

## Research Note

# Trust Is in the Eye of the Beholder: A Vignette Study of Postevent Behavioral Controls' Effects on Individual Trust in Virtual Teams

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Research in face-to-face teams shows conflicting results about the impact of behavioral controls on trust; some research shows that controls increase the salience of good behavior, which increases trust while other research shows that controls increase the salience of poor behavior that decreases trust. The only study in virtual teams, which examined poorly functioning teams, found that controls increased the salience of poor behavior, which decreased trust. We argue that in virtual teams behavioral controls amplify the salience of *all* behaviors (positive and negative) and that an individual's selective perception bias influences how these behaviors are interpreted. Thus the link from behavioral controls to trust is more complex than first thought. We conducted a  $2 \times 2$  experiment, varying the use of behavioral controls (controls, no controls) and individual team member behaviors (reneging behaviors designed to reduce trust beliefs and fulfilling behaviors designed to increase trust beliefs). We found that behavioral controls did amplify the salience of *all* behaviors; however, contrary to what we expected, this actually weakened the impact of reneging and fulfilling behaviors on trust. We believe that completing a formal evaluation increased empathy and the awareness of context in which the behaviors occurred and thus mitigated extreme perceptions. We also found that behavioral controls increased the selective perception bias which induced participants to see the behaviors their disposition to trust expected rather than the behaviors that actually occurred.

*Key words:* virtual teams, trust, controls, disposition to trust

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## 1. Introduction

Trust among members of virtual teams is important (Powell et al. 2004). Trust, defined as “the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another” (Rousseau et al. 1998, p. 395) can affect both the processes and outcomes of virtual work (Dirks and Ferrin

2001; Furst et al. 1999; Guinan et al. 1998; Jarvenpaa et al. 1998, 2004; Larsen and McInerney 2002; Paul and McDaniel 2004; Pinto et al. 1993; Robert et al. 2008). Trust within virtual teams is driven by each individual member's perception of how well other members' behaviors foster team goals (Butler et al. 1999, Jarvenpaa and Leidner 1999, Robert et al. 2009).

Higher trust beliefs by individual team members can improve performance through both direct and indirect means (Dirks and Ferrin 2001).

Controls are commonly used to manage virtual teams (Kayworth and Leidner 2002; Kirsch 2004; Kirsch et al. 2002, 2010). Implementing controls, similar to promoting the development of trust, should increase the likelihood that members will collaborate and coordinate to achieve team goals (Coletti et al. 2005). In this study, we adopt Ouchi's (1977, p. 97) definition of controls as systems for "monitoring and evaluation." Controls can be used to monitor and evaluate behavior or monitor and evaluate outputs (Ouchi 1977). Behavioral controls focus on how work is performed, while output controls focus on the products of that work (Kirsch 2004, Kirsch et al. 2010, Maruping et al. 2009, Ouchi 1977, Piccoli and Ives 2003). Examples of behavioral controls include the specification of work assignments, project plans, performance evaluations, and the articulation of rules and procedures (Henderson and Lee 1992, Kirsh 1997, Ouchi 1977, Piccoli and Ives 2003, Pinto et al. 1993). Controls change behavior such that individuals are more likely to behave "better" (Henderson and Lee 1992, Kirsh 1997) and thus are more likely to reach team objectives (Alnvaimi et al. 2010).

Although trust and behavioral controls are two mechanisms that can have similar affects within teams, their relationship is not fully understood (Bijlsma-Frankema and Costa 2005, Emsley and Kidon 2007). In fact, despite various attempts across multiple disciplines, no body of research has yielded a consistent pattern of theory or empirical evidence about the impact of behavioral controls on trust (Bijlsma-Frankema and Costa 2005, Coletti et al. 2005, Emsley and Kidon 2007, Zaheer and Venkatraman 1995). Some research argues that behavioral controls increase trust by providing a "track record for those who perform well" (Das and Teng 1998, p. 501) (see also Coletti et al. 2005, Sitkin 1995, Sydow and Windeler 2003). Other research argues that behavioral controls reduce trust because they highlight poor behavior (Langfred 2004).

Byron (2008) argues that there is an inherent negative bias in digital communication so that statements and behaviors are more likely to be perceived negatively than the same statements or behavior in face-to-face environments. Consequently, research in virtual teams argues that behavioral controls increase the salience of poor behavior and thus have a direct negative effect on trust:

Our analysis shows that the behavior control mechanisms typically used in traditional teams have a significant negative effect on trust in virtual teams.

(Piccoli and Ives 2003, p. 365)

Behavior control had, on average, a negative effect on trust in the temporary virtual teams in this study because it tended to increase the salience of incidents caused by renegeing and incongruence and made some individuals more vigilant.

