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Implicit person theories and change in teacher evaluation:

A longitudinal field study

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Abstract

Adopting a longitudinal field study, this paper investigates if entity theorists (students who believe human attributes are fixed) are less likely than incremental theorists (students who believe human attributes are malleable) to change their evaluation of a teacher in accordance with his behavioral changes. An instructor exhibited some forgetful behaviors in the first half of a course, and ceased doing so in the second half. Consistent with our hypothesis, incremental theorists adjusted their perception of the instructor; they rated him as less forgetful accordingly at the end of the course than at the middle. Entity theorists, however, did not show this change. With improved ecological validity, this study extends previous laboratory studies to teacher evaluation.

Keywords: implicit theories, ecological validity, teacher evaluation, performance appraisal

Implicit person theories and change in teacher evaluation: A longitudinal field study

We infer traits from behaviors of people we observe. When the target persons' behaviors change, we may to various extents change our trait perception. Previous research has shown that this change in perception is more likely among individuals who believe in the malleability of human attributes. The primary objective of the present study is to test the robustness of this effect in the context of teacher evaluation. Also, the present study was conducted in a real-life setting so as to replicate previous laboratory studies with improved ecological validity.

Implicit person theories

Implicit person theories refer to people's lay beliefs about the malleability of human attributes (Dweck, 1999). People who hold an *entity theory* believe that human attributes is fixed and not changeable, whereas people who hold an *incremental theory* believe that human attributes is not fixed and can be changed (Dweck, Chiu, & Hong, 1995). Past studies have shown that implicit person theories bear strong implications for perception of social groups. For example, compared to *incremental theorists*, *entity theorists* are more prone to making stereotypical trait judgments (Dweck, 1999; Levy & Dweck, 1999; Levy, Stroessner, & Dweck, 1998).

Some research has demonstrated that implicit person theories affect expectation of

consistency in target persons' behaviors. Compared to incremental theorists, entity theorists tend to expect lesser variability and more consistency in an individual's behavior over time and across situations (Chiu, Hong, & Dweck, 1997). For example, when asked to predict how likely person A would be friendlier than person B across two different situations, participants who held the entity theory predicted a higher likelihood (Chiu et al., 1997, Study 1).

Other research examined the effect of implicit person theories on change in perception of a target person. Compared to incremental theorists, entity theorists are less likely to adjust their trait judgment of an individual when presented information inconsistent with their expectation. In one study (Erdley & Dweck, 1993, Study 1), fourth and fifth graders viewed a slide show of a boy appearing shy, nervous and isolating himself from other children. They then rated the boy on several dimensions. After that, some participants saw more slides showing consistent information (the boy continued to withdraw himself from the group and play alone), whereas some other participants saw slides showing inconsistent information (the boy involved himself in the group). It was found that entity theorists did not change in their ratings of the boy even when they were shown inconsistent information, but incremental theorists did.

Recently, Heslin, Latham, and VandeWalle (2005) extended the above findings to the workplace. The researchers found that after rating an employee's poor performance, managers who were incremental theorists were more likely to acknowledge the employee's subsequent

good performance (Heslin et al., 2005, Study 1). In addition, they were also more likely to acknowledge changes in the employee's performance when performance worsened (Heslin et al., 2005, Study 2). In another study, Heslin, Vandewalle, & Latham (2006) found that managers who were entity theorists exhibited less coaching behavior than their incremental theorist counterparts.

To summarize, it appears that compared to incremental theorists, entity theorists expect a greater consistency in a person's behaviors. Moreover, they are less likely to acknowledge changes in the person's behaviors and to alter their perceptions of the person accordingly.

