Ability fit, Value fit, and culture fit: Three predictors of individual responses to innovation

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ABSTRACT

Drawing on the person-environment fit literature, we propose that cognitive comparisons between the self and innovation on meaningful dimensions determine organizational members attitudinal and behavioral responses to innovations. Specifically, we hypothesize that three person-innovation fit constructs-value fit, culture fit, and ability fit-predict employees commitment to implementation and implementation behavior. The results, based on data from two electronics companies, showed that value congruence between innovation and person and between innovation and the implementing organization is more strongly related to employees commitment to implementation than their implementation behavior. In contrast, the congruence between abilities required by the innovation and employees current abilities is more strongly related to their implementation behavior than commitment to implementation. This study expands the innovation implementation literature by identifying and testing a plausible cognitive process that determines employees attitudinal and behavioral responses to innovations.

Contemporary organizations are continually reshaping themselves in response to a rapidly changing environment by introducing a greater number of new technologies and business practices more frequently than ever before(Jick, 1995). In this context, understanding how employees respond to an ever-increasing number of innovations is important because employee reactions often determine the ultimate success or failure of implementation efforts(Hartwick & Barki, 1994). Many innovations have failed not because of their technical deficiencies, but due to lack of acceptance and use by organizational members(Klein, Conn, & Sorra, 2001). The present study extends the extant innovation literature by theorizing and empirically testing a psychological mechanism by which employees may shape their responses to innovations. Specifically, we propose that the degree of fit between person and innovation on several meaningful dimensions influences both employee attitudes toward implementing an innovation and their actual behavior in implementing the innovation.

Various factors that determine peoples reactions to a new technology in the form of either adoption and usage or rejection have been a major research agenda for scholars of Information Systems in particular because the success of any information system depends on individual users adoption and usage of it. IS researchers have thus developed several frameworks that account for the process through which individuals develop their cognitive, attitudinal, and behavioral reactions to new information systems, which can also be applied to other types of innovations. For example, the Technology Acceptance Model(Davis, 1989) posits that a persons behavioral intention to use an innovation and actual usage of that innovation are determined by two factors: perceived ease of use and perceived usefulness. Social Cognitive Theory(Compeau, Higgins, & Huff, 1999) endorses a similar set of beliefs including technology self-efficacy and outcome expectations related to use of the technology. Other scholars have utilized various social psychology theories, such as the Theory of Reasoned Action(Fishbein & Ajzen, 1975) and the Theory of Planned Behavior(Ajzen, 1991), to address the issue of innovation adoption and use.

Based on these theoretical frameworks, empirical studies have examined the cognitive processes that determine peoples attitudinal and behavioral responses to new technologies, systems, and other kinds of innovations(Compeau et al., 1999; Hartwick & Barki, 1994; Karahanna, Straub, & Chervany, 1999). In these studies, however, the mechanism through which people form key beliefs that

precede positive attitudes and behavior involving an innovation has often been ambiguous. For example, self-efficacy in relation to a given technology is a critical condition for actual usage of it(Compeau et al., 1999). However, the question remains as to what the psychological mechanism is that engenders a high sense of self-efficacy for a given technology. In another study, it was found that employees are more likely to develop positive attitudes toward a new system when it is characterized by trialability, visibility, and result demonstrability(Karahanna et al., 1999). Nevertheless, these innovation characteristics that make an innovation attractive may not work for individuals who have substantial expertise in the area of the innovation and prefer complicated, but more powerful and versatile, systems to easy-to-use, but less powerful, ones.

As a potential cognitive mechanism that is responsible for forming favorable attitudinal and behavioral responses, we suggest a cognitive comparison of person and innovation in certain characteristics that are meaningful for both person and innovation. It is well known that psychological comparisons of an objects characteristics with related personal characteristics comprise a fundamental mechanism that shapes peoples appraisal of the object and their subsequent behavior regarding it(Festinger, 1957). We expect that individuals will develop positive attitudinal and behavioral responses toward an object when the result of this comparison is favorable(good fit between person and innovation). For example, an employee may develop positive attitudes toward an innovation when it is congruent with her work values or work styles (high fit between innovation and personal values). Conversely, if this comparison produces unfavorable results(misfit between innovation and personal values), individuals will respond in a negative manner. If a person feels that a new system requires substantial technical proficiency that is well beyond his current skill level(misfit between innovation and the persons skill), for instance, his sense of self-efficacy in relation to this system will be lowered, which might lead to negative attitudes toward and non-use of it.

Significance of the Fit Concept for Individual Responses to Innovations

The notion of fit has a long and influential history in the organization science literature(Donaldson, 1996). Initially, structural contingency theorists proposed the concept of fit, arguing that a good fit between organizational structure and contingency factors(e.g., strategy, technology, environment) is crucial for organizational performance(Lawrence & Lorsch, 1967).

Later, the idea of fit was extended to individual-level research on person-environment(P-E) fit, which proposed that a good fit between people and their environment(e.g., job, organization, vocation) on relevant dimensions(e.g., task requirements, organizational culture, vocational characteristics) induces greater commitment, more positive affective experience at work, and enhanced performance(Bretz & Judge, 1994; Kristof, 1996). Researchers have also investigated person-organization fit and its influences on other variables such as intention to leave and successful job interviews(OReilly & Chatman, 1996; Cable & Judge, 1997).