(Piccoli and Ives 2003, p. 387)

Finally, our results regarding the negative impact of behavior control suggest an important, and distressing, dynamic. Managerial interventions that focus individuals' attention on deadlines and work progress—the very intervention that is designed to mitigate communication and coordination problems—can promote trust decline . . . . Note that this dilemma does not only pertain to the control mechanisms we studied; rather, any managerial intervention that increases salience and vigilance may contribute to weaken virtual team trust.

(Piccoli and Ives 2003, p. 387)<sup>1</sup>

The use of behavioral controls in virtual teams can be challenging. Behavioral controls normally involve team members monitoring and evaluating the behaviors of their teammates (Ferrin et al. 2007, Maruping et al. 2009, Piccoli and Ives 2003). This becomes more difficult for virtual teams whose members cannot directly observe the behavior of their teammates and must infer judgments about behavior from lean textual exchanges (Byron 2008, Cramton 2001, Hinds and Bailey 2003). Despite this, behavioral controls are used in some virtual teams as well as other collaborative contexts (Gallivan and Depledge 2003). Therefore, it becomes important to understand how behavioral controls work when team members use lean textual exchanges in a virtual team context.

In this paper, we follow Piccoli and Ives (2003) and examine how controls influence the way behavior is interpreted in a virtual environment and how this affects trust formation; our focus is not on how controls influence behavior. We argue that behavioral controls *indirectly* affect trust beliefs among virtual team members. Behavioral controls influence what individual team members perceive, which in turn influences trust beliefs. First, behavioral controls make all behavior more salient. In well-functioning teams—teams in which members fulfill their commitments, communicate well, complete tasks on time, and accomplish goals—controls should increase trust beliefs because they should make those well-functioning behaviors more salient. And vice versa: in dysfunctional teams, whose members renege on commitments, we would expect a reduction in trust beliefs because the controls will highlight dysfunctional behaviors.

Second, the way individuals interpret behavior is affected by their a priori beliefs (Dirks and Ferrin

<sup>1</sup> This research focused primarily on poorly functioning teams, so its conclusions might be influenced by that focus.

2001, 2003). Individuals tend to focus on information that confirms their initial beliefs and to discount information that disconfirms those beliefs (Fiske and Taylor 1991, Lord et al. 1979, Robinson 1996, Vidmar and Rokeach 1974, Wood 1982). Although controls increase the salience of all behavior, the selective perception bias in information processing will cause controls to strengthen the effect of an individual's disposition to trust (Fiske and Taylor 1991, Lord et al. 1979, Vidmar and Rokeach 1974, Wood 1982). Thus this paper contributes to the literature by providing a more nuanced view of the way in which behavioral controls affect trust formation in virtual teams—by altering the impact of both the trustee's behavior and the trustor's disposition to trust.

## 2. Theory and Research

### 2.1. Trust in Virtual Teams

Trust belief is an individual-level construct. Trust belief is the extent to which an individual believes it is appropriate to be vulnerable to another person (Mayer et al. 1995). Trust beliefs are driven in part by two major factors (See Figure 1).

The first factor is an individual's disposition to trust, which individuals import into collaborative contexts (Brown et al. 2004, Gurtman 1992, Mayer et al. 1995, Sorrentino et al. 1995). Disposition to trust is a "generalized attitude" learned from both observed behavior and personal experiences of fulfilled and unfulfilled promises (Rotter 1967). In short, some people are simply more or less inclined to trust others (Mayer et al. 1995). Although disposition to trust is "akin to a personality trait" and in some cases has been treated as one, it is a general tendency that forms from past experiences (McKnight et al. 1998; Rotter 1967, 1971, 1980). Disposition to trust has been shown to have a direct positive relationship with trust belief (Aubert and Kelsey 2003, Jarvenpaa et al. 1998, Robert et al. 2009).

The second factor that influences an individual's trust belief is his or her individual cognitive assessment of the virtual team members' behaviors—whether they fulfill or renege on the team's needs (Sydow and Windeler 2003). Trust beliefs are typically influenced by an assessment of the trustee's ability, integrity, and benevolence because all three affect the trustee's capability to fulfill the team's needs (Jarvenpaa et al. 1998, Mayer et al. 1995, Mayer and Davis 1999, Robert et al. 2009). Behaviors that influence assessments of ability are those that demonstrate whether or not a team member is capable (i.e., possesses the knowledge and skills necessary) to complete a given task (Mayer et al. 1995). An individual is perceived as having high integrity when others believe that he or she holds a set of core principles that are honorable and can be used to predict their behavior (Mayer et al. 1995). Behaviors that influence assessments of integrity are those that indicate whether or not a team member has fulfilled their commitments (Furst et al. 1999, Mayer et al. 1995, Morgan and Hunt 1994, Schaubert 1996). Team members are perceived as being benevolent when it is believed that they have the team's best interest in mind (Mayer et al. 1995). Benevolence is manifested in such actions as performing an undesirable task or helping another team member with a task (Furst et al. 1999). Ability, integrity, and benevolence have all been found to influence trust beliefs in virtual teams (Jarvenpaa et al. 1998, Robert et al. 2009).