Implicit person theories and change in teacher evaluation

While the reviewed studies focused on managers' appraisal and coaching of employees, or children's or adults' perception of someone they do not know in person, we extend the research to students' evaluation of their teacher. In so doing, the present study may bear some important implications for research on teaching evaluation. First, ubiquitous in many countries, the practice of students evaluating their instructor is at the end of an academic term (Benassi & Seidel, 2006). However, even within an academic term instructors may improve, students may or may not change their initial impressions accordingly. The present study investigated this potential dynamic by including two administrations of evaluation by students. Second, teaching evaluation has been found to be determined by an array of factors, including teaching style (Williams & Ceci, 1997), course workload (Marsh & Roche, 2000), nonverbal behavior

(Ambady & Rosenthal, 1993), and student motivation (Cashin & Downey, 1992). The present study identified a new factor, namely, students' implicit person theories.

Ecological validity issues

Although the effect of implicit theories on change in person perception has been examined in the reviewed studies, the present study aimed at complementing the existing research by using a more ecologically valid design (see Brewer, 2000 for the importance of this complementarity).

Past research on performance appraisal in organizational settings showed that studies using written information of the target person may systematically generate larger effect sizes than studies using direct or indirect observation of the target person (see Murphy, Herr, Lockhart, & Maguire, 1986 for meta-analytic evidence). This difference between these two types of studies can be explained by the signal-to-noise ratio hypothesis (Murphy et al., 1986; Woehr & Lance, 1991). According to this hypothesis, studies using written information typically contain stronger signals (evaluation-relevant information) relative to background noise (evaluation-irrelevant information). The perceivers in these studies faced cognitive demands much less complex than those typical in the real world. For example, they did not have to distinguish relevant information from irrelevant information, to interpret ambiguous information, and to retain information for a long period. As a result, the effect size was larger in these studies.

This notion of signal-to-noise ratio can help us evaluate the studies reviewed above. They were mainly conducted in laboratories with the researchers presenting information about the target person through hypothetical vignettes on paper (Chiu et al., 1997), slide shows (Erdley & Dweck, 1993), and video tapes (Heslin et al., 2005). There are reasons to question whether the signal-to-noise ratio in these studies is representative of person perception in the real world. In particular, the noise in the real world seemed to be under-represented in these studies.

First, the perceivers did not know the target person and did not have any interaction with the target person. However, in the real world, rarely are we asked to observe and rate a person we have no acquaintance with. Past research has shown that we evaluate people we know and strangers in different manners. For example, when evaluating an acquaintance people tend to be more lenient and less analytic (Duarte, Goodson, & Klick, 1994; Ferguson, 1949; Knight, 1923). In addition, when perceivers become more familiar with a target person, they tend to infer relatively more psychological mediating variables (e.g., construals, goals) and relatively fewer broad, uncontextualized traits from the person's behaviors (Idson & Mischel, 2001).

Second, in these studies only information relevant to the evaluation dimensions were presented. A great deal of potentially irrelevant information (e.g., target person's behaviors not linked to the evaluation dimension, tone of speech, non-verbal behavior, ambient temperature and the like) was absent or under-represented in these studies. On the contrary, the relevant information was condensed into a short presentation period. Within a very short

period of time participants rated the target person twice. For example, in the Heslin et al. study (2005, Study 1), participants first rated the target person after viewing the two video-taped incidents of poor performance, then viewed the two video-taped incidents of good performance, and rated the target person again. In the Erdley and Dweck's study (1993, Study 1), all information about the target person was presented in a 6-minute slide show. These procedures seemed to artifactually highlight the changes in the target person and leave out a lot of irrelevant information typically present in the real world.

Given the above issues, the present study was conducted to provide an ecologically more valid research design to test the effect of implicit person theories on change in person perception. This effort can help complement similar past studies which are valuable in their own right.

The Present Study

The present study took place in a social psychology class, allowing observations of the target person's behaviors for 12 weeks. Perceivers (students) became acquainted with the target person (instructor) and had interactions with him in real-life (class lectures). In the first half of the course, the instructor intentionally exhibited a few forgetful behaviors. In the second half of the course, the instructor ceased to deliberately exhibit forgetful behaviors. Students evaluated the instructor twice (at the middle of the course and the end of the course). The only manipulation in the study was the presence and subsequent absence of the

instructor's forgetful behaviors. In other words, changes in the target person were embedded in real-life rather than condensed into a short experimental session. This potentially helps increase the ecological validity of the present study.