To theoretically explain how people respond to innovations, we draw on the P-E fit literature and propose a new construct, person-innovation fit, referring to the compatibility between person and innovation on meaningful dimensions. We argue that the results of this cognitive comparison between person and innovation determine a persons attitudinal and behavioral responses to a particular innovation. In fact, the notion of congruence or fit between an innovation and its implementing unit is not new. Rogers(1995) included compatibility of an innovation with existing organizational practices as a key factor that increases adoption of the innovation. Moreover, in a recent study, Venkatesh and Davis(in press) showed that favorable attitudinal responses(perceived usefulness) are significantly determined by a high level of congruence between a technologys capabilities and an individuals job requirements. We expand the literature by identifying theoretically meaningful dimensions for comparison between person and innovation and examining their effects on individual-level attitudinal and behavioral outcomes of innovation implementation in organizational settings.

In this study, we refer to an individuals attitudinal response to an innovation as *commitment to implementation* and define it as belief in a particular innovation and willingness to exert considerable effort in its implementation(adapted from Mowday, Porter, & Steers, 1982). We refer to an individuals behavioral response to an innovation as *implementation behavior* and define it as an individuals consistent and committed use of a particular innovation(adapted from Klein & Sorra, 1996). Both attitudes toward an innovation and actual behavior(innovation use) have been regarded as important outcomes of innovation implementation because both outcomes are needed to ensure routinization of an innovation as an enduring part of the organization, even after an initial phase of intensive training, monitoring, and substantial

inducements for innovation use(Karahanna et al., 1999; Rogers, 1995).

Below we identify key innovation characteristics that may provide a basis for comparison between person and innovation. We then develop a set of hypotheses relating the identified person-innovation fit constructs to individuals attitudinal and behavioral responses. The hypotheses are tested using data from two electronics companies.

THREE DIMENSIONS OF PERSON-INNOVATION FIT

We propose that organizational members become committed to and actually perform implementation behavior when they perceive substantial congruence between a particular innovation and themselves on meaningful dimensions. Drawing on the innovation implementation literature(Clayton, 1997; Klein & Sorra, 1996), we identify two innovation attributes that comprise defining characteristics of an innovation and that may shape peoples perceptions of and subsequent reactions to it. The first attribute, *innovation values*, refers to values and goals underlying an innovation as perceived by users (cf. spirit of an innovation, DeSanctis & Poole, 1994). For example, assembly technologies may endorse values concerning the nature of time, space, human beings, and their relationships that are quite different from those endorsed by more flexible manufacturing technologies based on autonomous work teams(Schein, 1992). The second attribute, *required abilities*, refers to skills, knowledge, experience, and technical expertise necessary to implement the innovation(cf. resource requirements, Clayton, 1997). When implemented, each innovation imposes different types and levels of technical requirements for successful usage.

These two innovation attributes can be used as dimensions for person-innovation comparison because values and abilities also comprise key descriptors of individual organizational members. The first comparison, between innovation values and personal values, leads to different degrees of value fit. The second comparison, involving required abilities from the innovation and a persons current abilities, results in different degrees of ability fit.

Finally, we also include a comparison between innovation values and organizational values(i.e., organizational culture) that we refer to as culture fit. This last dimension is included to examine the potential influence of social context, because most theories on innovation use have maintained that individuals adoption and use of an innovation are influenced by social norms, expectations,

and compatibility with what others do(Compeau et al., 1999; Karahanna et al., 1999).

The three P-I(person-innovation) fit constructs embrace the two types of fit identified in the person-environment fit literature(Edwards, 1996; Kristof, 1996). The first type is supplies-values fit(S-V fit), where greater fit is present when the environment provides values that are compatible with a persons preferences or needs. The second type of fit is demands-abilities fit(D-V fit), in which higher levels of fit occur when people have skills, knowledge, and abilities that are required by their environment. In this study, culture fit and value fit represent two kinds of supplies-values fit, whereas ability fit corresponds to demands-abilities fit. Below we describe the three P-I fit constructs and advance hypotheses relating them to individuals attitudinal and behavioral responses to innovations.

Value Fit

Values represent relatively stable beliefs held by individuals about what is good, right, or desirable(Rokeach, 1973). Values influence employees attitude and behavior(Meglino & Ravlin, 1998). Since values prescribe the preferred state of affairs, people are attracted to objects or other people that hold a similar set of values, whereas they feel uneasy with objects or others that carry disparate values(Meglino & Ravlin, 1998). For this reason, when we have a strong value-congruence, we are more likely to form a positive appraisal of the object or person in question(Ajzen, 1991). In addition, engaging in value-congruent behavior requires less cognitive effort than engaging in value-incongruent behavior, which may require resolution of dissonance among values, attitudes, and behavior(Festinger, 1964).

For these reasons, we expect that *value fit*, defined as the congruence between innovation values and personal values, positively influences employees attitudinal and behavioral responses to an innovation. As mentioned above, innovations endorse a particular set of values(e.g., efficiency, precision, team effort, autonomy). Under conditions of high value fit, using an innovation requires a minimum cognitive adjustment and effectively reinforces ones own personal values. We thus hypothesize that employees will be more committed to an innovation and more willing to use it when its values are congruent with their own values.

Hypothesis 1a: The greater the congruence between innovation values

and personal values, the greater the strength of commitment to implementation.

Hypothesis 1b: The greater the congruence between innovation values and personal values, the greater the intensity of implementation behavior.

Ability fit

Implementing new work procedures and technologies requires employees to obtain new skills, knowledge, and experience before they can actually use those innovations(Clayton, 1997). Even when an innovation is carefully designed to be user-friendly(e.g., a graphic user interface), individuals usage of the new system is rarely an automatic process that occurs without any need to learn new skills. To developers surprise, so-called user-friendly systems based on information technologies often turn out to be a puzzle to workers on the shop floor(Zammuto & OConnor, 1992). More often than not, advanced manufacturing technologies based on computerized systems effectively eliminate simple, routine tasks and increase the complexity of the remaining jobs, which in turn require a greater level of user abilities such as computer literacy, clear understanding of the logic behind the system, and procedures to be applied in the case of system failure(Zammuto & OConnor, 1992). In these cases, employees who do not have required abilities such as computer literacy may feel threatened by the new technology and hesitate to incorporate it into their job.

