Champions, converts, doubters, and defectors: the impact of shifting perceptions on momentum for change

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Accepted Version

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THE IMPACT OF SHIFTING PERCEPTIONS ON MOMENTUM FOR CHANGE

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Abstract

Maintaining momentum is a key influence on the ultimate success of large-scale change. In this paper, we develop theory to explain how stable vs. shifting change-supportive perceptions over time differentially influence the perceived momentum associated with goal-directed change (i.e., change-based momentum). We use cross-level polynomial regression and data obtained early and one year later within an organization implementing a lean manufacturing transformation to model changes in individual perceptions. Results suggest that momentum perceptions are higher for "Champions" (stable and high perceptions over time) as compared to "Converts" (increasing perceptions over time), but momentum perceptions are lower for "Defectors" (decreasing perceptions over time) as compared to "Doubters" (stable and low perceptions over time). We find that even if participants converge upon change-supportive perceptions later in the change process, early divergent perceptions influence subsequent momentum for the change. These findings highlight the important role of temporal shifts in perceptions for organizational change processes.

Keywords: change-based momentum; organizational change; shifting perceptions; time; cross-level polynomial regression

Maintaining momentum is considered an essential ingredient for transformational change (Elmes & Wynkoop, 1990; Senge, Kleiner, Roberts, Ross, Roth, & Smith, 1999). Defined as the socially-perceived energy associated with pursuing goal-directed change (Jansen, 2004), change-based momentum reflects the enthusiasm and intensity of activity of a long-term change effort (Jick, 1995). Sustaining momentum over time is critical to both interim performance (Vallerand, Colavecchio & Pelletier, 1988) and the ultimate success of a change initiative (e.g., Greenwood & Hinings, 1988; Nutt & Backoff, 1997). However, despite the importance of momentum for the successful implementation of change initiatives, we know little about the factors that influence change participants' perceptions of momentum.

Research suggests that momentum is higher when individuals maintain positive views of change (Jansen, 2004; Neubert & Cady, 2001), such as being committed to the change program (Narine & Persaud, 2003) or seeing the change as personally beneficial (Holt, Armenakis, Feild, & Harris, 2007). Although the change literature classify some change participants as change champions (Chrusciel, 2008; Nadler & Nadler, 1998; Ginsberg & Abrahamson, 1991) or naysayers (Kotter & Rathgeber, 2005; Stanley, Meyer & Topolnytsky, 2005), it may be unreasonable to expect that change perceptions remain stable over the course of change.

In fact, in developing theory about ambivalence and responses to change, Piderit (2000) suggested that *shifts* in attitudes over time may be more useful in predicting change success than static perceptions. Empirical evidence shows that change perceptions do indeed shift over time (e.g., Bentein, Vandenberg, Vandenberghe, & Stinglhamber, 2005; Elias, 2009; Meyer et al., 2007; Vandenburg & Self, 1993), likely because change efforts require individuals to engage in sensemaking activities as the process unfolds (Bartunek, Rousseau, Rudolph, & DePalma, 2006; Ford, Ford, & D'Amelio, 2008; Isabella, 1990). Thus, it is reasonable to expect that some

individuals who initially support a change may subsequently resist it, and others who are at first reticent about the change may later embrace it. Although we know that support of a change may shift over time, we do not know how these changing perceptions may differentially influence momentum. Given that momentum is critical for the success of change efforts, understanding how shifting change-supportive perceptions influence momentum can provide important insights for better managing long-term change efforts.

In this study, we develop theory to explain how shifts in two prevalent and well-studied perceptions (i.e., change commitment and personal valence) influence momentum perceptions. Because current experiences are typically understood within the context of past experience (cf., Ancona, Goodman, Lawrence, & Tushman, 2001; Bluedorn & Denhart, 1988; Lewin, 1943; Murray, 1938; Rousseau & Fried, 2001; Weick, 1979), individuals with identical perceptions today but differing *histories* may have different reactions to how these experiences unfold over time (Caplan, 1983). That is, we propose that even if two individuals eventually arrive at similar perceptions during a change program, a shift in perceptions (compared to stable perceptions) may differentially impact their current views of momentum. We empirically test our theory using data collected at two points in time from a manufacturing company in the midst of a lean transformation, a setting where individual buy-in and participation are particularly critical to successful implementation (Bowen & Youngdahl, 1998; Gagnon & Michael, 2003; Lawler, 1994; Worley & Doolen, 2006).

MOMENTUM FOR CHANGE AND SHIFTING PERCEPTIONS

Momentum is a popular (and often taken-for-granted) concept that has been the focus of attention in many academic disciplines including sociology (Adler, 1981; Snow, 1987; Snow & Brissett, 1986; Zald & McCarthy, 1979) and psychology (Kerr, MacCoun, Hansen, & Hymes,

1987; Mace and colleagues, 1988, 1990, 1992; Nevin, Mandell, & Atak, 1983; Vallerand et al., 1988). Within the organizational literature, momentum has been conceptualized in two ways: the energy associated with maintaining a prior course of action on behalf of the organization (stasis-based) or the energy associated with pursuing a new course of action (change-based). The majority of research has adopted the former conceptualization, focusing on strategic persistence (Amgurgey, Kelly, & Barnett, 1993; Miller & Friesen, 1980) and repeating past successful actions (Haveman, 1992; Levitt & March, 1988; Miller, 1993; Tushman & Romanelli, 1985). This conceptualization follows the axiom that "past behavior is the best predictor of future behavior." Research in this vein has focused on the strategic decision-maker creating momentum (Dutton & Duncan, 1987) or repeating prior strategic actions (e.g., Amburgey et al. 1993; Ginsberg and Venkatraman, 1995).

In contrast, the latter perspective conceptualizes momentum as the energy (i.e., a positive force of motion) associated with pursuing a new course of action for the organization (Jansen, 2004). Here momentum is understood as dynamic, fluctuating in reaction to interim progress and social interaction (Gioia & Chittipeddi, 1991; Isabella, 1990; Quinn, Spreitzer, & Lam, 2012). Change-based momentum has been operationalized as both an organizational-level construct manifested in organizational-level communications conveying urgency, feasibility, and progress (emphasizing change leaders), and as an individual-level perception of the collective energy toward an organization's pursuit of a particular change goal (emphasizing change participants; Bartunek et al. 2006). Change participants are particularly important to consider because the implementation of a change leader's decision may be thwarted without the support of individuals on the front line (Armenakis, Harris, & Mossholder, 1993; Eby et al., 2000; Vakola, 2014).

Momentum is related to but distinct from change readiness and change commitment. Change readiness emphasizes one's beliefs and attitudes about the need for, and the organization's ability to make, the proposed changes, which is seen as a cognitive precursor to resistance or support (Armenakis et al., 1993; Rafferty et al., 2013). Change commitment reflects an individual's dedication to, and broad-based support for, the change initiative (Herscovitch & Meyer, 2002; Neubert & Cady, 2001). Momentum focuses on the perceived energy of the change implementation once the change is underway, acting as a barometer of intensity of effort, progress and timely completion (Jansen, 2004; Dutton & Duncan, 1987).

While these change attitudes and momentum variables are likely to be correlated to some extent (e.g., one may be more likely to perceive momentum when committed to the change), perceptions of momentum can be low even if overall readiness or commitment are high, or they can be high even in the absence of readiness and commitment. For example, if a university were to begin offering many online classes, some professors would not be ready or support such a change. But they may observe that their university is making progress and garnering resources to enact such a change. Further, these are temporally distinct constructs in that readiness is often considered a precursor to change commitment (Walker, Armenakis, & Bernerth, 2007), which, in turn, can positively impact momentum perceptions (Jansen, 2004).