It is hypothesized that incremental theorists would be more likely than entity theorists to adjust their perception between Time 1 (middle of the course) and Time 2 (end of the course) in accordance with the instructor's behavioral changes. We predicted an association between students' implicit person theories and the change in their perception. Specifically, compared to entity theorists, incremental theorists would be more likely to rate the instructor as less forgetful at Time 2 than at Time 1. According to Plaks, Grant, and Dweck (2005), implicit theories help people establish and maintain a subjective sense of prediction and control, and consequently people may be motivated to protect their theory by information processing distortions. It is possible that entity theorists avoid or selectively discredit information indicating the instructor's behavioral changes which violate their theory, and thus perceive lesser or even no change in the instructor. It is also possible that entity theorists may even exaggerate further their set perception, through selective attention to theory-consistent information, as a response to contradicting information. That is, they may even rate the instructor as more forgetful and less conscientious at Time 2 than at Time 1.

Method

Participants

Students in a social psychology course were told in the first class meeting that there would be a semester-long experiment on social perception. They were invited to join the study on a voluntary basis. Each participant was given a randomly generated identity code to ensure anonymity and to permit matching of his or her responses over the semester. Valid cases for the key variables ranged from 100 to 154. Nonetheless, complete listwise data were available from 58 participants (11 males and 47 females). None of the participants had previously taken the instructor's other courses; nor had any ever heard from others about the instructor. In other words, our participants were unfamiliar with the target person at the beginning of the study.

Procedures

In each of the first six weekly two-hour lectures before Time 1, the target instructor exhibited some forgetful behaviors or talked about his forgetful incidents casually in front of the class. Examples are forgetting to bring lecture handouts to class, and forgetting to tape record a television show on superstition to be used for teaching the psychology of astrology (the Appendix gives the full details). Exhibition of such behaviors stopped at the seventh week; the instructor no longer deliberately displayed forgetful behaviors until the end of the course.

Participants' implicit theories were measured on the first day of class. They also rated the instructor at two time-points (Time 1, the 6th lecture, and Time 2, the 12th lecture). The dependent measures were embedded in filler items to minimize response bias from demand characteristics. Post-experimental check revealed that none of the participants could correctly

guess the true purpose of the study nor know that the instructor's forgetfulness had been forged. In other words, the stimulus behaviors were not seen as contrived.

After all research data had been collected, at the end of the 12th lecture, participants were thoroughly debriefed. This was followed by a short description of implicit theory research, which the instructor had purposely left out from the lecture on person perception.

Measures

Implicit person theories. Participants' implicit person theories was measured via Levy and Dweck's (1997) eight-item scale (1 = *strongly disagree*, 6 = *strongly agree*). A sample entity belief item is: "The kind of person someone is is something basic about them, and it can't be changed very much". A sample incremental belief item is: "Everyone, no matter who they are, can significantly change their basic characteristics". The entity belief items were then reverse scored so that high scores indicate a tendency towards incremental theory.

Change in perceived forgetfulness. Participants' change in perception of the instructor's forgetfulness was measured by subtracting each participant's perception of the instructor's forgetfulness at Time 1 from that at Time 2 (i.e., Perceived Forgetfulness Time 2 minus Perceived Forgetfulness Time 1). Perceived Forgetfulness was measured with three items on a 6-point Likert scale (1 = *strongly disagree*, 6 = *strongly agree*). Sample items include "He is forgetful" and "He would leave his office without locking the door".

Results

Preliminary Analyses

To ensure undimensionality of the scales, the study variables were subjected to confirmatory factor analyses. As a result, we retained all three forgetfulness items and four out of eight implicit person theories items. Table 1 shows the summary results of the measurement model for Time 1 and Time 2 variables. As the value of root-mean-square residuals (SRMR) was as low as .07, the model-data fit was regarded as acceptable (Kline, 1998). The composite reliability (Diamantopoulos & Siguaw, 2000) of forgetfulness scale at Time 1, at Time 2 and that of implicit person theories scale were .71, 62 and .71 respectively.

