

The influence of situation strength on adoption of healthcare information technology

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SAMENVATTING

Met de toenemende focus op zorginformatietechnologie (ZIT) om organisatorische processen te optimaliseren en medische fouten te verminderen staat de zorg voor de uitdaging om innovaties succesvol in de organisatie te laten landen. Volgens de sterke situatie hypothese leiden duidelijke en eenduidige situationele signalen tot uniform gedrag van individuen, ongeacht hun persoonlijkheid. Als dit het geval is, kan adoptie van ZIT effectiever en efficiënter gerealiseerd worden door duidelijke en eenduidige signalen af te geven. In dit onderzoek wordt verondersteld dat deze duidelijke en eenduidige signalen ertoe leiden dat individuen de intentie hebben om ZIT te gebruiken, ongeacht hun persoonlijkheid. 83 Nederlandse verpleegkundigen werkzaam in verzorgingstehuizen en verpleegtehuizen vulden een doel oriëntatie vragenlijst in tezamen met een discreet keuze experiment, volgens een “within-subjects design”. De resultaten steunen de hypothese niet: duidelijke en eenduidige signalen leiden ertoe dat individuen de intentie hebben om ZIT te gebruiken, maar persoonlijkheid beïnvloedt deze relatie wel.

ABSTRACT

With the increasing focus on healthcare information technology (HIT) to optimize organizational processes and reduce medical errors, one of the challenges in healthcare is to successfully diffuse IT innovations through the entire organization. Following the strong situation hypothesis, clear and non-ambiguous situational signals lead to uniform behavior from individuals regardless of their personality. When this is the case, adoption of HIT can be realized more effective and more efficient via clear and non-ambiguous signals. In this study it is hypothesized that these clear and non-ambiguous situational signals lead individuals to show the intention to use HIT, regardless of their personality. 83 Dutch nurse practitioners in homes of the elderly and handicapped completed a goal orientation questionnaire and a discrete choice experiment, using a within-subjects design. The results do not support the hypothesis: clear and non-ambiguous signals do lead individuals to show the intention to use HIT, and personality does influence this relationship.

Key words: strong situation hypothesis, goal orientation, healthcare information technology, user adoption , Person x Situation

INTRODUCTION

Adoption of health information technology (HIT) is difficult due to its complex nature, consisting of organizational, technical, personal and social factors (Cresswell and Sheikh, 2012; Chandra and Skinner, 2012; Callaway and Ghosal, 2012; Ploem et al., 2011; Veer and Francke, 2009; Chau and Hu, 2001). The challenge to increase adoption of HIT among healthcare professionals is an international challenge. Research concerning this topic is conducted among others in the USA (Holden and Karsh, 2010), Canada (Godin et al., 1999), South Korea (Ryu, Ho and Han, 2003) and Hong Kong (Chau and Hu, 2001). Such research focuses on relevant factors and their relative influence that contribute to the intention to use the innovation, e.g. attitude, social norm of colleagues and facilitating conditions of an organization (Ketikidis, Dimitrovski, Lazuras and Bath, 2012; Orruño, Gagnon, Asua and Abdeljelil, 2011; Holden and Karsh, 2010).

Little research has focused on the effect of adoption of HIT when all such factors signal that adoption of HIT is the desired behavior to be performed. Mischel (1977) stated that when situational factors are clear and unambiguous, all individuals regardless of personal characteristics have the intention to show the desired behavior, or perform the desired behavior. This is called the *strong situation hypothesis*. When this hypothesis holds, a single strategy to encourage adoption of HIT can be developed regardless of cultural and personal differences. However, evidence that supports the strong situation hypothesis is thin and lacking methodological soundness (Cooper and Withey, 2009).