Practitioners hold that ultimate change success (or failure) rides on the ability to sustain momentum over time (e.g., Buchanan et al., 2005; Jick, 1995; Reisner, 2002). However there has been limited research on the factors that influence momentum perceptions. For example, research suggests that social information, attentional focus, and perceived commitment to the change positively influence momentum perceptions (Jansen, 2004), while the intensity with which individuals experience emotions (Gross & John, 1998) is positively associated with variance in

reported momentum (e.g., higher highs and lower lows; Jansen & Hofmann, 2011). Of particular relevance are two findings regarding stakeholder groups. First, Jansen (2004) found that change participants' initial divergence with change goals (based on subgroup membership) was negatively related to subsequent momentum perceptions. Specifically, the greater the initial disparity in alignment with the goals of the change program (cf. Boswell & Boudreau, 2001; Gagnon, Jansen, & Michael, 2008), the lower the perceived momentum. Second, Nelson & Jansen (2009) found that variance across stakeholder perceptions of momentum decreased as momentum increased and progress was made.

These findings highlight the social perception processes associated with momentum and imply that different starting conditions in various change-relevant perceptions could differentially influence perceived momentum, even if these perceptions subsequently converge. In other words, we contend that beyond current levels of change-supportive perceptions, shifts in these perceptions from the past may also influence perceptions of change-based momentum (cf. Hofmann, Jacobs, & Baratta, 1993; Irving & Meyer, 1994), which helps us to understand how leaders can use momentum to their advantage during change implementation. Thus, research is needed to understand how reported momentum differs when change participants experience a shift or remain stable over time in their perceptions of a change.

To address this research question, we first develop a typology of four perceptual patterns that are likely to be observed among change participants during organizational change based on a) whether individuals' perceptions of the change are supportive, and b) whether these perceptions are stable over time. As seen in Figure 1, crossing these two dimensions creates four patterns: two stable patterns (Champions and Doubters) and two shifting patterns (Converts and Defectors). The concepts of Champions and Doubters have been well-established in the literature

(Ginsberg & Abrahamson, 1991; Kotter & Rathgeber, 2005; Stanley et al. 2005; Nadler &

Nadler, 1998). Champions are those who maintain consistent support for a change from

inception to completion. They are often the early adopters and more deeply involved with the

change, perhaps even taking on key roles within the change process to influence others

(Chrusciel, 2008). Doubters, on the other hand, are those whom Kanter (2003) describe as the

third of change participants who cannot or will not take action in support of the change. The

Doubters may have low expectations about the ultimate effectiveness of the change (Gaertner,

1989; Rodell & Colquitt, 2009), or may resist change and new experiences altogether, regardless

of change efforts (Devos, Buelens, & Bouchenooghe, 2007; LePine, Colquitt, & Erez, 2000).

Insert Figure 1 about here

In contrast, much less attention has been given to the two sets of individuals who shift

their perceptions during a change process (i.e., the ebb and flow of sentiments; Zald & Ash,

1966). In particular, we know little about how such affective shifts influence perceived change-

based momentum, that is, the perception of whether the energy surrounding an organizational

change is building and more likely to succeed versus waning and more likely to fail. Converts

are individuals whose change-supportive perceptions have shifted from low to high, perhaps

because they have been won over by change efforts (Jarzabkowski & Sillince, 2007; McKenzie,

Truc, & van Winkelen, 2001). They may have been sitting on the fence (Kanter, 2003), waiting

for key events or actions to occur before fully supporting the change effort. Defectors, on the

other hand, are those individuals whose support shifts from high to low. These individuals may

have been disappointed when expectations about the change were unfulfilled (Louis, 1980;

Robinson & Rousseau, 1994) or when new information learned in the change process led to an

erosion of commitment (Gaertner, 1989; Parker & Grandy, 2009).

We contend that these four patterns of reactions among change participants differentially impact views of momentum. In the section that follows, we develop theory to compare individuals who ultimately converge on shared perceptions but began with differing perceptions (i.e., those who maintained consistently high or low perceptions of the change versus those who had a shift in their perceptions). Thus, we compare perceptions for Champions versus Converts and for Doubters versus Defectors to determine how stable and shifting change-supportive perceptions differentially influence momentum perceptions.

THE IMPACT OF SHIFTS IN PERCEPTIONS ON MOMENTUM

To develop our hypotheses, we draw on assimilation and contrast effects derived from social judgment theory (Sherif & Hovland, 1961) to explain how stability or shifts in change-supportive perceptions impact momentum perceptions. Social judgment theory, which examines attitude change as a result of a prior attitude, has been applied to a variety of topics such as the effects of stress over time (e.g., Fuller et al., 2003), the effects of prior performance on ratings of current performance (e.g., Sumer & Knight, 1996), and organizational justice perceptions (e.g., Van den Bos, 2002). Social judgment theory contends that one's previous attitudes provide the context in which current attitudes are understood (Sherif & Hovland, 1961). As individuals encounter new experiences, they are faced with a choice of either changing or sustaining their attitudes and perceptions. When a new experience leads to perceptions that are consistent with past perceptions, individuals can be said to "assimilate" the new information into their current views. However, if a new experience leads to perceptions that are substantially different from past perceptions, individuals will "contrast" the two perceptions, creating a temporal comparison that highlights the differences between the two time periods (cf. Albert, 1977).

We apply these psychological principles to an organizational change context to explain how prior versus current perceptions toward the change may differentially impact perceptions of momentum. We focused on two change-supportive perceptions likely to shift over time, particularly in the context of lean manufacturing: change commitment, and personal valence.

Change commitment. Unlike organizational commitment, which reflects a desire, need, and obligation to maintain employment in an organization (Meyer & Allen, 2001), change commitment refers to a dedication to the particular goals of a change effort. We propose that Champions, who commit early and maintain high change commitment over time, will report higher perceived momentum in the organization than Converts (i.e., those who experienced a positive shift in their commitment to the change). Once individuals commit to the change, they are more motivated to accomplish change goals (Locke & Latham, 1991), and attend to activity and momentum for the change around them because they support and identify with the cause. The sooner in the process that individuals commit, the more likely they will accumulate positive feelings toward the change (e.g., Elster & Loewenstein, 1992). In addition, Champions are often those who are tasked to lead aspects of the change and engage more in change-related activities (e.g., Burkhardt & Brass, 1990). Participation in planning and implementing change creates a sense of agency and control (Armenakis & Bedeian, 1999). Research suggests that those who are more active participators in change report higher acceptance of the change and exhibit greater support for the change (Coyle-Shapiro, 2002; Steel & Lloyd, 1988). Frequent exposure to other change leaders championing the change and involvement in the behind-the-scenes aspects of the process make interim progress and forward movement more noticeable over time, which is likely to be reflected in the perception that the change has more positive momentum or forward progress than others may observe.

Although Converts are also likely to perceive a high level of momentum after they convert, they have not had as much time to accumulate support and attend to progress as the Champions (e.g., Barker & Currie, 1985; Dutton & Duncan, 1987). Converts also have the potential lingering effects of their prior negative views about the change (cf. Brown, Venkatesh, Kuruzovich, & Massey, 2008) and may spend time shedding previously-held beliefs about the change (Chapman, Wong, & Smith, 1993). Despite the fact that Converts may now believe in the change initiative, their delayed support may mean that they have been less privy to the sources of information seen by Champions that would contribute to perceptions of energy and forward progress (Barker & Currie, 1985), and fewer opportunities than Champions to share their perceptions about the change. Thus, we predict that Champions will assimilate their commitment over time, allowing their continuously high level of commitment to accumulate into a greater perception of momentum as compared to Converts.

