itself can increase leaders' feeling of control (Hogarth & Makridakis, 1981; Langer, 1975).

The third contribution is of a more methodological character, in that our questionnaire may be viewed as a first step towards a better instrument for researching this type of phenomena. Particularly the questions regarding optimism and perspectives seem promising and may productively be further developed. Additionally, organizations' number of employees was discovered as a significant variable on the leadership and consultant dimensions. This must be given consideration in future investigations, and should then be included as a control variable.

Much remains for future research to uncover. Examining change strategies with other research designs, for example in a multiple-case study, might be fruitful. This should provide more complete data on the change strategies employed, for example in a clearer differentiation between strategies that integrate Theory E and Theory O and strategies that just mix elements from both theories. One may then also better avoid common-method biases, by collecting data from predictor and outcome variables from different sources and through different methods. Such research may endeavor to develop a strong instrument to measure Theory E and O. Further, it may be of interest to examine in more detail how cognitive biases can affect change strategies. One remedy of some issues in our study may be to restrict the investigation to only a few of the change dimensions, if using a questionnaire to collect data. More items per factor

may then be included, which should improve reliability and validity. One goal of future research should be to develop an instrument to measure cognitive bias in organizational contexts. Much of prior research on heuristics and cognitive biases have been conducted in laboratory settings and are somewhat difficult to generalize to “the real world” (Bryman, 2012; Eysenck & Keane, 2010).

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Table 1. Summary of Theory E and O on each of the dimensions of change

Dimensions of change	Theory E	Theory O	Integrated E and O
Goal	Maximize shareholder value	Develop organizational capability	Embrace paradox between economic value and organizational capability
Leadership	Top-down management	Encourage participation from the bottom-up.	Set direction from the top and engage from below
Focus	Emphasize structure and systems	Corporate culture: employees' behavior and attitudes	Simultaneous focus on structure and culture (both the "hard" and the "soft")
Process	Plan and establish programs	Experiment and evolve	Plan for spontaneity
Motivation system	Motivate through financial incentives	Motivate through commitment	Use incentives to reinforce change, but not to drive it
Use of consultants	Consultants analyze problems and shape solutions	Consultants support management in shaping their own solutions	Consultants are expert resources who empower employees

Note: Adapted from Beer and Nohria (2000b).

Table 2. Overview of respondents

Variable	n	%
Initiated change (N = 119)		
Yes	83	69.7
No	36	30.3
Position in organization (N = 119)		
CEO	72	60.5
Member of top management team	41	34.5
Section manager	2	1.7
Middle manager	2	1.7
Other	2	1.7
Time in position (N = 118)		
Less than 2 years	16	13.6
2-5 years	27	22.9
5-10 years	23	19.5
More than 10 years	52	44.1
Number of employees (N = 119)		
1-25	4	3.4
26-50	42	35.3
51-100	28	23.5
101-250	25	21.0
251-1,000	16	13.4
More than 1,000	4	3.4

Table 3. The frequency distribution of strategies on the change dimensions

Strategy	Goal (N = 83)		Focus (N = 82)	
	n	%	n	%
1 – Theory O	–	0.0	2	2.4
2	2	2.4	5	6.1
3	4	4.8	10	12.2
4	18	21.7	27	32.9
5	21	25.3	22	26.8
6	32	38.6	12	14.6
7 – Theory E	6	7.2	4	4.9
	Leadership (N = 83)		Motivation system (N = 41)	
1 – Theory O	6	7.2	8	19.5
2	24	28.9	11	26.8
3	29	34.9	6	14.6
4	19	22.9	6	14.6
5 – Theory E	5	6.0	10	24.4
	Process (N = 78)		Use of consultants (N = 83)	
1 – Theory O	9	11.5	54	65.2
2	4	5.1	10	12.0
3	23	29.5	17	20.5
4 – Theory E	42	53.8	2	2.4

Table 4. Summary of cognitive factors (independent variables)

Factor	N	Mean	SD	Skewness	Kurtosis	No. items	Cronbachs alpha (α)
Cognitive biases and perspectives (independent variables)							
Goal							
Financial concern	119	5.28	1.229	-.818	.511	2	.351
Goal setting beliefs	119	4.50	1.115	-.137	-.836	2	.297
Vividness of goals	119	5.82	.904	-.627	-.036	2	<u>.597</u>
Leadership							
Heroic view of leadership	119	6.52	.556	-.895	-.019	3	.726
Illusion of control	119	4.86	1.093	-.636	.456	2	.264
Focus							
Structural beliefs	119	4.47	1.056	-.398	-.302	2	<u>.690</u>
Cultural beliefs	119	4.50	.775	-.402	1.107	3	.461
Vividness of actions	119	5.03	1.070	-.457	.340	2	.746
Process							
Illusion of control	119	5.50	.906	-.956	1.331	3	<u>.632</u>
Beliefs of change processes	119	4.32	1.191	.204	-.643	2	.326
Motivation system							
Beliefs: incentives	119	3.55	1.201	.051	-.562	2	.278
Beliefs: intrinsic motivation	119	5.86	.698	-.346	-.316	2	<u>.618</u>
Use of consultants							
Negative impressions	118	4.54	1.199	-.343	.317	2	.724
Positive impressions	119	4.58	1.119	-.303	.061	2	.702
Illusion of control	118	2.73	1.115	.309	-.369	2	.458
Optimism	119	4.36	.843	-.574	2.914	4	.790
Inside view	119	6.15	.657	-.272	-.880	5	.861
Outside view	119	4.91	1.139	-.741	1.067	5	.920

Note: Factors with $\alpha > .70$ is denoted in bold. Factors with $.70 \geq \alpha \geq .50$ is denoted with underscore.