Contemporary research on the adoption of HIT using psychological behavioral models mainly focus on situational cues that influence attitude towards adopting behavior that includes the use of HIT. Behavioral models concerning adoption of HIT are TRA/TPB (Godin et al., 2008; Cabana et al., 1999) and TAM (Sun, Wang, Guo and Peng, 2013; Ketikidis et al. 2012; Holden and Karsh, 2010; Bagozzi, 2007). However, TRA and TPB are not focused on adoption of IT and therefore less suitable. Furthermore, review studies on the use of the TAM in healthcare settings point out that results are inconclusive about the significance of variables (Ketikidis et al. 2012; Holden and Karsh, 2010). Reasons are sought in culture or personality characteristics like age (Chung et al., 2010), trust and the extent to which information is shared (Terrizzi et al, 2012). This research does not study the relevance and significance of a single variable, but focuses on the significance of a set of variables, which signal that adoption of HIT is desired. It is expected that healthcare professionals regardless of their personal characteristics will show the intention to use HIT when all situational cues

encourage doing so. The research question of this study is as follows: Situational strength positively influences the intention to use, regardless of personality.

THEORETICAL FRAMEWORK AND HYPOTHESIS

The following section provides the theoretical framework of this study. First, the strong situation hypothesis is discussed in more detail. Subsequently, the choice of situational factors in the research model is motivated. Next, it is discussed that goal orientation is a relevant personality measure when measuring the intention to use HIT. Finally, the hypothesis of this study is presented.

The strong situation hypothesis

Walter Mischel (1977) stated that situations that signal non-ambiguous, clear, cues will lead individuals to perform uniform behavior independent of their personality. Mischel (1977) claims that these “strong situations” “(1) *lead everyone to construe the particular events the same way*, (2) *induce uniform expectancies regarding the most appropriate response pattern*, (3) *provide adequate incentives for the performance of that response pattern* and (4) *require skills that everyone has to the same extent*” (Mischel, 1977, p.34, parentheses added). For weak situations the same characteristics with opposite directions apply. Various research on the strong situation hypothesis lead Mischel and Shoda to state that behavior can be influenced by creating an environment that sends out non-ambiguous cues, which lead to the paradigm of Person (P) x Situation (S) interactionism (Cervone and Shoda, 1999; Mischel and Shoda, 1995, 1998; Shoda, Mischel and Wright 1993, 1994; Vansteelandt, 1999, Vansteelandt and Van Mechelen, 1998). P x S interactionism implies to be a dynamic mechanism that lead individuals to inhibit stable *if... then...* patterns of situation-behavior relationships. In relation to this study, it implies that *if* a strong situation occurs, *then* all individuals will perform the same action. While *if* a weak situation occurs, *then* individuals will perform a random action.

Following P x S interaction models (e.g. Lewin, 1935; Murray, 1938; Cervone and Shoda, 1999; Mischel and Shoda, 1995, 1998; Shoda, Mischel and Wright 1993a; 1994; Vansteelandt, 1999, Vansteelandt and Van Mechelen, 1998; Mendoza-Denton et al. 2001) situational cues elicit different personal responses. Such interaction patterns can in the most extreme cases lead to a nullified influence of personality characteristics; corresponding to the *strong situation hypothesis* (SSH) (Mischel, 1977; Mischel, Ebessen and Zeis, 1973; Shoda,

Mischel and Wright 1993b). However, there is ample empirical evidence for this hypothesis (Cooper and Withey, 2009).

This study explores the extent to which situation strength influences the intention to use HIT *regardless* of personal characteristics. Following the SSH individuals perform the same behavior, regardless of personal characteristics. I.e. interaction patterns between personal characteristics and situational strength are stable for a personal characteristic. For example, an interaction pattern for age and situational strength will show that when situations are strong, the intention to use HIT does not vary depending on the age of the individual.

Situational factors

To test the SSH situational factors that affect the intention to use HIT must be identified and included in the research model. The following existing behavioral models that are used to study intention to use technology, TAM (Davis, 1989; Venkatesh and Davis, 2000), UTAUT (Venkatesh et al., 2003) and DOI (Rogers, 1985) were analyzed on the inclusion of situational cues. All models include the *social norm* of significant others and this factor was included in the research model of this study. UTAUT includes facilitating conditions, consisting of *organizational history* as the extent to which an organization has successfully introduced innovation in the past and *technical infrastructure* as the extent to which an innovation can technically be supported by the organization. These facilitating conditions are included in other studies researching the intention to use HIT (e.g. Orruño, Gagnon, Asua and Abdeljelil, 2011). From the DOI the factor *trialability* is included as the extent to which an individual is allowed to experiment with the innovation. To limit the complexity of the model and the conduction of the research (limiting the minimal number of respondents) other situational cues like *communication channels* and *voluntariness of the use of the innovation* were considered, but not included.