Encountering an innovation that demands certain abilities, employees may engage in a cognitive comparison to size up their current skills against those required by the innovation. When their current ability level is equal to *or* greater than the required level, employees may believe that they can use the innovation without much difficulty(cf. perceived ease of use, Davis, 1989). This perceived feasibility of using the innovation establishes psychological readiness to perform the behavior of innovation use. Specifically, when employees believe they can fulfill the ability requirements of the innovation, they have a high expectation of the link between effort and performance, which increases their motivation toward that behavior(Vroom, 1964). However, when the required ability is too low relative to the currently held ability, individuals may develop negative beliefs regarding the innovation such as boredom and perceived obsolescence, which in turn decreases the attractiveness of the innovation and motivation to use it(Reger, Gustafson, Demarie, & Mullane, 1994). Thus, we hypothesize that employees

develop more positive attitudinal and behavioral responses to an innovation when there is a high fit between abilities required by the innovation and abilities held by the person.

Hypothesis 2a: The greater the congruence between abilities required by an innovation and current abilities of a person, the greater the strength of commitment to implementation.

Hypothesis 2b: The greater the congruence between abilities required by an innovation and current abilities of a person, the greater the intensity of implementation behavior.

Culture Fit

Individuals attitude and behavior are influenced by their social context through various social influence mechanisms, including socialization and social information processing(Salancik & Pfeffer, 1978). In order to incorporate this critical contextual influence, we examine the congruence between innovation values and organizational values(organizational culture). Organizational culture refers to a system of shared values(that define what is important) and norms that define appropriate attitudes and behaviors for organizational members(how to feel and behave) (OReilly & Chatman, 1996, p. 160). This definition implies that organizational culture may influence organizational members appraisal of a particular innovation(Reger et al., 1994).

Since organizational culture prescribes appropriate ways of feeling, thinking, and doing for organizational members(OReilly & Chatman, 1996), the congruence between innovation values and organizational culture(culture fit) may be a critical factor in employee responses to an innovation. In their organizational-level theorizing of innovation implementation, Klein and Sorra(1996) defined innovation-values fit as the extent to which targeted users perceive that use of the innovation will foster(or, conversely, inhibit) the fulfillment of their [organizational] values (p. 1063) and illustrated that a poor fit between an innovation and organizational values leads to poor implementation. For instance, an innovation such as team-based pay may pose a threat to an existing shared belief in the value of individual achievement(Schein, 1992). High culture fit may attach legitimacy and desirability to a particular innovation, providing a ground for employees positive appraisal of the innovation. Unlike Klein and Sorras propositions, however, our hypotheses focus on the individual-level, but not organizational-level relationships.

Hypothesis 3a: The greater the congruence between innovation values and organizational culture, the greater the strength of commitment to implementation.

Hypothesis 3b: The greater the congruence between innovation values and organizational culture, the greater the intensity of implementation behavior.

METHOD

The person-environment fit literature has identified two approaches to operationalizing the fit construct(Kristof, 1996). First, the *actual fit* approach involves a direct comparison of two separate measures, each representing comparable dimensions of person and environment(e.g., innovation values vs. personal values). Second, the *perceived fit* approach relies on individuals judgment of congruence between their personal attributes and environmental characteristics. For example, the degree of perceived fit between innovation values and personal values can be assessed by a question such as, Do you think the values promoted by this innovation reflect your own personal values (Cable & Judge, 1997). Both actual fit and perceived fit carry their own advantages and pitfalls in operationalizing the fit constructs(for a review, see Kristof, 1996). In this study, we utilized both approaches because person-innovation fit is a new construct and thus it is important to examine how actual fit and perceived fit differentially relate to the outcome variables.

Research Settings

We collected data from two Korean electronics companies that have successfully developed, manufactured, and marketed their products worldwide. We identified one target innovation per organization based on three criteria: (a) the innovation had been introduced/initiated within the twelve months prior to this field study; (b) the innovation had introduced substantial changes in employees behaviors and/or beliefs; and (c) implementing the innovation was regarded as a current and important management agenda within the organization. Based on these criteria, Six Sigma (a statistical approach to quality management) and Cyber Culture (an initiative pursuing a paperless office) were selected as the target innovations. To understand the nature of the target innovation and each implementation context, we conducted five interviews in each organization

involving employees who were target users and innovation experts who were knowledgeable about the target innovation.

The first electronics firm(Sigma company), a manufacturer of optical storage devices, launched Six Sigma about six months prior to this study. Six Sigma is an innovation that consists of a set of interventions and statistical tools designed to increase the quality of products. A process with Six Sigma capability indicates that the process variation is reduced to the extent that no more than 3.4 parts per million fall outside of acceptable qualitythat is, almost defect-free performance. More broadly, Six Sigma also refers to a philosophy, goals and/or methodologies that can be utilized to achieve extremely high-quality outputs.

The second firm(Cyber company), a manufacturer of various household electronic goods, initiated a reengineering project pursuing Cyber Culture within the six months prior to our study. The image of successful implementation of Cyber Culture was a paperless office that could be achieved by information technologies and new work procedures shared among white-collar workers. For example, employees were prompted to replace formal documents with brief e-mails or phone calls and were encouraged to maximize their use of the company intranet and electronic document system for work-related transactions instead of holding numerous face-to-face meetings.