Table 2 presents the means, standard deviations, and intercorrelations of all study variables by the listwise sample (N = 58) for subsequent analyses.

Hypothesis Testing

We predicted an association between implicit person theories and change in perception. Specifically, a negative correlation between implicit person theories and change in perceived forgetfulness was expected: students who were more oriented toward an incremental theory would be more likely to rate the instructor as less forgetful at Time 2 than at Time 1. Indeed, such pattern was suggested in Table 2 that shows r = -.34 (p < .01, two-tailed) between these two variables. This relationship would be tested by the following regression analysis.

As shown in Table 3, change in perceived forgetfulness was first regressed on the number of lectures attended and gender in Step 1. The two control variables did not explain

the variance of the change. Entering implicit person theories ($\beta = -.37$, $p < .01$, two-tailed) in the next step, however, resulted in a significant increase in the variance accounted for ($\Delta R^2 = .13$, $p < .01$, two-tailed). The slope of implicit person theories on the change was negative and depicted in Figure 1. The overall model explained 14% of the variance (adjusted $R^2 = .10$) of the change in perceived forgetfulness, $F(3, 57) = 3.02$ ($p < .05$, two-tailed).

In addition, we found a significant difference between the relationship of implicit person theories with perceived forgetfulness for Time 1 and that for Time 2. The correlation between implicit person theories and perceived forgetfulness for Time 1 was $r = .12$ ($p = .39$, two-tailed) whereas that for Time 2 was $r = -.12$ ($p = .36$, two-tailed). Although both coefficients were not significant, their signs were opposite and markedly different. In fact, our present sample size would have been able to detect medium effect size only at power .60 (Rosenthal & Rosnow, 1991). The Hotelling-Williams test (Williams, 1959) was used to assess the equality of these two dependent correlations. The test did indicate a significant difference, $t(55) = 2.64$ ($p < .01$, two-tailed). Consistent with our hypothesis, the incremental theorists in our sample appeared to have perceived a drop of forgetfulness at Time 2 from Time 1.

Discussion

"Replication is a critical scientific activity, one not given its due in the behavioral sciences" (Kline, 2004, p.247). The present field study replicates past laboratory studies for

improved ecological validity. Our hypothesis regarding the impact of implicit person theories on perception change was supported. Students who were more oriented toward an incremental theory were more likely to adjust their perception of the instructor according to his changes; they rated him as less forgetful at Time 2 than at Time 1. Students who were more oriented toward an entity theory, however, were less likely to show this change. This finding is consistent with the previous implicit person theories studies (e.g., Chiu et al., 1997; Heslin et al., 2005). Interestingly, the entity theory-oriented students appeared to perceive the instructor as even more forgetful at Time 2, consistent with Plaks and colleagues' argument (Plaks et al., 2005).

One point worth noting is that, in the present study, the change in perception was small (mean of change in perceived forgetfulness = -.11). This small change may be taken as a testimony of the importance of the ecological validity issues aforementioned. Instead of presenting only information relevant to the evaluation dimensions within a very short time span (as done in previous laboratory studies), the behavioral changes of the target person in the present study was embedded in a 12-week class. The signal-to-noise ratio in the present study was arguably more representative of the reality. It is conceivable that in such a more ecologically valid context, people naturally show smaller change in perception.

The present study contributes to the literature on the effect of implicit person theories on person perception in two ways. First, to the best of our knowledge, it is the first to test the

effect in a real-life setting (Heslin et al. (2006) seems to be the first to do so on coaching behavior but not on person perception). Our study addresses critical ecological validity issues, and shows that the effect exists even in the noisier real world. This increases our confidence in the robustness of the effect. Second, our study shows the pervasiveness of the effect in a context not examined before, namely, students' evaluation of their teacher. This study also bears important implications for teaching evaluation. While instructors may change their behavior within a single semester, students may or may not accordingly change their perception. One factor that has been overlooked in studies on teaching evaluation is the students' implicit person theories.