Goal orientation

Finding a relevant personality characteristic to test the strong situation hypothesis is a challenge and varies depending on the goal of the study (Cooper and Withey, 2009). The main focus of this study is determining combinations of factors that influence the motivation to adopt HIT. Elliot (2006) states that because goals are the last component in the motivation process, they hold a unique position in the process of self-regulation. Goal orientation is the concept that describes the variability to the extent to which individuals set their goals (Vandewalle, 1997).

The definition of a goal following Elliot and Fryer (2008) consists of five aspects: cognitive representation, future, object, committed to, and approach or avoid. The focus of this study is the last aspect: approach or avoid.

Approach vs. avoidance: One dimension to explain motivation is the approach-avoidance dimension (Elliot and Covington, 2001). Approach motivation can be defined as the motivation to display behavior in order to gain rewards of a positive nature, but also to maintain current positive situations. Avoidance motivation can be defined as the motivation to display behavior in order to avert or prevent negative situations. The distinction between approach and avoidance behavior can be traced back to biological structures apparent in more organisms, e.g. fight or flight mechanism (Tooby and Cosmides, 1990), see Payne, Youngcourt and Beaubien (2007) for a comprehensive review on historical evidence, justifying the approach-avoidance dimension.

An individual can be approach as well as avoidance oriented when determining his goals, displaying reward oriented behavior and punishment avoidant behavior at the same time. Literature shows that approach goals can be pursued in order to prevent failures, approaching in order to avoid (Elliot and Church, 1997; Elliot and Reis, 2003; Elliot and Thrash, 2004, Elliot and Thrash 2012).

Performance vs. mastery: Eison (1979) and Nicholls (1975) studied the concept of goal orientation and came up with the idea that goal orientation involve the concepts of task involvement (or learning orientation) and ego involvement (or grade orientation). The former concept describes the extent to which an individual sets its goals and evaluates itself based on past performance or personal enlightenment. The latter concept describes the extent to which an individual sets its goals and evaluates itself based on external references, e.g. performance of significant others. While for long researchers believed that this dimension of goal orientation was bipolar (Dweck, 1986, 1989; Eison, 1979), Button et al. (1996) challenged this assumption by stating that individuals can be competitive divers. Meaning that individuals can use competition with others as a means to improve their own performance. Elliot and Thrash (2002, 2004) devised and tested a measure that showed that indeed the constructs, named *performance* (ego involvement) and *mastery* (task involvement), of this dimension are independent.

The two dimensions lead to four possible types of goal orientation (here the terminology of Elliot and Thrash (2004) is adopted): *Performance approach*, *performance avoidance*, *mastery approach* en *mastery avoidance*. Table 1 describes the four goal orientation types.

TABLE 1
Four types of goal orientation

	Performance	Mastery
Approach	The extent to which an individual is motivated to display behaviors that will lead to <i>positive situations</i> in order to <i>outperform others</i>	The extent to which an individual is motivated to display behaviors that will lead to <i>positive situations</i> in order to gain <i>personal growth</i>
Avoidance	The extent to which an individual is motivated to display behaviors that will avoid <i>negative situations</i> in order to <i>outperform others</i>	The extent to which an individual is motivated to display behaviors that will avoid <i>negative situations</i> in order to gain <i>personal growth</i>

Hypothesis

In this study it is expected that goal orientation as a personality trait weakens the relationship between situation strength and the intention to use HIT. Such an interaction would disprove the strong situation hypothesis. Following the strong situation hypothesis, the influence of personality is nullified when situations are strong, so no interaction effects between personality and situational strength should be significant.