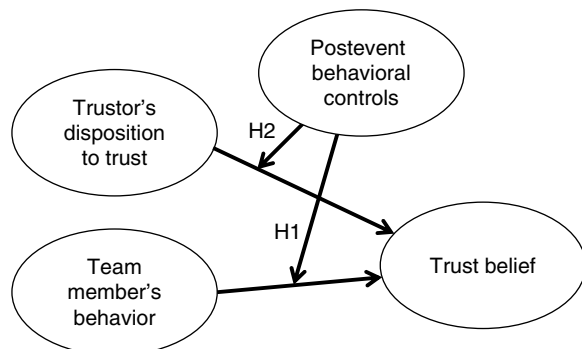
### 2.2. Postevent Behavioral Controls and Trust Beliefs

Controls encourage individuals to monitor and evaluate behaviors and/or outputs (Ouchi 1977). Controls are used to regulate the behavior and to provide feedback to increase the probability of reaching team goals (Henderson and Lee 1992; Kirsch 1997, 2004).

There are many different types of controls. Controls can be formal (imposed from outside the team) or informal (imposed from within the team) (Eisenhardt 1985, Kirsch 2004, Kirsch et al. 2010, Ouchi 1979). Controls can monitor and evaluate either output, such as the accomplishment of predetermined goals and deliverables (Eisenhardt 1985, Ouchi 1977, Snell 1992, Henderson and Lee 1992, Atuahene-Gima and Li 2002), or behavior (Henderson and Lee 1992; Kirsch 1997, 2004; Ouchi 1977). Behavioral controls can be pre-event rules that are used to guide behavior (e.g., e-mails must be answered within 24 hours) or postevent controls that evaluate behavior after the behavior has occurred (e.g., after-action reports).

Our focus is on postevent behavioral controls (PEBC), such as performance reports, because they fit the fundamental definition of control as "monitoring and evaluation." PEBC are relatively simple

Figure 1 Research Model



to implement and are commonly used by organizations (Kirsch 2004). The use of PEBC in virtual teams has been the subject of past information systems research (Piccoli and Ives 2003). PEBC are also likely to have an impact on behavior: when individuals know that their behavior is being monitored and evaluated, they are more likely to perform in the desired manner (Henderson and Lee 1992; Kirsch 1997, 2004; Ouchi 1977).

PEBC are prevalent in traditional face-to-face teams (Kirsch 1997, 2004). Despite this, the relationship between PEBC and trust belief in face-to-face teams is still unclear (Bijlsma-Frankema and Costa 2005, Inkpen and Currall 2004, Sengun and Wasti 2007). There are two divergent views on the relationship between PEBC and trust beliefs, but both share similar logic. Both views agree that PEBC influence what people infer from behaviors, and this in turn influences trust beliefs. Both views agree that the use of PEBC increases the motivation of team members to gather information about their team processes and individual team members' performance (Scholten et al. 2007). Thus team members are more vigilant when PEBC are used. One view argues that PEBC primarily increase the salience of behavior that fulfills the needs of the team, which increases trust beliefs (Coletti et al. 2005, Sitkin 1995). The other view argues that PEBC primarily increase the salience of renegeing behavior that hurts the team and thus PEBC ultimately reduce trust beliefs (Das and Teng 1998, Langfred 2004).

Both views have empirical support, although the only empirical evidence available from virtual teams suggests that PEBC decrease trust beliefs (Piccoli and Ives 2003); there is no evidence to suggest whether or not PEBC can increase trust beliefs in virtual teams. Unlike face-to-face teams in which members can directly observe the behavior of their teammates, members of virtual teams usually rely on lean textual exchanges as their primary source of communication. There is an inherent negativity bias in lean textual communication; text messages are likely to be perceived to be intensely more negative than intended (Byron 2008). Thus the use of PEBC to increase the salience of communication, combined with the negativity bias inherent in lean media, might cause an increase in negative perceptions among virtual team members, even when there is little to prompt negative judgments.

We argue that PEBC affect trust belief in two separate ways: by moderating the influence of (1) the trustee's behavior and (2) the trustor's disposition to trust. First, PEBC increase vigilance (Scholten et al. 2007) and make *all* behavior more salient (both fulfilling behavior and renegeing behavior). Interpretation requires cognitive effort because "interpersonal behaviors are usually ambiguous to some degree;

therefore interpretation is used to reduce ambiguity" (Dirks and Ferrin 2001, p. 459). However, individuals often take short-cuts to reduce cognitive effort that, unfortunately, do not always produce valid interpretations (Chaiken et al. 1999, Chaiken and Maheswaran 1994, Dirks and Ferrin 2001). In this context, trust belief can be based on an inaccurate assessment of another's teammate's behavior.