In contrast to the pattern for Champions and Converts, we predict that Defectors (i.e., those who have experienced a decrease in commitment over time) are likely to perceive less momentum for the change than Doubters (i.e., those who remain uncommitted to the change). Doubters may hold a consistent "wait-and-see" approach to the change effort. Such constancy in attitude can be reassuring and stabilizing to Doubters in the midst of change. Yet, these Doubters are unlikely to perceive much momentum at any point in time, because they consistently believe that the change is not worth supporting and thus, not going anywhere.

However, for Defectors, the loss of commitment may be the direct result of change-related events, which likely implies increasing frustration or disillusionment with the change. Losing previously committed individuals can be dangerous for organizational change efforts, as most efforts at gaining buy-in for the change occur early in the change process (Kotter, 1995).

Thus, when Defectors shift their perceptions, the contrast effect highlights the loss of

commitment and a shattering of their earlier perceptions for what the change would entail. This

perhaps implies that Defectors wrongly supported the change in its early stages. To combat the

inevitable cognitive dissonance and disconfirmation of earlier expectations (Brown et al., 2008;

Festinger, 1957), Defectors are likely to cope by perceiving that the situation has changed for the

worse and that the change now has less positive momentum. That is, they can distance

themselves from the change effort by perceiving that the change is not worthwhile and will

eventually die out. Therefore, we predict that perceived momentum will be lower among

Defectors in comparison to Doubters.

> *Hypothesis 1a: Perceived change-based momentum will be higher when change commitment has been <u>consistently high</u> over time than when it has increased over time.*

> *Hypothesis 1b: Perceived change-based momentum will be lower when change commitment has <u>decreased</u> over time than when it has been consistently low over time.*

> ***Personal valence.*** When first exposed to an organizational change, individual

participants are often encouraged to identify or recognize some positive outcome (e.g., outcome

expectancies, Bandura, 1986) or personal valence (Holt et al., 2007) to be obtained from

successfully completing the change initiative (Coetsee, 1999; Lawrence, 1954). Change does not

affect every individual unilaterally; thus, some individuals will perceive the change as

benefitting them greatly whereas others will perceive little personal benefit, even if they are

committed to the change (Roskies, Liker, & Roitman, 1988). Further, these perceptions of

valence can change over time as individuals gain information and experience with the change.

We reason that the consistently high personal valence among Champions is likely to lead

to higher perceptions of momentum than among Converts. Research suggests that the greater an

individual's personal valence, the more likely the individual will increase readiness (Armenakis

& Harris, 2002; Armenakis et al., 1993), commit to the change, and take action in support of the change (Schneider, 2002). We predict that, because Champions have acknowledged the opportunity for personal gain from implementing the change from the start, their perceptions of personal valence accumulate over time, creating an assimilation effect that contributes to a reinforcing cycle of progress and momentum. Champions are also more involved in the change effort, and this level of participation has been shown to be positively related to perceived benefits in a lean manufacturing context specifically (Coyle-Shapiro, 1999).

Converts initially start by assessing the change as less beneficial and perhaps not worthwhile; therefore, they may perceive the change as having less momentum because these earlier beliefs may linger (cf. Brown et al., 2008). Lacking personal valence initially could make them resistant to change efforts and unlikely to take action early in the change process (Armenakis & Harris, 2002; Armenakis et al., 1993; Schneider, 2002), which means they may perceive less forward movement and energy. Thus, given that some time must transpire before they see that the change is actually valuable to them, their perceptions of momentum will be lower than the Champions whose beliefs about personal valence accumulate over time.

Alternatively, if an individual's personal valence decreases over time (Defectors), it is likely to have more of an adverse impact on momentum perceptions than a stable low personal valence (Doubters). We reason that a decrease in perceived benefit for Defectors will draw attention to the loss of something that was once valuable. Conversely, Doubters are those change participants who may never recognize or acknowledge personal benefit from the change (e.g., Kanter, 2001), although they still may see momentum through social interaction and sensemaking activities (Gioia & Chittipeddi, 1991). However, Defectors likely react to perceived or actual changes as the implementation unfolds, using their early experiences as a comparison

standard for later experiences (Parker & Grandy, 2009). As a result, these individuals are more

likely to withdraw their inputs and attention with the realization that the personal benefits they

once perceived have now dissipated. Such a loss of something once valuable can induce feelings

of cognitive dissonance as earlier perceptions of benefit no longer exist (Brown et al., 2008;

Festinger. 1957). To reduce the impact of such cognitive dissonance, Defectors are likely to

perceive a concomitant decrease in momentum as they withdraw from the change and perceive

that the energy surrounding the change is waning (e.g., "This change is going nowhere"). Thus,

we predict that momentum will be lower for Defectors than for Doubters.

> *Hypothesis 2a: Perceived change-based momentum will be higher when the personal valence of the change has been <u>consistently high</u> over time than when it has increased over time.*

> *Hypothesis 2b: Perceived change-based momentum will be lower when the personal valence of the change has <u>decreased</u> over time than when it has been consistently low over time.*

METHOD

To test these hypotheses, we gathered data at two points in time from production

employees in a relatively large kitchen cabinet manufacturing company, which had recently

embarked upon a transformational change to lean manufacturing. As in most large-scale change,

individual buy-in and commitment are necessary for lean transformations, but not always

obtained (e.g., Gagnon & Michael, 2003). Lean initiatives can lead to drastic increases in

productivity while also reducing waste in the form of human effort, space, materials, and time,

but only if significant changes are made by employees throughout the organization (Womack,

Jones, & Roos, 1991). To illustrate the important role individuals play in making lean

manufacturing effective, consider the following example. One of the key principles of lean

manufacturing is minimization or elimination of several forms of waste. Addressing any one of

these involves more than establishing new policies or procedures; it requires individual

engagement and involvement. Waste of motion may mean excess walking to gather needed materials to an assembler, or reworking a semi-finished product due to poor attention to quality to a finisher. Even though the basic tenets of lean require a similar mindset, the means by which to reduce waste will be individually identified and acted upon.

In addition, some individuals view lean systems as having possible negative implications for employees, citing increased work demands and pace with only modest changes in autonomy (e.g., Womack & Jones, 1994; Landsbergis, Cahill, & Schnall, 1999; Parker, 2003). However, there has been conflicting evidence that calls these negative implications into question (Jackson & Mullarkey, 2000). For example, Parker's (2003) longitudinal study of the effects of lean production found that if the initiative was introduced in a manner that enabled workers to perform their tasks better (Adler & Borys, 1996), lean systems can have positive consequences for employees. Combined, this evidence underscores the important role that individuals play, the sometimes negative views of lean they hold (e.g., "mean manufacturing"), and the likelihood that perceptual shifts in commitment or personal valence will help or hurt the transformation effort, making it an ideal setting to study our research question.

Research findings underscore that management support and effective communication are also critical during a lean transformation (Worley & Doolen, 2006). Management at the firm used in our research had invested in training managers on lean concepts through a series of pre-rollout joint planning sessions with union leaders and lean consultants. The company had taken great care to design their lean system such that it would allow production employees to conduct their tasks more effectively through empowerment as opposed to coercion (Adler & Borys, 1996). Ultimately, the lean system was designed not as an assembly line (which can lead to

highly repetitive tasks by employees), but more as a cellular system (cf., Wemmerlov & Hyer, 1989), which required greater emphasis on teamwork and cross-training.