Hypothesis: *Goal orientation weakens the relationship between the strength of the situation and the intention to use HIT.*

METHOD

Sample

The questionnaire has been distributed among 104 respondents in two phases. A pilot study was conducted among 19 healthcare professionals. Ten of them held a position at a home for the handicapped. The nine others were working at different healthcare institutions in different positions all related to providing care to patients or clients. All 19 participants were encouraged to provide written and verbal feedback on the questionnaire. 11 participants completed the questionnaire (58%) and provided feedback to improve the understandability and legibility of the questionnaire. The 11 respondents did not indicate they had problems with the design of the questionnaire. The design of the questionnaire remained unchanged, but changes were made to the instructions to improve understandability and legibility.

Subsequently, two institutions, a nursing home for the elderly and an institution for the handicapped were willing to participate in the study. The questionnaire has been distributed among 85 nurse practitioners over the healthcare institutions. 75 respondents returned the questionnaire. After careful review, three questionnaires have been excluded, because they were incomplete. In total 72 questionnaires have been included (85%), resulting in a total of 83 respondents that are included for this study.

Respondent's ages ranged from 17 to 59 with an average of 37.57 years. 11% of the respondents were male and 89% were female. 53% reported to have a vocational degree (in Dutch: MBO-diploma).

Procedure

No sampling was used at the nursing home of the elderly. All 45 nurse practitioners participated in the study. The sampling at the home for the handicapped was done by randomly identifying eight teams that consisted of nurse practitioners. Teams consisted of eight to ten nurse practitioners. Teams that were composed otherwise were excluded. Each team received five questionnaires and decided among the team members who would participate.

Questionnaires were distributed by an employee from within the organization who was provided information about the study design. The employee was responsible for distributing and gathering the questionnaires and was briefed with the instructions to answer simple questions from the respondents. More complex questions were passed on to the researcher. The employee was excluded from participation in the study.

All subjects were allowed to complete the questionnaire during work hours. Subjects were instructed that the questions were concerned with how they would like to be facilitated when their organization introduces an IT innovation. Subjects were given instructions on each separate part of the questionnaire. The instructions provided information about the procedure and explained information about the situational factors.

Measurements

The questionnaire that was used in study consisted of four parts; all respondents received the same questionnaire resulting in a within-subjects design. First, demographic information was asked. Next, 12 statements are given to measure the respondents score on the goal orientation scale of Elliot and Thrash (2004). Third, the respondents are given a discrete choice experiment (DCE), which is considered to be a beneficial research instrument

healthcare decision making (Lanscar and Louviere, 2008; Ryan and Farrar, 2000). The DCE has a total of 12 choices, composed following an efficient design. Each choice consists of two situations. The respondent indicates based on the nature of the situation, which situation matches his preference(s). An example of a choice can be found in Appendix A. Last, participants are asked to answer seven control questions. In this section the different parts of the questionnaire are discussed in more detail.

Demographic information: Participants were asked to fill out their sex, age, occupation and education level.

Goal orientation questionnaire: Goal orientation scales were measured on a 7-point Likert scale that ranged from “1=strongly disagree” to “7=strongly agree”. All scales consisted of three items that are translated from Elliot and Thrash (2004). For each scale an example item is given. The relevancy and factor loadings of the items were tested by Elliot and Thrash (2004). Since this study was conducted in a classroom setting, the classroom context of some items needed to be translated to a work-related context. The reliability of the four measurements are given by their internal consistency measure, measured with Cronbach’s alpha. Scores below 0.63 were taken as unacceptable. The translated questions can be found in Appendix B.

Performance approach: The performance approach measure consists of three items ($\alpha=0.73$). The measure emphasizes the comparison between the performance of a nurse practitioner with its colleagues, referring to the *performance* dimension of goal orientation. The items are phrased in such a way that showing the described behavior (perform well) will lead to positive work outcomes, referring to the *approach* dimension of goal orientation. An example of an item is “I find it important to outperform my colleagues”.

Performance avoidance: The Performance avoidance scale consists of three items ($\alpha=0.70$). The items contain the concepts of underperformance, which implies a certain externally set standard, referring to the *performance* dimension, and avoid, referring to the *avoidance* dimension. An example item for this measure is “My fear to underperform at work is often what motivates me”.