Apparently, as seen in the present study and past studies, incremental theorists are more sensitive to changes in other people. If this conclusion is agreed, then it would be of value to induce incremental theory in people so as to enhance their sensitivity. Heslin, Latham and VandeWalle (2005, Study 4) described how sustainable orientation towards incremental theory can be induced through the implementation of self-persuasion principles in a 90-minute workshop. In addition, future research could further investigate the effect of implicit person theories in other applied settings. For instance, how would trainees evaluate their trainers in a business organization? In services marketing, how would customers evaluate their long-term service providers? In an educational setting, how would a teacher's assessment of school children's academic progress be colored by the teacher's own implicit person theory? We

believe that investigations conducted in real-life settings and well-controlled laboratories studies could jointly generate useful insights to our understanding of person perception. This is the primary objective of the present study.

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Appendix

Forgetful Behaviors Displayed by Target Person

Week	Scenarios
1st	The instructor was introducing the course requirements and explains the penalty for not switching off cellular phones calls in class. But then his own phone rang…
2nd	The instructor took sips from his bottled water placed on the lectern. As he paced about during the lecture, he left the bottle on a desk. Later on, when the instructor could not find where the bottle was. He needed reminder from students to locate the water bottle.
3rd	The instructor told the class, "There was a TV documentary on people's beliefs in the mystic power of crystals which I had intended to show as part of my teaching material today. Unfortunately, only when the show ended that I found the “record” button had never been pressed…."
4th	The instructor did not bring lecture handouts to class, and had to be reminded by a student. An assistant then went out to fetch the handouts.
5th	Although the instructor usually gave students a toilet break at 11:30am, it was already 11:45am but the lecture was still going on. Subsequently the instructor asked the class if it was okay not to have a break on that day.
6th	The instructor was about to use his laser pointer, but could not find it in his pockets and the briefcase. He then used a pen to substitute.

Table 1.

Results of Confirmatory Factor Analysis for Time 1 and Time 2 Variables

Variable items	T1Fgt	T2Fgt	IPT	R^2	Uniqueness
He is forgetful.	.50			.25	.75
He would leave his office without locking the door.	.76			.58	.42
He would need someone to remind him of appointments.	.73			.53	.47
He is forgetful.		.55		.30	.70
He would leave his office without locking the door.		.58		.34	.66
He would need someone to remind him of appointments.		.65		.42	.58
As much as I hate to admit it, you can't teach an old dog new tricks. People can't really change their deepest attributes. (reversed)			.44	.19	.81
The kind of person someone is is something basic about them, and it can't be changed very much. (reversed)			.76	.58	.42
Everyone is a certain kind of person, and there is not much that they can do to really change that. (reversed)			.70	.49	.51
Everyone, no matter who they are, can significantly change their basic characteristics.			.53	.28	.72
Composite reliability :	.71	.62	.71		

	Overall model fit indices:			
χ^2 / *df*	RMSEA	SRMR	GFI	AGFI
73.27 / 29	.08	.07	.94	.89

Note. Factor loadings shown here are completely standard solutions.

T1Fgt=Perceived forgetfulness Time 1; T2Fgt:=Perceived forgetfulness Time 2; IPT=Implicit person theories.

RMSEA: Root-mean-square error of approximation. SRMR: Standardized root-mean-square residual. GFI: Goodness-of-fit index. AGFI: Adjusted goodness-of-fit index.

Table 2

Means, Standard Deviations and Inter-correlations of Study Variables (N = 58)

		Mean	SD	1	2	3	4
1	IPT	3.12	.84	-			
2	T1Fgt	3.31	.88	.12	-		
3	T2Fgt	3.20	.87	-.12	.75***	-	
4	T21Fgt	-.11	.61	-.34**	-.36**	.34**	-
5	Gender[a]	1.81	.40				
6	Lectures Attended[b]	9.55	.71				
	Control for gender and lectures attended (*df* = 54)						
1	IPT			-			
2	T1Fgt			.13	-		
3	T2Fgt			-.13	.74***	-	
4	T21Fgt			-.36**	-.39**	.33*	-

Note. IPT=Implicit person theories. T1Fgt= Perceived forgetfulness Time 1; T2Fgt= Perceived forgetfulness Time 2;. T21= Values at Time 2 minus Time 1.

a. 1=male; 2=female. b. total number of lectures throughout was 12. Minimum number of lectures attended was 7 out of 12.