In the four months prior to our first survey administration, management and union leaders had established urgency by communicating to hourly workers the necessity of this strategy in order to reduce costs, increase quality, and boost competitive advantage at a time when foreign competition was entering their product market and domestic competition had already made the transition to lean. The communication team had already created and distributed four monthly newsletters dedicated to providing employees with important information about lean manufacturing, upcoming projects, and status updates. Management also went to great lengths to communicate the benefits of the lean initiative to production employees, including better working conditions, the potential for earning higher wages, and increased freedom to cross-train and build skills in different areas of the facility. Management attempted to make the lean manufacturing strategy highly relevant to the workers, an important first step for generating buy-in and facilitating behavior change (Kotter, 1995).

At Time 1, we invited all 565 employees across two physical plants and two work shifts to participate in our survey and we collected survey data from 499 respondents (response rate $_{Time\ 1}$ = 88.3%). We timed our second wave of data collection (Time 2) approximately one year later for two reasons. First, it coincided with the completion of requisite training and several major milestones of new procedures and processes in the lean implementation. Second, we also surmised that early perceptions of the focal change were not likely to change quickly because of biases that tend to reinforce one's early perceptions (Carlisle & Baden-Fuller, 2004), and the need for first-hand experience with the lean environment before making an informed judgment.

At Time 2, we again distributed our survey to all employees who were willing to participate but only used data from Time 1 respondents. Of the 499 who responded at Time 1, 362 identifiable employees responded at Time 2 (response rate $_{Time\ 2}$ = 72.5%), representing an overall response rate of 64.1% (i.e., N = 362 out of 565)[1]. The matched sample of Time 1 and Time 2 respondents was representative of the overall demographics of the organization. Fifty-eight percent of the matched sample was male, and 70% worked first shift. Respondents had worked for the company for an average of 10.13 years (*s.d.* = 9.79). Ninety-three percent of the sample held at least a high school degree, with 11.3% having some college education.

Procedure

Management fully supported the data collection, granting employees paid time during their work shift to complete the survey. Groups of approximately 50 employees at a time were sent to the company cafeteria by their supervisor to participate in the study if they wished. The research team explained the purpose of the survey (i.e., to help their company and industry to better manage change processes), reinforced that participation was completely voluntary, reviewed the informed consent, and assured the employees that no one from the company would see their responses. In fact, after each survey administration, we made a point to visibly carry completed surveys directly to our locked car. We provided refreshments as an additional enticement. Employees were asked to put either their name or employee number on a tear-away sheet so that their data could be matched with future surveys. The employees were assured that once matched, the identification would be removed. Ninety-four percent of respondents willingly provided this identifying information.

Measures

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[1] Ninety-seven employees from Time 1 had left for various reasons (e.g., 54 quit, 24 discharged, 11 retired, 4 reduction in force, and 4 died), all of which were consistent with company rates of termination for previous years.

Response categories for the measures below were on five-point Likert agreement scales (1 = strongly disagree; 5 = strongly agree). Given our interest in perceptual shifts over time, single source bias in our data is a possibility, yet obtaining such perceptual data from other sources is infeasible (Brannick, Chan, Conway, Lance, & Spector, 2010). Therefore, we made efforts to mitigate this concern in our procedures. First, we included reverse coded items to reduce patterned responding, which is important when agreement response categories are used (Podsakoff, MacKenzie, & Podsakoff, 2012). Second, two of our control variables were obtained from the company's HR system (i.e., a separate source). Third, because stylistic responding should be less likely if our respondents are motivated (Podsakoff et al., 2012), we designed the survey prompts to be motivating to our target audience, management provided employees with paid time off from work to complete the survey, and the research team provided refreshments. Finally, the temporal separation between our survey administrations (Ostroff, Kinicki, & Clark, 2002) and the use of polynomial regression and higher-order terms (Siemsen, Roth, & Oliveira, 2010) have been shown to be effective means for mitigating response bias.

We assessed participants' change commitment using Neubert and Cady's (2001) six-item measure of program commitment (Time 1, α = .89; Time 2, α = .86). Program commitment is distinct from organizational and goal commitment constructs because it focuses on attachment to the specific change program within an organization rather than global attachment to the organization, and emphasizes overall goals of the change program rather than individual performance goals (Neubert & Cady, 2001). Items included "The principles of this change effort are good goals to shoot for" and "I am convinced we need this change at <company>".

We measured personal valence with five items, created for this study, to assess perceptions of positive and negative outcomes anticipated after successful completion of the

change effort. The content of our items was influenced by Holt et al.'s (2007) personal valence

scale. However, given that their measure had unresolved factor loading and reliability issues, we

sought to design an improved measure. In some cases, this involved making simple wording

changes to a subset of their items, and in other cases developing new items based on knowledge

of lean manufacturing processes and interviews with managers and employees. The one

negatively worded item was recoded and combined with the positively-worded items to reflect a

positively-valenced measure (Time 1, α = .74; Time 2, α = .71). Items all began with the prompt

"Once the lean transformation is complete" and ended with, for example, "I will have acquired

useful new skills" and "I will be better off than I was before this change." A confirmatory factor

analysis of these items demonstrated good fit of the model to the data (e.g., for T_1: RMSEA =

.056, CFI = .99, TLI = .98; for T_2: RMSEA = .065, CFI = .98, and TLI = .96).

Finally, we assessed perceived momentum at Time 2 using Jansen's (2004) six-item scale

(α = .83). Sample items, modified slightly to reflect the specific change initiative, included "The

lean transformation seems to have quite a bit of momentum," and "There doesn't seem to be any

energy associated with <project name>" (reverse-coded). To familiarize respondents with the

concept of momentum, we prefaced the items with the following text:

> You may be familiar with the term "momentum" in describing football games or political campaigns. These events have a certain energy pattern or rhythm that we can all recognize. Organizations can experience this same momentum, especially when actively pursuing a goal. Think about the changes within <company> as it broadly pursues the goal of implementing lean manufacturing as you respond to the items below.

Control Variables

We included one individual-level control variable and two contextual controls in our

analyses to address other factors that might influence individual perceptions.[2] First, we

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[2] Following recommendations by an anonymous reviewer, we controlled for gender, job role, and seniority. None of these variables significantly predicted perceptions of momentum, nor did they change interpretation of the results

controlled for an individual's openness to experience, with the logic that individuals who enjoy change and new experiences might be more likely to be Champions. We also included two contextual variables (shift and plant) obtained from the HR system into our analyses. First-shift employees may be more committed to the change than second shift employees, perhaps because more of the change leaders and supervisors work first shift and the change is more visible. Second-shift employees may self-select to that shift for the pay differential or the generally quieter environment it provides. Further, although the two physical plants were adjacent to each other and were both experiencing change, some job functions differed across the two plants, as they were sequentially interdependent, with Plant A providing raw materials and inventory to Plant B. This also means that Plant A may have differing perceptions given that they were more broadly impacted by some of the early changes (e.g., Plant A encountered more of the lean manufacturing changes first as their work preceded that of Plant B).

Analytic Approach

Although the best-known technique for measuring change over time is calculating simple difference or change scores (e.g., $T_2 - T_1$), there are well-documented problems with this approach (Cronbach & Furby, 1970; Edwards, 1994, 2002; Edwards & Parry, 1993). The employment of difference scores requires that several assumptions are met, including the variables of interest have high reliability, unequal variance, and low correlations (Bergh & Fairbank, 2002; Edwards, 2001, 2002), an often difficult set of criteria to meet when using repeated measures to measure change. In addition, although scholars have suggested that three or more waves of data are ideal for analyzing change over time (e.g., Chan, 1998; Ployhart &

from our focal variables. Therefore, to retain power (i.e., an important concern when testing higher order terms such as those in our polynomial equation), we did not include these variables in our analyses.