Table 5. Multiple regression analysis on the leadership dimension

Variable	Choice of strategy on the change dimension			
	Model 1		Model 2	
	B	95% CI	B	95% CI
Constant	3.642***	2.992, 4,255	1.195	-1.170, 5.073
Number of employees	-.216**	-.397, -.035	-.208**	-.399, -.017
Heroic view of leadership			.185	-.261, .631
Illusion of control			.077	-.128, .281
Outside view			-.186	-.260, .298
Inside view			.146	-.261, .553
Optimism			.019	-.413, .040
R ²		.065		.112
F		5.645**		1.591

Note: **p < .05. ***p < .01.

Table 6. Multiple regression analysis on the focus dimension

Variable	Choice of strategy on the focus dimension			
	Model 1		Model 2	
	B	95% CI	B	95% CI
Constant	6.091	4.264, 7.917	6.480	3.545, 9.414
Cultural beliefs	-.387*	-.797, .024	-.438**	-.871, -.006
Structural beliefs			-.179	-.494, .137
Vividness			.124	-.230, .472
R ²		.042		.059
F		3.517		1.691

Note: *p < .10. **p < .05.

Table 7. Multiple regression analysis on the process dimension

Variable	Choice of strategy on the process dimension			
	Model 1		Model 2	
	B	95% CI	B	95% CI
Constant	1.030	-.325, 2.386	.083	-.2.187, 2.354
Illusion of control	.287***	.072, .502	.233*	-.040, .487
Beliefs of change processes	.157*	-.010, .324	.149*	-.024, .323
Optimism			.144	-.120, .408
Inside view			.034	-.352, .420
Outside view			.099	-.130, .327
R ²		.128		.153
F		5.541***		2.595**

Note: *p < .10. **p < .05. ***p < .01.

Table 8. Multiple regression analysis on the motivation dimension

Variable	Choice of strategy on the motivation dimension			
	Model 1		Model 2	
	B	95% CI	B	95% CI
Constant	4.863	2.518, 7.178	7.543	2.814, 12.271
Optimism	-.427*	-.941, .086	.488*	-1.005, .028
Beliefs: incentives			-.315	-.727, .096
Beliefs: intrinsic motivation			-.201	-.869, .466
R ²		.068		.137
F		2.831*		1.960

Note: *p = .10

Table 9. Multiple regression analysis on the consultant dimension

Variable	Choice of strategy on the consultant dimension			
	Model 1		Model 2	
	B	95% CI	B	95% CI
Constant	1.400***	.347, 2.454	1.494	-.413, 3.400
Negative impressions	-.273***	-.414, -.133	-.248***	-.396, -.099
Illusion of control	.272**	.118, .426	.164*	-.007, .334
Number of employees	.184***	.018, .315	.262***	.108, .416
Positive impressions			.092	-.081, .265
Optimism			-.127	-.340, .087
R ²		.282		.307
F		10.212***		6.741***

Note: *p < .10. **p < .05. ***p < .01.

Table 10. Effects of repeated-measures ANOVA on change dimensions

Omitted dimension	Within-subjects effects		Mauchly's test of sphericity	
	F	df	χ^2	df
(none)	13.464***	5, 180	20.706	14
Goal	12.608***	4, 144	13.845	9
Leadership	15.233***	4, 144	14.499	9
Focus	15.881***	4, 148	10.729	9
Process	8.794***	4, 156	19.981**	9
Motivation system	43.270***	4, 304	23.314***	9
Use of consultants	10.465***	4, 144	19.649**	9

Note: **p < .05. ***p < .01.

Table 11. MANOVA on cognitive factors between different levels of outside view

Test statistic	Value	F	df	p
Pillai's Trace	.843	1.670	64, 400	.002
Wilk's Lambda	.370	1.727	64, 382	.001
Hotelling's Trace	1.195	1.783	64, 382	.001
Roy's Largest Root	.647	4.042	14, 100	.000

Table 12. Pearson correlations between significant variables from the post-MANOVA ANOVA test

Variable	1	2	3	4
1. Outside view	–			
2. Goal: Vividness	.219**	–		
3. Focus: Structural beliefs	.303***	.243***	–	
4. Process: Illusion of control	.365***	.304***	.192**	–
5. Beliefs: Intrinsic motivation	.219**	.333***	.017	.392***

Note: **p < .05. ***p < .01.