Survey Instrument

To ensure the compatibility of data from the two organizations, we assessed the same set of constructs and in most cases used the same items. Taking the differences of the two target innovations into account, however, different sets of items were developed to measure actual ability fit and implementation behavior in the two organizations. These scales were designed to assess the same constructs for different innovations. Six-point Likert-type scales were used as response formats across the scales discussed below.

Measuring actual value fit and actual culture fit. Assessing actual value fit and actual culture fit involved comparing innovation values with personal values and organizational culture, respectively. To make this comparison valid, we created a commensurate measure of these three sets of values by using a set of value statements that is meaningful to all three referents: innovation, individual, and organization(Edwards, 1996). To this end, we adopted the six values identified by OReilly(1989) that promote innovation implementation in

organizations. Specifically, we developed one item for each of the six values: (a) being flexible enough to take risks and introduce changes(risk taking), (b) developing and experimenting with new ways of problem solving(change orientation), (c) sharing all information with colleagues(openness in communication), (d) having a common sense of direction with coworkers (sharing common goals), (e) having ownership for my work and being responsible for results(autonomy), and (f) being oriented to implementing changes(belief in action). Participants were instructed to rate these six value statements with regard to (a) their own personal work values, (b) the current organizational culture, and (c) the orientation of the target innovation. Each value statement was followed by a scale, ranging from not important at all to extremely important. Identical scales designed to measure the three sets of values were used in the two research sites and in both cases they exhibited high reliabilities (alphas) ranging between .80 and .92.

Measuring actual ability fit. Assessment of actual ability fit involved a comparison of two measures: required abilities and current abilities. Again, we sought a measure that was commensurate and compatible(Edwards, 1996; Kristof, 1996). Due to the different ability requirements of the two target innovations, we developed different lists of abilities for the two innovations. Through interviews with the innovation experts, we identified eight critical abilities for implementing Six Sigma(e.g., ability to quantify the question in hand, capacity to collect data, and capacity to apply statistical techniques). For Cyber Culture, four areas of ability emerged from interviews, including capacity to use the intranet and the electronic document system as well as expertise in ones task domain. Participants rated each ability twice, once for the extent to which each ability was required to implement the innovation and another for the extent to which they currently possessed each ability. Both required-abilities and current-abilities scales showed acceptable internal consistencies ranging from .78 to .90 in the two organizations.

Perceived value fit. In addition to the assessment of actual fit using two separate measures, we measured each fit construct by asking participants about their subjective judgments regarding fit(perceived fit). To this end, we adapted Karahanna et al.(1999) measure of compatibility between an innovation and a persons job. To assess perceived value fit, we developed a two-item measure(= .81) that included Six Sigma(Cyber Culture) is congruent with the work style that I prefer and Through Six Sigma(Cyber Culture), I can do what I

believe important. Each item was followed by a six-point Likert-type scale(1 = *not at all true*, 6 = *very true*).

Perceived culture fit. We assessed perceived culture fit using a two-item measure(= .80), including Six Sigma(Cyber Culture) matches with the behaviors and mindsets emphasized in our company and Six Sigma(Cyber Culture) supports the culture of our organization.

Perceived ability fit. Perceived ability fit was also measured by a two-item scale(= .72) that included I have enough skills and knowledge to implement Six Sigma(Cyber Culture) and Given my task ability, I dont think its difficult to implement Six Sigma(Cyber Culture) in my task.

Commitment to implementation. Participants commitment to implementation was measured by a three-item scale(= .83) including the following items: I believe that Six Sigma(Cyber Culture) leads to positive changes in my job, I believe that Six Sigma(Cyber Culture) improves my performance at work, and I want to implement Six Sigma(Cyber Culture) in my task.

Implementation behavior. Through interviews with innovation experts, potential forms of implementation behavior were identified and then transformed into survey items that measure the extent to which participants implement the target innovation in their work. For Six Sigma, we developed a six-item scale(= .95) including items such as I perform my daily tasks using Six-Sigma tools, and I have changed my work procedures according to Six Sigma. For Cyber Culture, a seven-item scale(= .83) measured the intensity of six appropriate behaviors(e.g., I heavily use the electronic document system at work, I use the intranet for task-related communication) as well as the overall behavioral pattern(Overall, I perform behaviors to enhance Cyber Culture in my company).

RESULTS

The final sample included a total of 369 employees working in the two organizations. Of the 203 Sigma employees who completed the survey(response rate = 63 %), 191 participants provided usable data. The Sigma sample included 91 % males and 30 % managers with a mean age of 34 years(*SD* = 5.45) and an average company tenure of 8 years(*SD* = 4.99). Of the initial sample of 183 Cyber employees(response rate = 61 %), 178 participants offered usable data. The Cyber sample included 88 % males and 38 % managers with an average age of 33 years(*SD* = 4.80) and a mean tenure of 8 years(*SD* = 4.70). Overall,

the demographic characteristics of the two samples were quite similar. The correlational patterns observed in the two samples were also compatible. To obtain a more stable and generalizable pattern among variables, we combined the data from the two organizations. Table 1 presents means and standard deviations of study variables and correlations among them for the combined data set.