Vandenberg, 2010; Singer & Willett, 2003), there are times in which only two data points may be theoretically meaningful (e.g., before and after a change) or readily available from a data site.

To address these analytic concerns with difference scores and to demonstrate a method that could provide nuanced interpretations of a two-wave dataset, we chose polynomial regression and response surface methodology (cf. Edwards, 2002) to test the proposed hypotheses. Although this technique has most often been utilized in research examining the impact of congruence, or agreement, between two variables on a dependent variable (e.g., Kristof-Brown & Stevens, 2001; Livingstone, Nelson, & Barr, 1997; Slocombe & Bluedorn, 1999), it is also useful for studying differential effects of disagreement on some outcome variable (Edwards & Rothbard, 1999) and the impact of differences over time (i.e., repeated measures) on a dependent variable (Edwards, 1995). Given that the polynomial regression approach simply compares the effects of two independent variables on a dependent variable, it is also applicable to a change context where the independent variables represent change scores at Time 1 and Time 2 (Edwards, 2002).

In addition, polynomial regression allows for the simultaneous examination of linear and curvilinear effects (Edwards, 2001, 2002). The technique requires regressing the dependent variable on the set of five regression terms (e.g., the independent variable at T_1, the independent variable at T_2, the squared term of the T_1 variable, the interaction term of the T_1 and T_2 variables, and the squared term of the T_2 variable) using the following equation:

$$DV_{T2} = b_0 + b_1 \, IV_{T1} + b_2 \, IV_{T2} + b_3 \, IV_{T1}^2 + b_4 \, IV_{T1}*IV_{T2} + b_5 \, IV_{T2}^2$$

Although not shown in this equation, we also included the three control variables prior to estimating the effects of the focal independent variables. Because individuals are conceptually nested within shifts and plants, we employed cross-level polynomial regression (i.e., a

combination of hierarchical linear modeling and polynomial regression; Jansen & Kristof-

Brown, 2005) to parcel out the variance associated with the organizational-level control

variables. Specifically, shifts were nested within plants as level-2 and level-3 predictors, while

openness to change and the polynomial terms described above were level-1 predictors. Finally,

we used response surface methodology (cf. Khuri & Cornell, 1987) to help describe and test

features of the three-dimensional surfaces corresponding to the polynomial regression equations

(Edwards, 2002). To facilitate interpretation of the equations and the surfaces, all variables were

scale-centered before conducting the analyses.

RESULTS

Descriptive statistics and correlations for all measures are reported in Table 1. Coefficient

alphas are reported on the diagonal. We conducted a confirmatory factor analysis with the full set

of measures used in this study.[3] Results provide further evidence of construct validity, with

satisfactory factor loadings and fit indices (RMSEA=.058; CFI=.96; TLI=.96). We tested two

alternate models to see if they fit the data better. The first model collapsed all items within each

time period to load onto the same factor (i.e., to see if responses within each time period were

more similar than across periods). Fit of the model worsened substantially with a significant

change in chi-square $[\Delta\chi^2_{(df=20)} = 1374.87]$ and fit indices that reflected poor fit (RMSEA =

.095; CFI = .88; TLI = .88). A second alternative model was then tested in which items were

collapsed across time such that one factor for each construct represented the items from both T_1

and T_2 (i.e., to see if the T_1 and T_2 variables were distinct as would be expected over the course

of a change implementation). This model also indicated worse fit as compared to our theoretical

model with a significant change in chi-square $[\Delta\chi^2_{(df=15)} = 915.74]$ and fit indices that reflected

poor fit (RMSEA = .084; CFI = .91; TLI = .91). Thus, we retained our theoretical model with

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[3] Details on these analyses are available from the first author upon request.

separate constructs for T_1 and T_2 variables. These results add to discriminant validity evidence

reported in (Jansen, 2004), and demonstrate the distinctiveness of our three main variables.

Insert Table 1 about here

To test our hypotheses, we first hierarchically regressed momentum at T_2 on the set of

three control variables, then on the focal construct (change commitment or personal valence) at

T_1, then on T_1 and T_2, and finally on the set of five terms specified in Equation 1. If the set of

higher order terms explained significant incremental variance over T_1 and T_2, then curvilinear

effects or slope differences were indicated, and the surface was graphed. We employed a strategy

outlined in Edwards and Rothbard (1999) for testing differences between points on the surface.

For example, for testing Hypotheses 1a and 1b, we calculated a z-score when the T_1 and T_2

predictors were one standard deviation above the mean (i.e., within the Champions quadrant),

and a second z-score when T_1 was one standard deviation below the mean and T_2 was one

standard deviation above the mean (i.e., within the Convert quadrant). Statistical significance of

the difference in momentum at these two points was determined using procedures for testing

linear combinations of regression coefficients (Cohen & Cohen, 1983).

Insert Table 2 about here

Hypothesis 1 predicted that perceptions of momentum for change would be (a) higher

among those whose change commitment had remained stable and high (e.g., Champions) than

among those whose perceptions had shifted from low to high (e.g., Converts), and (b) lower

among those whose change commitment had shifted from high to low (e.g., Defectors) than

among those whose perceptions had remained stable and low (e.g., Doubters). As shown in Table

2, regression results show that two of the three higher order terms were statistically significant,

and the inclusion of the set of higher order terms explained additional variance in the model. We therefore graphed the surface plot depicted in Figure 2.

To interpret the surface plot, we examined the *line of stability*[4] and the *line of change.* The line of stability reflects individuals whose perceptions remained stable across the two time periods, whereas the line of change reflects individuals whose perceptions changed. The line of stability extends from the point closest to the reader (the stable-low quadrant, labeled Doubters on the graph floor) to the point most distant from the reader (the stable-high quadrant, labeled Champions on the graph floor). The characteristics of the surface graph (i.e., slopes and curvatures) were calculated using procedures described in Edwards (2002), and are reported in Table 2. Results reveal a significant positive slope along the line of stability. This slope indicates that, consistent with prior research, commitment to the change is positively associated with momentum perceptions.

The line of change extends from the left side of the figure, where change commitment was higher at T_1 and lower at T_2 (Defectors), to the right side of the figure, where change commitment was lower at T_1 and higher at T_2 (Converts). There is also a significant positive slope along this line, revealing that momentum is higher when commitment to the change is increasing (i.e., a positive shift) rather than decreasing (i.e., a negative shift). Beyond these descriptive characteristics of the surface graph, we were primarily interested in the relationship between Champions versus Converts, and Defectors versus Doubters. The surface graph provides some visual evidence of a decreasing slope along the surface from the Champion quadrant to the Convert quadrant, and an increasing slope from the Defector quadrant to the Doubter quadrant. To empirically test this hypothesis, we examined mean differences between

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[4] In fit research, the line of stability is referred to as the "fit line," where person and environment are equal, and the line of change is referred to as the "misfit line," where person is unequal to the environment (Edwards & Parry, 1993). Given our emphasis on change rather than fit, we adapt the terminology to apply to our domain.

the calculated z-scores for momentum in each quadrant. Results show that momentum was significantly higher among Champions (3.48) than among Converts (3.25, $p < .05$), and significantly lower for Defectors (2.62) than for Doubters (2.74, $p < .05$). Therefore, both Hypotheses 1a and 1b were supported.