Mastery approach: Mastery approach consists of three items ($\alpha=0.54$). Reducing the scale to two items does not sufficiently increases its reliability and therefore the Mastery approach scale is not considered further in this study. Items emphasizes personal development in a work-related context, gaining knowledge and skills to do the best you. This corresponds to the definition of the *mastery* dimension. The development goals are set in order to encounter positive situations, referring to the *approach* dimension. An example item

for Mastery approach is “It is important for me to master the work activities that I do as well as I can”.

Mastery avoidance: The Mastery avoidance scale consists of three items ($\alpha=0.70$). The items contain the concept of worrying, which refers to the *avoidance* dimension of goal orientation. The items emphasize the internal referent to the self, which corresponds with the definition of the *mastery* dimension. An example of a Mastery avoidance item is “I am worried that I cannot develop myself to my full ability in this job”

Vignette factors: The vignettes in the DCE consist of four factors: (1) technical infrastructure of the organization; (2) organizational history concerning IT innovations; (3) the social norm of colleagues; and (4) the extent to experiment with the innovation. The factors are dichotomous containing either a positive value or a negative value. This restriction is made to limit the maximum possible scenarios and thereby the minimal number of respondents needed for reliable results. The design controls for the type of innovation by including three different innovations.

Situation strength: A variable *strength* is introduced, which is the sum of situational factors. Situational factors take on values of 0, when negative and 1, when positive. Strength has a minimum of zero and a maximum of four.

Interaction variables: Interaction variables were created for the multilevel logistic regression analyses. The variables are the product of the standardized strength variables and the standardized goal orientation scales. Strength and goal orientation variables were centered such that they have a mean $\approx$ 1 and SD $\approx$ 0. When computing the strength of the situation without trialability, the trialability variable is also centered in the analyses.

When situation strength consisted of the situational factors except trialability, interaction variables were created for goal orientation scales and the standardized trialability variable.

Dependent variables: This study measures the intention to use HIT. This is measured by asking the respondents to mark the preferred situation with an “X” when answering the statement “The app I would use is...”. The dependent variable is one dichotomous variable indicating whether the situation wherein the app is presented was chosen or not.

Manipulation checks: Manipulation checks were measured using a 7-point Likert scale. Questions were asked to measure the extent to which respondents had understood the statements of the goal orientation scale, the imaginary situation for the DCE and the differences between the choices. In addition, respondents were asked to which extent the DCE matched their real-life work experience.

RESULTS

Manipulation checks

The means and standard deviations are listed in Table 3 in Appendix C. All questions are scored between 3.8 and 5.4 on a 7-point Likert scale. Indicating that respondents understood what was asked of them.

Hypothesis testing

To test the hypothesis of this study multilevel logistic regression using a random effects model with standardized interactions were executed in Stata. Standardization is performed on the variables representing situation strength and the different goal orientation types. Standardization was done by centering the variables around their means. The motivation to choose for multilevel analysis is because respondents answered multiple vignettes in the DCE. This violates the assumption of independent observations and requires the correction of multilevel analysis. Two levels were defined: a level for respondents and a level for vignettes. The dependent variable *intention to use* is a dichotomous variable, requiring logistic regression.

The results of the multilevel logistic regressions can be found in Table 2. The results show a main effect of the strength of the situation on the intention to use HIT and an interaction effect between situation strength and all three goal orientation scales *Performance Approach*, *Performance Avoidance* and *Mastery Avoidance*. The main effect for the goal orientation scales on the dependent variable is not significant. The results indicate that goal orientation strengthens the relationship between situation strength and the intention to use HIT.

The hypothesis of this study is not supported by the data. The results indicate that the goal orientation as personality trait of the nurse practitioners strengthens the relationship between unambiguous situational cues and the intention to use HIT. Implying that the strength of the situation becomes stronger for nurse practitioners that score high on goal orientation than nurse practitioners that score low on goal orientation. This is opposed to the hypothesis of this study, which stated that goal orientation reduces the strength of the situation.