TABLE 1

Means, Standard Deviations, and Correlations

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1. Innovation Values	4.83	.82	--									
2. Personal Values	4.46	.77	.30	--								
3. Organizational Culture	3.92	.89	.34	.38	--							
4. Required Abilities	4.56	.78	.33	.45	.20	--						
5. Current Abilities	4.13	.72	.30	.41	.27	.32	--					
6. Value Ft	4.15	1.02	.36	.17	.33	.23	.33	--				
7. Culture Fit	3.97	1.00	.39	.26	.51	.22	.22	.60	--			
8. Ability Fit	3.86	.98	.33	.15	.22	.17	.56	.43	.25	--		
9. Commitment to Implementation	4.21	1.00	.45	.24	.39	.25	.35	.73	.57	.52	--	
10. Implementation Behavior	3.74	.97	.31	.15	.33	.16	.55	.47	.29	.66	.57	--

$r > .13, p < .01$; $r > .18, p < .001$

In this study, both the predictors and criterion variables were based on self-report data from the same source, which raises a concern regarding common method variance. To examine whether common method variance was a substantial threat to the present data, Harmans one-factor test was performed(Podsakoff & Organ, 1986). In the case of Sigma data, the unrotated initial factor solution from a principal component analysis showed that eight factors were needed to explain the variance of the 49 items comprising the ten scales, and that the first factor explained only 15% of the total variance. The same procedure was applied to the Cyber sample. Nine factors emerged out of the 42 items for the ten scales, and the first factor accounted for only 10% of the total variance. The results indicate that there was no general factor that

accounted for the majority of the covariance in the predictors and criterion variables. Nevertheless, it should be noted that the present data are not free of concerns regarding self-report data such as social desirability, consistency motif of respondents, and resulting boosted correlations among variables(Podsakoff & Organ, 1986).

The two approaches to operationalizing fit adopted in this study require distinct analytic strategies that exploit the unique nature of the two data sets. For the actual fit data, we used the polynomial regression analysis suggested by Edwards(1996). To analyze the perceived fit data, we conducted structural equation modeling analyses.

Polynomial Regression Analyses of Actual Fit Data

Adopting the polynomial regression approach to analyzing fit data(Edwards, 1996), we tested linear and curvilinear effects of two measures of actual fit(e.g., innovation values and personal values for actual value fit). In these analyses, we centered predictors by subtracting 3.5(the midpoint of six-point scale) from the scale means in order to reduce multicollinearity among them. The data may indicate the presence of the fit effect if the two comprising measures of actual fit positively influence the outcome with a similar effect size in the same direction(monotonic fit model, Edwards, 1996). We then visually examined their relationships with regard to the outcome by plotting the data points on a three-dimensional response surface. This method effectively separates distinct contributions from each of the two measures of actual fit that may differentially relate to the outcome.

Actual value fit. To examine the effect of actual value fit, personal values and innovation values were entered into the equations predicting commitment to implementation and implementation behavior(see the variables in the first row in Table 2). These two values explained a greater amount of variance of commitment to implementation($R2 = .22$) than that of implementation behavior($R2 = .12$). Innovation values exerted a significant linear effect on commitment to implementation. The positive linear effect of personal values on commitment to implementation was significantly smaller than that of innovation values($F (1, 366) = 13.3$, $p < .001$). Interestingly, personal values had a significant curvilinear effect on implementation behavior. The response surfaces of the actual value fit measures visually summarize these relationships(see plots A and B in Figure 1). Both outcomes increased more rapidly along with the increment of innovation values than that of personal values. Reflecting the

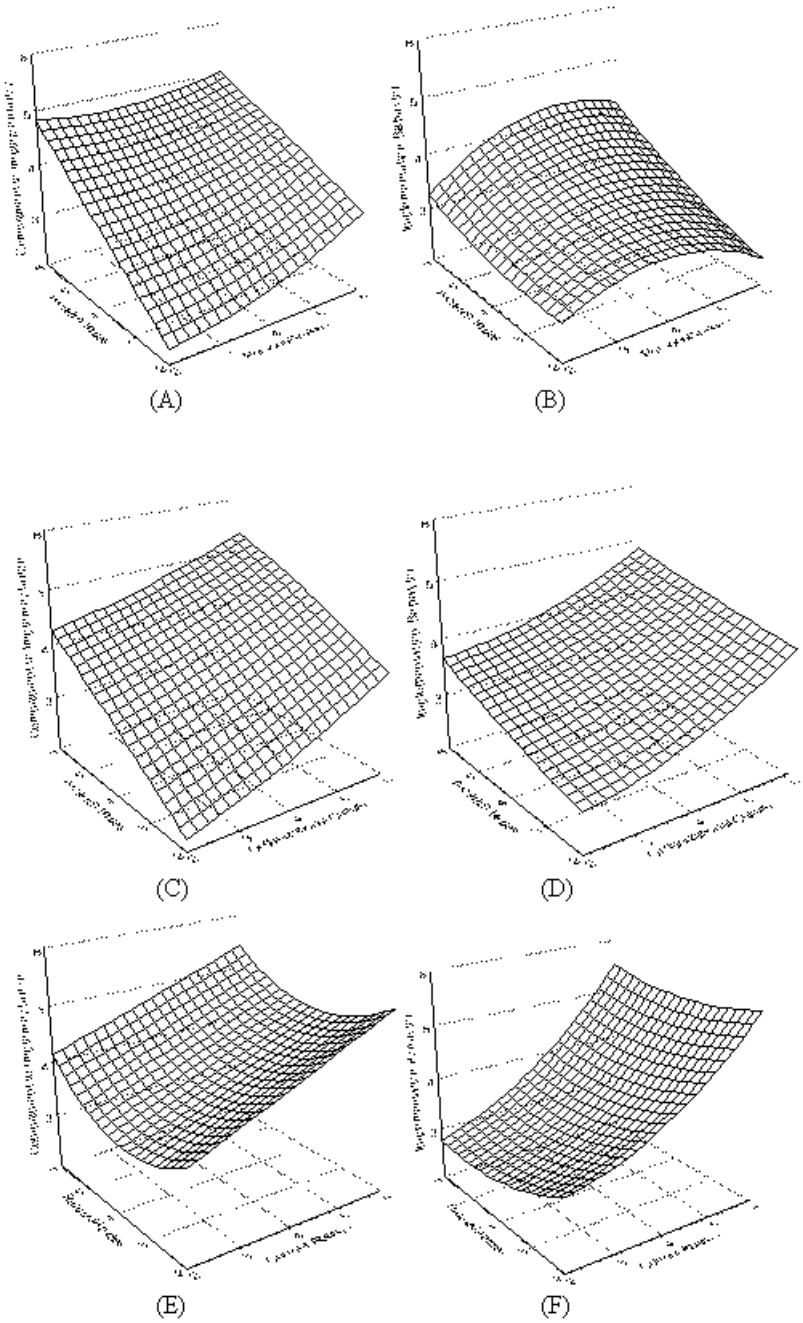
curvilinear effect, implementation behavior was greatest when the level of personal values was moderate or moderately high, rather than being either very high or low. Overall, the results suggest a strong linear effect of innovation values on the outcomes, instead of positive attitudinal and behavioral responses attached to a congruence between personal values and innovation values. Thus, H1a and H1b were not confirmed by the actual-fit data.