***p<.001, **p<.01, *p<.05, two-tailed.

Table 3

Summary of Regression Analysis Predicting Change in Perceived Forgetfulness (N = 58)

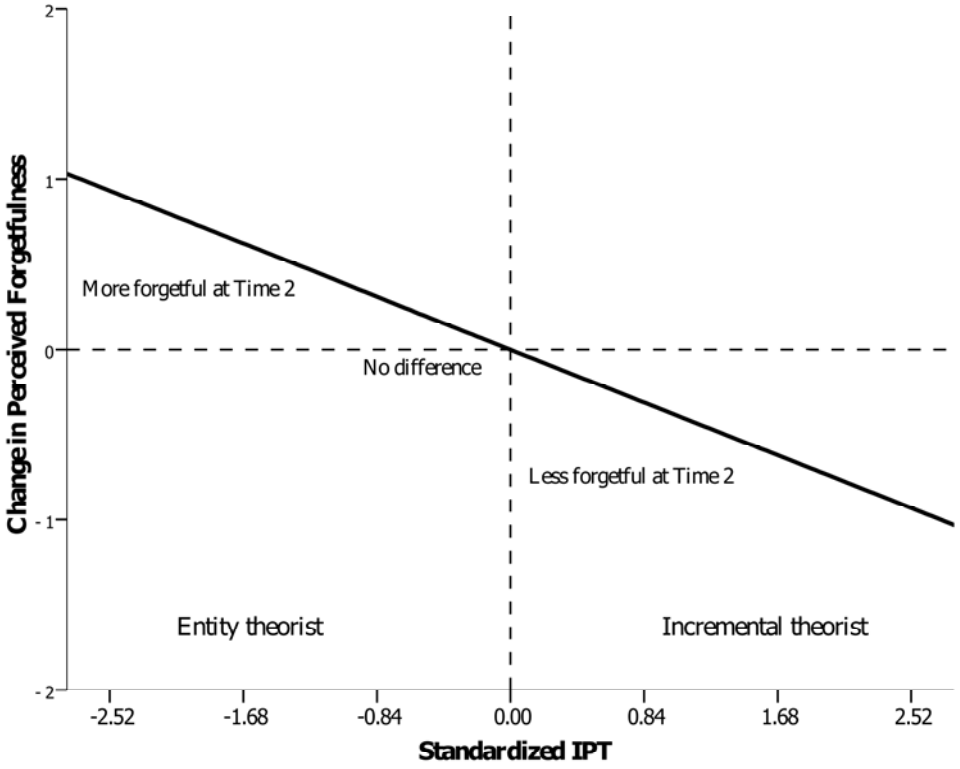
		B	*SE B*	β	Δ R^2	R^2	Adjusted R^2 (η^2)
Step 1	Gender	-.24	.20	-.15$^{n.s.}$	.01	.01	-.02
	Lectures attended	-.07	.11	-.08$^{n.s.}$			
Step 2	IPT	-.27	.09	-.37**	.13**	.14	.10
							$F(3, 57) = 3.02^{*}$

Note. Coefficients shown here are from the final model. Intercept values are omitted from the table.

$^{**}p<.01$, $^{*}p<.05$, two-tailed. n.s. = non-significant.

Figure Caption

Figure 1. Predicted change in perceived forgetfulness as a function of implicit person theories.


Change in Perceived Forgetfulness
2
1
0
-1
-2
More forgetful at Time 2
No difference
Less forgetful at Time 2
Entity theorist
Incremental theorist
-2.52
-1.68
-0.84
0.00
0.84
1.68
2.52
Standardized IPT