Insert Figure 2 about here

Hypothesis 2 predicted that perceptions of momentum for change would be (a) higher when personal valence was stable and high (Champions) than when it had shifted from low to high (Converts), and (b) lower when personal valence had shifted from high to low (Defectors) than remaining stable and low over time (Doubters). Table 2 reports that all three of the higher order terms were significant, and their inclusion explained additional variance in the model. We therefore graphed the surface plot.

The surface depicted in Figure 3 shows that momentum was highest when personal valence was stable and high. Further, there was a significant positive slope along the line of stability, illustrating a positive relationship between personal valence and momentum. Along the line of change, momentum was higher when personal valence was increasing rather than decreasing. There was also visual evidence for a decreasing slope along the surface from the Champion quadrant to the Convert quadrant, and an increasing slope from the Defector quadrant to the Doubter quadrant. Mean differences in the calculated z-scores show that momentum was significantly higher among Champions (3.23) compared to Converts (3.04, $p < .05$) and significantly lower among Defectors (2.44) when compared to Doubters (2.60, $p < .05$). Thus, Hypotheses 2a and 2b were supported.

Insert Figure 3 about here

DISCUSSION

Momentum is a critical component of successful change programs because it contributes to progress and ultimate goal attainment (Greenwood & Hinings, 1988; Jick, 1995). Yet to date, few studies have examined what predicts momentum and specifically how the occurrence of shifting perceptions among change participants impacts perceptions of momentum. This is a particularly important issue given that change processes are inherently dynamic and depend upon the change participants' and change leaders' efforts to sustain organizational change efforts (Armenakis et al., 1993; Kotter, 1995). In this study, we examined how shifts in two change-supportive perceptions (change commitment and personal valence) differentially impacted change-based momentum perceptions. By focusing on individuals' experience of change (e.g., Bartunek et al., 2006), we highlighted the important role that individual perceptions play in the resulting level of momentum for change.

In general, our results suggest that change-based momentum perceptions are higher when an individual's change-supportive perceptions are stable and high (rather than shifting from low to high) over time. In contrast, momentum perceptions were lower when change-supportive perceptions shifted from high to low (rather than stable and low) over time. In other words, Champions perceived higher momentum than Converts, and Defectors perceived even lower momentum than Doubters. This suggests that the sooner that individuals recognize personal benefit from the change and commit to it, the greater the momentum. Alternatively, contrary to the well-known adage that "it is better to have loved and lost than to have never loved at all," findings from this study suggest that losing change commitment or the perception of personal benefit is actually more harmful than never having them. Overall, our findings imply that to effectively manage momentum for change, change leaders must attempt to establish positive change-supportive perceptions early and make efforts to sustain them over time. This is

particularly true because those who become disenfranchised (i.e., Defectors) with the change process adversely impact momentum and may be much harder to win back, a point which we will return to in the practical implications section.

We believe this study makes three important contributions to change research. First, this study builds upon qualitative research on shifting perceptions over time (Isabella, 1990) by developing a theoretically-driven typology of typical perceptual patterns found during change. In doing so, our study draws attention to the under-explored shifting patterns of Converts and Defectors. On average, 30% of our sample shifted their perceptions across the two time periods and had unique reactions to organizational change efforts that would have been missed with traditional analysis of means over time.

Second, our results suggest that temporal context matters. Although individuals may perceive the same level of a change-supportive characteristic one year into a long-term change process, such a snapshot of their current views does not fully account for the relationship between that perception and perceived momentum. Instead, perceptual shifts over time also matter. More broadly, our results underscore that current experience is inherently situated in time (George & Jones, 2000; Johns, 2006; Rousseau & Fried, 2001), and perceptions about change processes are created with and influenced by an understanding of what has come before (Weisbord, 1988). By incorporating perceptual shifts into change theory, we acknowledge the important influence they have on attitudes and behavior (e.g., Avital, 2000).

Third, this study examined temporal shifts in change variables using cross-level polynomial regression and response surface methodology, which provides useful insights into an alternative approach for analyzing repeated measures and change over time. Polynomial regression and response surface analysis provide information about the relationship between

stable and shifting change perceptions and outcomes, and allow us to visually depict them to gain a better understanding of the overall relationship. This analytic approach also permits researchers to more readily discern patterns in the results, a characteristic that can help research on change move beyond a study of differences (Weick & Quinn, 1999) to theoretical patterns (e.g., Van de Ven & Poole, 1995). As change process research continues to increase in popularity, methodologies that capitalize on changes over time will become more critical. Although we acknowledge that, in general, more data points are better when studying experiences over time (Chan, 1998; Ployhart & Vandenberg, 2010), there are times in which only two data points may be theoretically meaningful or practically available from a data site. This methodology provides nuanced interpretations of outcomes that result from perceptions at two key points during a change process, and as an added benefit, the higher order terms used are not susceptible to method inflation (Siemsen et al. 2010). It should be noted, however, that method bias can actually *deflate* quadratic and interaction effects (Podsakoff et al., 2012), so sample size may become a significant issue when using this approach.

Limitations and Future Research

As with any study, there are limitations that should be recognized. This research was conducted in one organization and in one change context (lean transformation), which may ultimately limit the generalizability of these results. However, underlying this change are common motives of flexibility (i.e., producing new products in new ways) and efficiency (doing more with less). Both of these motives can be accomplished in other settings. At a broader level, lean manufacturing involves changing employee attitudes and the culture of the organization to sustain a new strategic direction, characteristics common to most change efforts.

Although we believe that the use of polynomial regression and response surface analysis are a strength of this study, it is important to recognize that the size of each polynomial regression model required us to test each change characteristic in separate regression equations, which prevented us from observing potential multivariate relationships among the different predictors. However, we ran a post hoc regression analysis including the control variables and both change characteristics at Time 2, while controlling for their values at Time 1. Both remained significant predictors, providing some reassurance that the effects are robust when analyzed in combination.

Further consideration of how particular change characteristics may operate differently in the realm of gains (i.e., Converts) versus losses (i.e., Defectors) may be merited (cf. Gaertner, 1989). It is conceivable that some change perceptions have a short life span, being influential in the moment, but not enduring. This seems to reflect a "what have you done for me lately" point of view that may be at play. There may be certain influences that have a much shorter-term, or temporary, impact on momentum, such as positive emotions (Avey, Wernsing, & Luthans, 2008) or perceived threats (Fugate, Prussia, & Kinicki, 2012). Thus, our results may be most applicable to more enduring change perceptions.

The results of this study suggest that further research is merited on temporal shifts in perceptions over the course of organizational change. Given that momentum perceptions are often vocalized and shared (e.g., "Let's keep building upon this momentum…"), there may be change characteristics that moderate the relationship between stable and shifting perceptions and momentum, such as social influence or network centrality. Research can also examine shifts earlier in the change process in terms of readiness (Oreg, Vakola, & Armenakis, 2011) and engagement (Bunker & Alban, 1997; Shin, Taylor, & Seo, 2012). For example, does engagement

with a change plateau over time? If so, there may be implications for the timing and pacing of these initiatives (Gersick, 1994). Alternatively, future research can study downstream processes by examining the impact that shifting perceptions of momentum may have on organizational outcomes and personal consequences. For example, are shifts in momentum more beneficial than stability in predicting outcomes such as goal attainment or change fatigue? Are there particular stages in a change effort when less momentum is advantageous? A more in-depth focus on these varied perceptual shifts over time can provide valuable insight into these processes.