TABLE 2

Polynomial Regressions

Dependent Variable	Commitment to Implementation		Implementation Behavior	
Model	Linear	Curvilinear	Linear	Curvilinear
PV (Personal Values)	.15*	.27	.08	.34*
IV (Innovation Values)	.51***	.52***	.34**	.17
PV^2		.01		-.16*
PV * IV		-.01		.00
IV^2		.03		.09
ΔR^2	.22***	.00	.10***	.02*
OC (Organizational Culture)	.30***	.36**	.27***	.45***
IV (Innovation Values)	.44***	.34**	.26***	-.04
OC^2		.03		.06
OC * IV		-.05		-.14
IV^2		.05		.14*
ΔR^2	.27***	.00	.15***	.02*
RA (Required Abilities)	.20**	.00	-.02	-.13
CA (Current Abilities)	.42***	.51***	.74***	.66***
RA^2		.15*		.07
RA * CA		-.07		-.02
CA^2		-.03		.08
ΔR^2	.14***	.02	.30***	.01

FIGURE 1



Actual culture fit. The second set of variables in Table 2 tested the effect of actual culture fit on commitment to implementation and implementation behavior. Similar to actual value fit, two measures of actual culture fit explained a greater amount of variance of commitment to implementation(R2 = .27) when

compared to variance of implementation behavior(R2 = .17). Two actual culture fit measures significantly predicted both outcomes. Furthermore, in their linear relationships, the effect sizes(regression coefficients) of the two measures were not statistically different for commitment to implementation(F (1, 366) = 2.5, p > .10) and for implementation behavior(F (1, 366) = .01, p > .50). This pattern is consistent with typical expectations advanced in many fit studies(Edwards, 1996; Livingstone, Nelson, & Barr, 1997). The corresponding response surfaces plots C and D in Figures 2) illustrate compatible positive effects of organizational culture and innovation values on the two outcomes. The results, therefore, supported H3a and H3b.

Actual ability fit. The last row in Table 2 presents the results of polynomial regressions using two measures of actual ability fit. Unlike actual value fit and culture fit, two measures of actual ability fit explained a greater variance of implementation behavior(R2 = .31) than commitment to implementation(R2 = .16). For both outcomes, current abilities were the dominant predictor. In particular, implementation behavior was predicted by current abilities without any effect of required activities. Three-dimensional mapping of the data plots E and F in Figures 2) shows a strong linear relationship between current abilities and the two outcomes. Overall, current abilities had dominant effects on the attitudinal and behavioral outcomes of innovation implementation that were much greater than those of required abilities(H2a & H2b, not supported).

Structural Equation Modeling Analysis of Perceived Fit Data

For perceived fit data, the hypotheses were collectively tested by a confirmatory structural equation modeling(SEM) analysis using the EQS program (Bentler, 1995). The SEM procedure is suitable for this study because itestimates relative impacts of multiple predictors on multiple outcomes, controlling for measurement errors(Bollen, 1989).

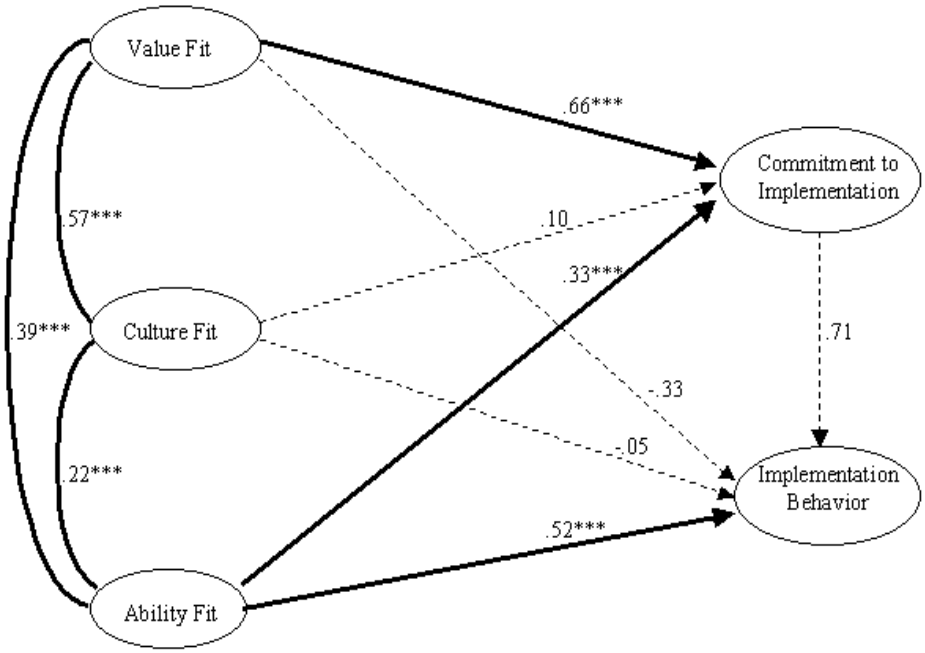
Measurement model. Because of the moderate sample size, we limited the number of indicators for each latent variable to two. Each of the three perceived fit scales had two items and thus each item was used as an indicator. Since the two outcome variables(commitment and implementation behavior) included more than two items, we conducted factor analyses of scale items using principal component analysis, specifying a two-factor solution(without this requirement, all measures produced a single factor) to obtain two subscales, each representing distinct within-scale variance. In addition, the measurement model included a company dummy code as a latent factor to control its effects on relationships