TABLE 2

Results for interaction effects of goal orientation and situation strength on intention to use, situation strength consists of all four situational variables

	Coefficient	Std. error	Z
Performance approach			
Strength	0,17	0,05	3,64***
Performance approach	0,00	0,05	0,05
Strength*Performance approach	0,08	0,05	1,83*
Performance avoidance			
Strength	0,17	0,05	3,67***
Performance avoidance	-0,00	0,05	-0,02
Strength*Performance avoidance	0,13	0,05	2,77**
Mastery avoidance			
Strength	0,17	0,05	3,65***
Mastery avoidance	0,00	0,05	0,07
Strength*Mastery avoidance	0,10	0,05	2,08**

Note. * = $p \leq .1$; ** = $p < .05$, *** = $p < .001$

DISCUSSION

In the following section the results of this study are summarized and interpreted in light of the theories and hypothesis underlying this study. Additionally, the implications of the results are discussed with regard to Dutch elderly homes and homes for the handicapped. Subsequently, the limitations of this study are discussed as well as alternative explanations for the results that are inherent to the theories and study design. Together this leads to suggestions of future research, which is expanded to an integral approach to study the complex domain of adoption of HIT.

Interpretations of the results

The results show that goal orientation strengthens the relationship between situational strength and the intention to use HIT. This implies that the more goal oriented the nurse practitioner, the more situation strength positively affects the intention to use HIT. I.e. goal oriented nurse practitioners are more affected by the strength of the situation than less goal oriented nurse practitioners.

The results also show that there is no main effect of the goal orientation scales on the intention to use with a coefficient of 0. The design of the study prevents to facilitate analyses of main effects between personal characteristics and the intention to use HIT. Because of the DCE respondents score as many situations with “1” (intention to use) as with “0” (no intention to use). Standardizing the goal orientation scales will result in a non-significant main effect of 0.

Theoretical implications

This study presents evidence disproving the strong situation hypothesis (Mischel, 1977). Following the strong situation hypothesis, individuals should perform uniform desired behavior based on situational cues, *regardless* of personality. Because the results show that interaction effects between personality traits and situational cues are significant, it indicates that the strong situation hypothesis is too strict. This finding supports the evidence that the strong situation hypothesis does not seem to hold (Cooper and Withey, 2009). However, it is remarkable that the interaction effect strengthens the influence of situation strength, implicating that high goal oriented individuals are affected even more by situation strength. Still, the strong situation hypothesis predicts no interaction effects at all.

The results indicate behavioral intention is a combination of personal and situational factors, corroborating the evidence of Person x Situation interactions (Mendoza-Denton et al., 2001). The influence of situational strength is strengthened by the different goal orientation scales, implying that scoring high on a goal orientation measures increases the extent to which the strength of the situation determines the intention to use HIT.

Practical implications

The results of this study imply that managers of Dutch homes of the elderly and handicapped must take personality and culture of their employees into account when introducing HIT in their organization. Adoption of HIT cannot only be stimulated through situational cues, since this study shows that personality traits interact with the relationship between unambiguous situational cues and the intention to use HIT.

However, the results do show that situational strength has a positive effect on the intention to use HIT. This implies that by ensuring that the organization has a good technical infrastructure; had successful innovations in the past; give users the possibility to experiment with the innovation and; have employees that have a positive attitude towards the innovation, the intention to use the innovation will be larger.

In addition having employees that are goal oriented can accelerate the user adoption of HIT, because such individuals are affected more by situation strength than individuals that are less goal oriented. Such information can be useful when deciding on an implementation strategy.

Limitations to this study

General limitations: This study is conducted among 83 nurse practitioners of different organizations. This is a small sample of Dutch healthcare professionals. The extent to which results can be generalized is unknown and caution is advised when generalizing this results.

Organizational research has been critical on variables that measures “intent to...”, especially when the relation with the actual variable of interest is weak (e.g. Dalton, Johnson and Daily, 1999). Evidence on the relation between intention to use and actual use is thin (Webb and Sheeran, 2006). In this study results refer to support for the introduction of an IT innovation, rather than referring to the actual use of the innovation.

Limitations to the design: In this study the relationship between personality and situation strength is measured. More insight could be gained by measuring the influence of other personal characteristics like age and educational level. Correlations between variables like age, educational levels, goal orientation and situational strength could provide richer

information about the current results of this study. Limitations to the design prevent analysis of such variables on the dependent variable “intention to use”. Correlations between personal characteristics would yield no sensible results. Analyses that substitute goal orientation for another personal characteristic would require splitting the population in subgroups with cut-off points at random values to form equal subgroups. Such analysis have little explanatory power.