More broadly, there may be additional shifts beyond those we identified in Figure 1. Our examination of Converts and Defectors corresponds with growth and loss trajectories proposed by Kanfer and Ackerman (2004) in their study of aging. However, they proposed two additional trajectories that may be applicable to change processes. A "reorganization" trajectory focuses on discontinuities over time, and an "exchange" trajectory describes a substitution effect, where one set of issues is replaced by another over time. Although their theorizing was explicitly tied to aging and work motivation, investigation of additional patterns such as these may be fruitful in the study of organizational change.

Finally, although we assessed actual change in perceptions over the passage of time, future research may build upon these ideas by considering retrospected or anticipated change at a moment in time. That is, individuals may perceive even greater changes in momentum depending upon what they remember and forecast about the change initiative. Because of biases in retrospection such as hindsight bias and retrospective rationality (Fischoff & Beyth, 1975; London, 1983; Sanna & Schwarz, 2004), individuals may prefer to consider themselves Champions from the start rather than Converts. As such, they may retrospectively bias their level of commitment higher than it actually was in the past to rationalize the end result of supporting

the change. Similarly, as individuals anticipate future changes, they typically overestimate their reactions to changes (Gilbert, Gill, & Wilson, 2002), forecasting an overly rosy picture of what they expect from future experiences (Mitchell, Thompson, Peterson, & Cronk, 1997). Therefore, they may forecast that they will be Champions rather than Defectors, and perceive momentum accordingly rather than considering how they actually could lose their vigor over time, and decline in their support for the change.

Implications for Practice

Results from this study suggest that losing change commitment or the expectation of positive outcomes is actually more harmful than stable low levels. The implication of this finding for practice is that if a change leader is able to garner commitment and help change participants find benefit from successful implementation, then it is equally important to make efforts to maintain them over the course of change. As we acknowledged in describing stable patterns, effort is required to sustain a course of action. Thus, change leaders should not presume that early commitment implies lasting commitment, nor that committing late is as beneficial as committing early. To sustain momentum during organizational change, the earlier a change leader can obtain commitment and help participants see personal benefit, the better.

More broadly, we noticed several interesting patterns in the averages and overall distributions for this set of change characteristics that have implications for change leaders and managers. For example, although there were significant differences in momentum between Champions and Converts and between Defectors and Doubters, we noted that, on the whole, momentum never reached extremely high levels. One explanation for this may be that the change effort lost steam after the announcement of change and initial implementation efforts (cf. Parker, 2003). This trend underscores the importance of effectively communicating the change message

(Clampitt, DeKoch, & Cushman, 2000; Lewis, 1999) and proactively managing project momentum (Nelson & Jansen, 2009) throughout the change process.

Further, to better understand the contextual implications of our typology, we conducted a post hoc analysis by categorizing individuals' change commitment and personal valence into one of the four categories based on the mean at each point in time (e.g., Champions are at or above the mean at both time periods, whereas Converts are below the mean at T1 and at or above the mean at T2). As shown in Table 3, although such mean splits offer a rough cut to characterizing individuals' perceptions of change, we found some interesting patterns in terms of the number of Champions, Converts, Defectors, and Doubters.

Insert Table 3 about here

First, for change commitment, over 60% of employees were not highly committed to the change a year into the change process (i.e., 36.5% were Doubters and 24.6% were Defectors), suggesting that more work could have been done to communicate the strategic vision to highlight the value of the change for the organization to gain employees' commitment to the change program. On the other hand, for personal valence, the vast majority of employees were Champions (61.6%), seeing the personal benefit of the change early on and sustaining these views over time. Although over a quarter of employees still failed to see a personal benefit a year into the change process (i.e., 11.9% were Doubters and 16.3% were Defectors), the combined number of Champions and Converts suggests that the organization's efforts to outline the positive benefits of the change to employees themselves were largely successful.

Finally, we were surprised that the least common category for employees on either change-supportive perception were the Converts. Despite the fact that the change efforts were designed to create Champions and Converts within the first year, relatively fewer individuals

changed their views of the initiative in a positive direction. This is less of a concern for personal valence given that such a high number began as Champions. But for change commitment, there were many more people who lost rather than gained commitment to the change over time. The obvious implication is that losing support is far more costly in the long run, as our data suggest that change leaders were unable to win back employees. The combination of the response surface graphs and patterns of perception shifts provide a powerful tool for change leaders to better understand some of the underlying dynamics within the change process, providing clear direction on which individuals to target for particular interventions.

Our post hoc findings on the employees in each of the four categories of the typology suggest that managers may need to address different change characteristics in different ways. That is, efforts that influence participants' commitment to the change may be different from the efforts needed to perceive a personal value from the change. These findings suggest that managers may have to not only sustain their efforts over time to gain Converts and avoid losing Champions, but that they also have to split their attention between the various change characteristics. Organizations may need to provide additional training and time for managers to customize their efforts to managing change in such a nuanced way.

CONCLUSION

Our goal in this study was to determine whether temporal shifts in change characteristics mattered. The theory and results suggest that they do indeed matter, and in theoretically predictable ways. We also introduced an analytic strategy from another research stream to aid change researchers in better understanding temporal influence during long-term change. Taken together, our hope is that the theory and methodology for studying such patterns will help researchers be better able to observe patterns when studying change.

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Figure 1
Stable versus Shifting Perceptions in Change-Supportive Perceptions[a]
Among Change Participants
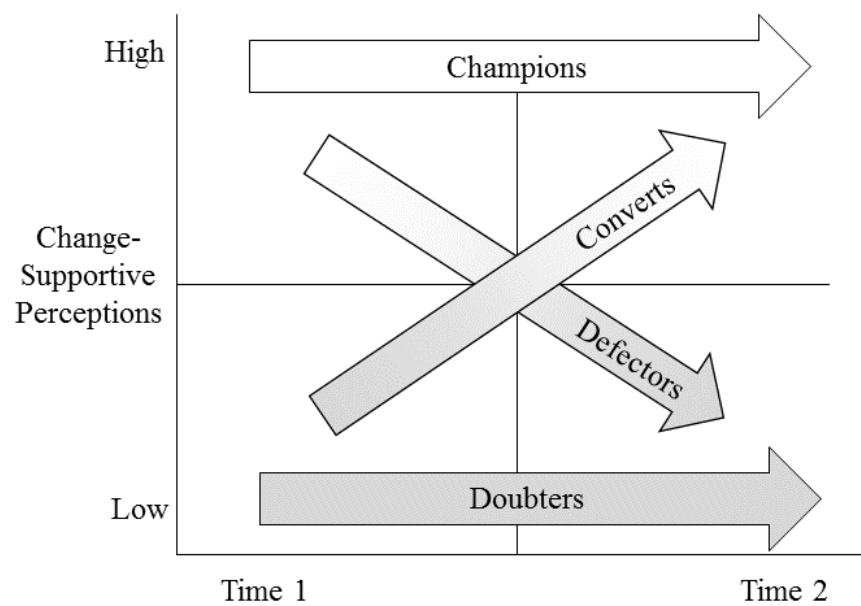
[a] In this study, change commitment and personal valence, but other change-supportive perceptions should apply.