among variables. To estimate the measurement model with the latent factors as specified above, we allowed covariances between each latent variable and every other latent variable in the model. The statistical test of this measurement model is equivalent to a confirmatory factor analysis of all study variables. This measurement model fitted to the data well(2 (n = 367, df = 20) = 45.8, p < .001; CFI = .93, GFI = .91; RMSEA = .047), and thus it was used in the testing of the structural model presented below.

Structural model. Using the measurement model tested above, we created a structural model that incorporated all hypothesized relationships among variables. In addition, although it was not explicitly hypothesized, we included a path from commitment to implementation to implementation behavior. This attitude-behavior link has often been assumed, although the empirical support has been equivocal(Terry, Hogg, & White, 2000). We also allowed covariance among the three fit constructs. This structural model fit the data quite well(2 (n = 367, df = 29) = 55.23, p > .001; NFI = .97; CFI = .99; AGFI = .94; RMR = .025; RMSEA = .050). The structural diagram of this final model is displayed in Figure 2. The structural model showed that commitment to implementation was significantly predicted by perceived value fit and ability fit(H1a and H3a, confirmed). On the other hand, perceived ability fit was the only significant predictor of implementation behavior(H3b, confirmed).

FIGURE 2

Structural Model[a, b]



[a] χ^2 = 55.23 (N = 369, *df* = 29, *p* > .001); NFI = .97; NNFI = .98; CFI = .99; AGFI = .94; RMR = .025
[b] Solid lines indicate more significant results.
*** *p* < .001

DISCUSSION

This study proposed and tested a set of person-innovation fit constructs that predict employees attitudinal and behavioral responses to innovations. Examining comparable aspects of person and innovation is critical for understanding micro-level processes of innovation implementation because a persons attitude toward and behavior involving a target(e.g., other people, the organization, tasks, innovations) represent the results of implicit cognitive comparisons between oneself and the target(Edwards, 1996). Nevertheless, the innovation implementation literature has investigated personal characteristics and innovation features separately, testing their independent effects on implementation outcomes(Compeau et al., 1999; Karahanna et al., 1999). This study revealed that the extent of person-innovation fit influences individual-level outcomes of innovation implementation. Furthermore, as shown in our actual fit data, two measures of actual fit played distinct roles with respect to the attitudinal and

behavioral responses to innovations. Below we discuss implications of this study and offer directions for future research.

The present results suggest a possibility that different types of fit relate to different types of individual outcomes. Previous studies have examined the impact of supplies-values fit and demands-abilities fit on psychological outcomes, such as job satisfaction, organizational or job commitment, stress or well-being, and intention to leave(Edwards, 1996; Livingstone et al., 1997). A few studies have examined the relationship between supplies-values fit and behavioral outcomes such as turnover or organizational citizenship behavior(OReilly & Chatman, 1996). The existing literature, however, is silent about how a persons behavior is influenced by demands-abilities fit, a construct that appears to have direct implications for behavior. Kristof(1996: 31) speculated on the potentially different impacts of the two versions of fit on psychological and behavioral outcomes in a way that is quite consistent with our present findings:

> Supplementary(supplies-values) fit on values and goals may be predicted to have a strong effect on affective outcomes because they both involve attitudes, but a lesser effect on individual performance because they are distally removed from daily work behaviors. The opposite effect could be proposed for complementary (demands-abilities) fit on KSAs(i.e., knowledge, skills, and abilities), such that this type of fit would strongly influence daily on-the-job performance.

Our results indicated that value fit and culture fit were more strongly associated with psychological commitment to implementation than with actual performance of implementation behavior. The reverse pattern was observed for ability fit. For example, two measures of actual value fit and actual culture fit explained much greater variance of commitment to implementation than that of implementation behavior(see Table 2). In contrast, actual ability fit measures explained implementation behavior better than commitment to implementation compare R2s of .31 and .16). Perceived fit indices showed the same pattern. Value fit predicted commitment to implementation, but not implementation behavior. Although ability fit predicted both outcomes, it was more strongly associated with implementation behavior than commitment to implementation. The overall pattern implies the possibility that the two types of fit are related to their domain-relevant outcomes(supplies-values fit to affective/psychological outcomes, demands-abilities fit to behavioral/performance outcomes), rather than competing to explain more variance of the same outcomes as has often been

assumed.