In addition it would be helpful to know which interaction patterns occur between separate situational cues and the goal orientation scales. The interaction patterns could show the cause of the strengthening relation between goal orientation and situation strength, e.g. it might be caused because of the relationship between goal orientation and one specific situational factor like trialability. However, such patterns require a larger set of respondents. Alternatively, such analysis could be done adding interactions one by one, with the loss of power. Performing these stepwise analysis is put beyond the scope of this study. It answers a different research question and because of its complexity it can be seen as a study of its own.

Withey and Cooper (2009) held a critical literature review on the evidence for the strong situation hypothesis. In their conclusion they restate the conditions a study must adhere to when testing the strong situation hypothesis. First, the design must vary independently between situational strength and behavioral base rates. The design of this study does not apply such variance. Second, the relative importance of the four dimensions from Mischel (1977) should be assessed in a between-subjects design. This study did not conduct such an assessment. In contrast, this study did consider a suitable personality measure using the goal orientation measure. Goal orientation can be related to learning styles that apply to the intention to change behavior, such individuals are called goal oriented achievers (e.g. Jackson, 2009). Additionally, the risk that perceptions of the situations are filtered by personality can be accounted for by studying main effects of goal orientations types on control variables that measure the extent to which subjects understood what was expected from them. Leaving two conditions from Withey and Cooper unaccounted for and therefore the strong situations hypothesis is not tested properly.

The situation strength relies on the factors *technical infrastructure of the organization, organizational history with regard to successful innovations, attitude of colleagues towards the innovation and the extent to which an innovation can be experimented with*. Because of its ambiguous description, there possibility exists that trialability is not interpreted as situational factor. Therefore the design to test this hypothesis might lack clarity for the respondent,

resulting in inaccurate results. This calls for a careful revision of the descriptions of the factors in the vignettes.

Some subjects reported verbally, by email or by notes on the questionnaire that they had difficulties understanding the DCE. The control questions do not indicate that subjects structurally misunderstood the DCE. However, subjects might have given desirable answers to these questions. In addition, choices made at the beginning of the DCE might have suffered from a lack of understanding, because during the process of filling in the questions of the DCE the understandability of the DCE might have increased. Finally, the design measures theoretical considerations that might not be similar to the considerations respondents make when confronted with such situations in real life.

Future research

Future research should focus on replicating the results of this study with larger datasets to see if significant effects for all goal orientation measures with regard to situation strength are to be found. Additionally, more accurate variations can be applied in situation strength. This study measures situation strength by simply summing the presences of situational factors. The weight of such an situational factors is not taken into consideration. The results of this study show that trialability has a larger weight than other situational factors. Based on the strong situation hypothesis it is to be expected that only strong situations will lead high scoring subjects on goal orientation to show the desired behavior. Any concession in the situation strength will lead to unpredictable behavior. Based on the results of this study concession to situational factors with lower weights do not impact the behavioral intention.

This study focused on the interaction between goal orientation scales and situation strength. The results do not show the actual difference between low and high scoring individuals, they only show that when goal orientation *increases* the influence of situation strength becomes larger. Future research should focus on the reversed relationship hypothesizing that the influence of situation strength becomes smaller when goal orientation *decreases*.

Future research should try to replicate these findings in other domains. Goal orientation is a personality characteristic independent of the working domain. Therefore it is expected that similar results are found other domains besides healthcare.

To fully understand the motivations to adopt IT innovations, future research should focus on behavioral drivers from different academic domains. While the field of psychology

studies the behavior of individuals, business drivers like reward systems and policy drivers like policy content and participation could play an important role in the intention to use IT. Future research should incorporate these factors into one study to test the strong situation hypothesis in a broader perspective.

CONCLUSION

The purpose of this study was to test the assumption that clear and non-ambiguous situational signals alone direct individuals towards uniform behavior, regardless of their personality. The contribution of this study is that it indicates that the influence of clear and non-ambiguous cues is dependent on personality, implying the existence of Person x Situation interaction patterns. It contributes in disproving the strong situation hypothesis that states that clear and non-ambiguous situational cues lead every individual to perform uniform behavior, *regardless* of personality.