Figure 2
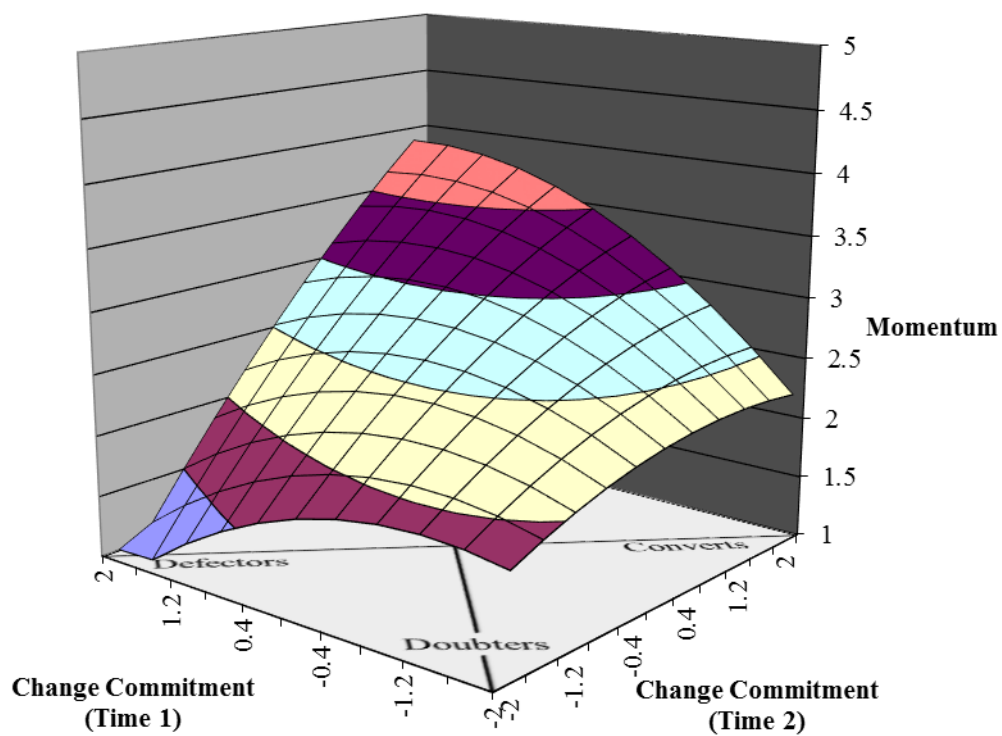**Surface Graph of Change Commitment over Time**
Predicting Momentum

Figure 3
Surface Graph of Personal Valence over Time
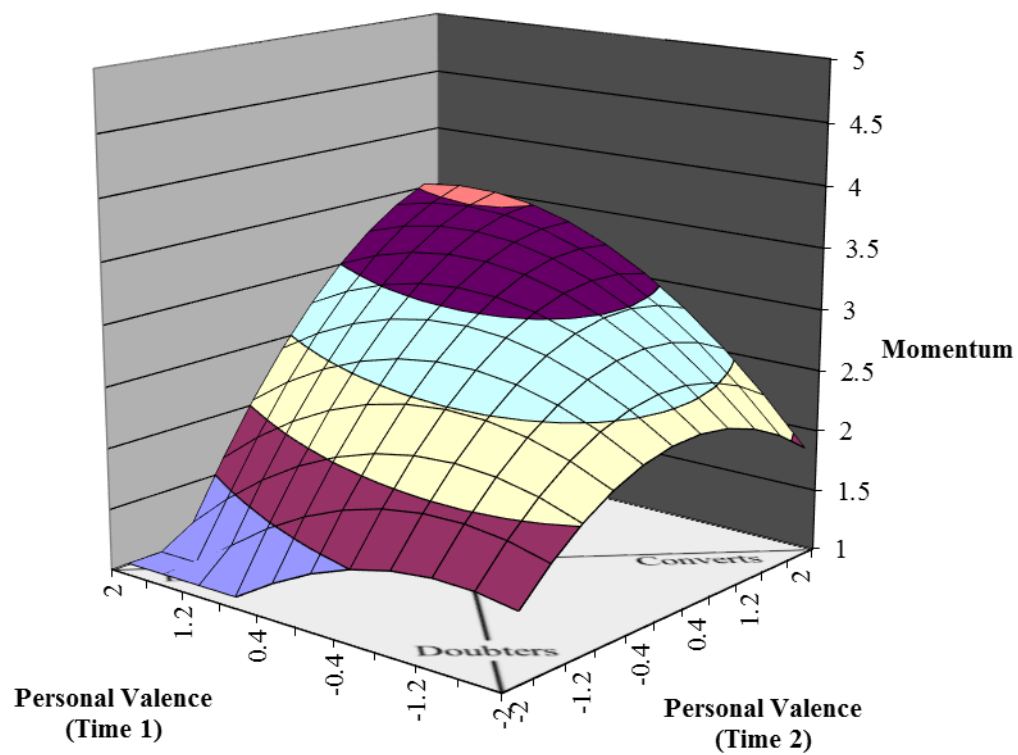**Predicting Momentum**

Table 1
Means, Standard Deviations, Scale Reliabilities, and Correlations
of All Study Variables[a]

	Mean	s.d.	1	2	3	4	5	6	7	8
1. **Shift[b]**	1.29	.46								
2. **Plant[c]**	.60	.49	-.04							
3. **Openness to Experience (T$_1$)**	3.48	.47	.13	.03	(.77)					
4. **Change Commitment (T$_1$)**	3.67	.73	.17	.07	.35	(.89)				
5. **Personal Valence (T$_1$)**	3.10	.68	.14	.06	.32	.53	(.74)			
6. **Change Commitment (T$_2$)**	3.48	.70	.05	-.09	.20	.51	.36	(.86)		
7. **Personal Valence (T$_2$)**	3.00	.65	.07	-.02	.17	.35	.55	.57	(.71)	
8. **Momentum (T$_2$)**	3.22	.64	-.04	-.16	.14	.33	.30	.59	.54	(.83)

[a] N=362; r > .11 are statistically significant, $p < .05$, coefficient alphas reported on the diagonal
[b] First shift was coded as 1, Second shift as 2
[c] Plant A was coded as 0, Plant B as 1

Table 2
Cross-Level Polynomial Regression Results[a]

DV: Momentum at T_2	Total variance explained[b]	Intercept	Control Variables			Polynomial Regression Terms					Line of Stability ($T_1 = T_2$)		Line of Change ($T_1 = -T_2$)	
			Shift[c]	Plant[d]	Open to Experience	T_1	T_2	T_1^2	T_1T_2	T_2^2	Slope	Curvature	Slope	Curvature
Controls	.04*	2.55	.00	.02	.20*									
IV: Change Commitment														
Step 1:	.15*	2.88	.01	.03	.04	.30*								
Step 2:	.35*	2.89	.00	.01	.02	.06	.50*							
Step 3:	.37*	2.81	.01	.01	.06	.07	.44*	-.11*	.17*	-.05	.52*	.01	-.37*	-.33
IV: Personal Valence														
Step 1:	.12*	2.95	.01	.02	.07	.29*								
Step 2:	.31*	2.94	.01	.02	.08	.05	.52*							
Step 3:	.33*	2.93	.01	.02	.10	.02	.47*	-.14*	.19*	-.15*	.49*	-.10	-.46*	-.49*

[a] n=362 individuals matched at two points in time
[b] Total variance was calculated as 1 – (variance of step model / variance of null model)
[c] First shift was coded as 1; Second shift as 2; Shifts were nested within plants for this analysis
[d] Plant A was coded as 0; Plant B as 1
*$p < .05$

Table 3
Post Hoc Typology of Change Participants

	Champion	Convert	Doubter	Defector
Change commitment	29.6%	9.4%	36.5%	24.6%
Personal valence	61.6%	10.2%	11.9%	16.3%