Another interesting finding involves the way two measures of the three actual fit constructs are related to the outcomes. The person-environment fit literature showed diverse relationships between personal characteristics and related environmental factors in predicting personal outcomes. The typical expectation is that a high degree of P-E fit(e.g., fit between preferred workload vs. actual workload) will lead to favorable individual outcomes(e.g., high job satisfaction, low job strain). In previous studies using affective outcomes in the workplace such as satisfaction and tension, both high-high fit and low-low fit were related to desired outcomes. Implications of misfit, however, depend on the content of personal and environmental variables examined and the outcomes in question(Edwrads, 1996; Kristof, 1996). For example, negative effects of some forms of misfit(high workload preference matched with low actual workload, high personal skills matched with low-skill tasks) may be quite mild or nonexistent. Further, in some cases, a misfit situation(moderate desire for monetary incentive matched with extremely generous pay) can actually induce greater levels of positive outcomes than any fit conditions.

Our analysis of actual fit data suggests that two measures representing supplies-values fit(value fit and culture fit) operate in an additive manner in predicting the present outcomes. This pattern is partly due to the fact that both measures of these P-I fit constructs are beneficial to the outcomes, rather than being relatively neutral(e.g., the effects of preference for routineness and actual routineness on job satisfaction). Here, the case of low-low fit(low perceived innovativeness of the target innovation and low innovative personal values) reflects a complete dearth of driving forces for implementation in either the person or the innovation, rather than representing a harmonious fit situation. Only high-high fit, therefore, can be regarded as the fit condition in such cases. Additional three-dimensional plots of value fit and culture fit showed that employees reported the highest perceived fit in the high-high actual fit condition, and the lowest perceived fit in the low-low actual fit condition.

In the case of demands-abilities fit, abilities(current abilities) played a dominant role in predicting the present outcomes. One possible reason for this pattern is that participants would normally not have excessive current abilities in comparison with required abilities because innovations by their nature require new skills(e.g., new intranet system, statistical techniques for quality control) that employees may not yet possess. Most participants of this study might have

found that they needed to learn new skills to implement the target innovations (compare the means of required abilities and current abilities, 4.56 vs. 4.13, t = 2.7, p < .01). In this type of high demands-low abilities misfit situation, the greater the current abilities, the more likely the employees are to feel positive about the innovation and actually use it.

Another potential reason for the dominant role of current abilities, particularly with respect to implementation behavior, may involve the role of organizational context and employees public behavior. Being stressed or feeling tension at work is a private, psychological experience that may not be subject to much organizational influence. Implementation behavior, on the other hand, represents a public behavior for which the organization may have established clear expectations. As members of an organization in which implementing a particular innovation is expected and rewarded, employees may implement the innovation if they possess abilities needed for the innovation, regardless of their personal evaluation of the innovation(see the insignificant link between commitment to implementation and implementation behavior after controlling for the effect of perceived ability fit on implementation behavior). Overall, our findings suggest that the underlying dynamics linking the two measures of actual fit may vary depending on their content domains(values vs. abilities), their relative levels, their implications for the outcomes in question(positive, neutral, negative), and potential organizational influences on their relationship with respect to the outcomes. This topical area is in need of further conceptual and empirical effort.

This study has several limitations. Because the current data were collected in two Korean electronics companies, the present findings may have limited generalizability to different cultural contexts such as U.S. firms or less technology intensive industrial settings. For example, in the present sample, the role of personal values with regard to employees responses to innovations was relatively weak in comparison with organizational culture. The role of organizational culture could be exaggerated in our sample because of the unique corporate culture of Korean firms, which often demands high compliance and loyalty to the organization(Kim, 1992). In a more individualistic culture such as that of the U.S., personal values may comprise a more important predictor determining employees attitude and behavior regarding innovations. In addition, industry-wise differences with respect to frequency, intensity, and importance of innovations might lead to different degrees of employee openness to and actual

use of innovations. There is a clear need for future comparative studies addressing these issues that would broaden our understanding of how microprocesses of innovation implementation are shaped by global contextual factors such as societal culture and industry characteristics.

In addition, the present findings are based on cross-sectional self-report data collected from the same source. Therefore, the causal directions among variables cannot be determined from the data. For example, perceived ability fit could be the consequence of successful performance of implementation behavior, rather than the cause(Lindsley, Brass, & Thomas, 1995). These and other variables in this study are likely to be linked by dynamic and complex causality, influencing each other over time through multiple feedback loops. Longitudinal studies tracking and following the introduction and implementation of innovations over time are needed.

Finally, this study included only one contextual factor, organizational culture. Many other organizational factors such as structure, policies, and various systems provide either positive or negative context for implementation. These organizational factors may affect the relationship between person-innovation fit constructs and individual-level outcomes of innovation implementation. It has been shown that individual trait-behavior relationship becomes stronger under the situation that is consistent with the given trait. For example, Oldham and Cummings(1996) detected a four-way interaction among individual and contextual variables, in which creative performance was highest when employees with highly creative personalities work on complex, challenging tasks under supportive and noncontrolling supervision. Similarly, the fit between personal values and innovation values may be more likely to engender a positive attitude toward and actual use of the innovation when the organization offers sufficient technical and material support as well as tangible and intangible incentives for innovation use(Klein & Sorra, 1996).

Moreover, the degree of formality of the implementation effort and whether it is based on a top-down or bottom-up initiative may modify the relationship between P-I fit constructs and individual-level implementation outcomes. In addition to validating the present findings in varied settings, exploration of this contextual shaping of individual-level processes may be a logical next step for expanding person-innovation fit research. Of theoretical significance is the identification of the most plausible function(e.g., fit, additive or multiplicative relationship, moderation, mediation) that links the

individual-level processes and the context embedding them. These theoretical and empirical efforts would enrich our understanding of the whole process of innovation implementation and organizational change by offering microprocess-based accounts that complement the existing literature, which is largely devoted to organizational-level analyses.

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