Challenges can be found in replicating the results on larger data sets. Additionally, adoption of IT is studied in other domains besides healthcare, replication of the study results in other domains would contribute to the generalization of the results and the existence of generic Person x Situation interaction patterns. Also, expanding the situation by adding cues from other domains and weigh these cues could give better insights in the interactions between situational cues and personality factors.

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APPENDIX A

Example choice of the DCE

	Situatie 1	Situatie 2
Omschrijving van de app	Een app waarmee u patiëntgegevens als een zakkaartje op uw iPhone meedraagt	Een app waarmee u patiëntgegevens als een zakkaartje op uw iPhone meedraagt
Uitproberen	Mogelijk	Niet mogelijk
De mate waarin de organisatie technisch klaar is om de app in te voeren	Voldoende	Voldoende
De mate waarin de organisatie in het verleden succesvol technische innovaties heeft ingevoerd	Onvoldoende	Onvoldoende
Mening van uw collega's	Enthousiast	Enthousiast
Beloning	Niet meer zeulen met dossiers	Niet meer zeulen met dossiers

Vragen (kruis de situatie aan die het beste bij u past):

	Situatie 1	Situatie 2
De app die het meest gemakkelijk te gebruiken voor mij als persoon is		
De app die het meest nuttig ter ondersteuning van mijn dagelijkse werkzaamheden		
De app die ik zou gebruiken is		

FIGURE 1

Example choice from the DCE

APPENDIX B

Goal orientation questionnaire per goal orientation scale

Performance approach

To measure Performance approach the following three items were translated and adjusted.

1. “I find it important to outperform my colleagues”;
2. “I find it important to perform well, in comparison with my direct colleagues”;
3. “My goal within the work that I do, is to get a better assessment than my colleagues”.

These three items emphasize the comparison between the performance of a healthcare professional with its colleagues, referring to the *performance* dimension of goal orientation. The items are phrased in such a way that showing the described behavior (perform well) will lead to positive work outcomes, referring to the *approach* dimension of goal orientation.

Performance avoidance

The three items to measure Performance avoidance were translated and adjusted as follows.

1. “My fear to underperform at work is often what motivates me”;
2. “I want to particularly avoid that I underperform at my work”;
3. “My goal at work is to avoid underperformance”.

All three items contain the concepts of underperformance, which implies a certain externally set standard, referring to the *performance* dimension, and avoid, referring to the *avoidance* dimension.

Mastery approach

To measure Mastery approach the following three items were translated and adjusted.

1. “It is important for me to master the work activities that I do as well as I can”;
2. “I want to evolve myself as well as I can”;
3. “I desire to completely master the required knowledge and skills for my work”.

These three items emphasize personal development in a work-related context, gaining knowledge and skills to do the best you. This corresponds to the definition of the *mastery* dimension. The development goals are set in order to encounter positive situations, referring to the *approach* dimension.

Mastery avoidance

The three items to measure Performance avoidance were translated and adjusted as follows.

1. “I often worry that I cannot acquire all the knowledge and skills that this job has to offer”;
2. “Sometimes I worry that I lack the knowledge and skills to do my job as I would like”;
3. “I am worried that I cannot develop myself to my full ability in this job”.

All three items contain the concept of worrying, which refers to the *avoidance* dimension of goal orientation. The items emphasize the internal referent to the self, which corresponds with the definition of the *mastery* dimension.

APPENDIX C

Statistics of the manipulation checks

TABLE 3
Descriptive statistics of the manipulation checks

	Mean	Std. Deviation
I understood what to do when answering the statements concerning goal orientation	5,36	1,828
The wordings of statements were clear	4,17	1,918
The statements were understandable, so that I could answer them easily	4,61	1,671
The scenario describes a situation that I recognize from my own work	3,82	1,875
It becomes clear from the scenario what the benefit is of the application	4,8	1,612
I have the feeling that I can use the described applications	4,98	1,829
It is clear what the differences are between the two situations that I had to choose from	4,57	1,63