PEBC increase an individual's motivation to perform monitoring and evaluation in a more systematic fashion (Henderson and Lee 1992; Kirsch 1997, 2004; Ouchi 1977). When individuals know they will be asked to evaluate behavior after it occurs, they are more attentive to the behavior and monitor it more closely (Darling et al. 2005, Johnston and Dark 1986). Individuals completing a PEBC are more likely to consider the elements it contains when forming trust beliefs because the wording of questions on the evaluation primes respondents in ways that influence their information processing (Wittenbrink et al. 1997). PEBC encourage team members to closely examine behavior: what was the task, who was assigned, was it performed successfully, what issues arose, were the issues resolved, etc. (Darling et al. 2005). In well-functioning teams, PEBC increase the salience of the members' behaviors that fulfill the needs of the team, which should increase trust beliefs (Coletti et al. 2005, Sydow and Windeler 2003). In dysfunctional teams, PEBC increase the salience of the members' renegeing behavior, which decreases trust beliefs (Piccoli and Ives 2003).

In essence, PEBC moderate the influence of behavior (and the perception of ability, benevolence and integrity) on trust beliefs. Because PEBC increase the salience of *all* behavior, they increase the *strength* of the relationship between a team member's behaviors and trust beliefs. Thus PEBC will *increase* the positive relationship when team member's behavior is fulfilling and *increase* the negative relationship when behavior is renegeing. In the first case, the use of PEBC will increase trust beliefs, whereas in the latter it will decrease trust beliefs. Therefore, we have Hypothesis 1.

**HYPOTHESIS 1 (H1).** *The presence of postevent behavioral controls will increase the strength of the impact of trust behaviors on trust belief.*

Second, PEBC affect the way that meaning is assigned to behavior by way of an individual's disposition to trust. Individuals working in the presence of PEBC know they will be called upon to make formal judgments about the behaviors of others after the events have transpired. This knowledge of the need to formally assess others will induce individuals to begin forming their assessments of other team members as they begin to observe behavior

before they have received all the available information about behavior—they will be cued to form judgments as behavior unfolds, rather than assessing the complete “package” of behavior after the fact. Initial trust beliefs, made before information about behavior is available, rely heavily on the disposition to trust (Jarvenpaa et al. 1998, Mayer and Davis 1999, Mayer et al. 1995, Robert et al. 2009).

The trustor’s disposition to trust (and the initial trust beliefs based on it) will shape subsequent trust beliefs (Robert et al. 2009). Selective perception is a form of biased information processing that often leaves individuals who view the same events with different interpretations of those events (Hastorf and Cantril 1954, Keil et al. 2007). Individuals who engage in selective perception see what they expect to see by focusing on the information that supports their initial judgments and discounting information that opposes them (Dirks and Ferrin 2001, Fiske and Taylor 1991, Lord et al. 1979, Robinson 1996, Vidmar and Rokeach 1974, Wood 1982). Individuals are predisposed to see what they expected to see, so they interpret observed behavior using their initial dispositions. This disposition colors how an individual perceives a behavior, and how he or she derives meaning and ascribes personal characteristics from it (Chaiken et al. 1999, Chaiken and Maheswaran 1994, Dirks and Ferrin 2001, Prentice and Gerrig 1999). As a result, an individual’s disposition to trust will influence how he or she assesses behavior and forms trust beliefs based on it.

There are two ways behavioral controls might increase the selective perception bias. First, disposition might be a filter for perception. Individuals tend to focus on information that supports their initial judgments and discount information that opposes them (Dirks and Ferrin 2001, Fiske and Taylor 1991, Lord et al. 1979, Robinson 1996, Vidmar and Rokeach 1974, Wood 1982). Individuals with a high disposition to trust will be more likely to notice trust-engendering behaviors while those with a low disposition to trust will be more likely to notice trust-inhibiting behaviors (Dirks and Ferrin 2001). This information seeking and focus might be deliberate or unconscious, but it has the net effect of collecting information that supports the individual’s trust beliefs formed before behavior is observed: information challenging an individual’s disposition is overlooked.

Second, disposition might be the lens through which behavior is interpreted (Chaiken et al. 1999, Chaiken and Maheswaran 1994, Prentice and Gerrig 1999). The individual is aware of behavior, but the way in which the behavior is interpreted depends upon the individual’s disposition, which influences how individuals derive meaning and ascribe ability, integrity, and benevolence to the behavior of a team

member. For example, suppose a team member had promised to complete and e-mail a report by 11:00 P.M. and sent it at 10:59 P.M. One individual high in disposition to trust might feel that this behavior is an indication of someone they should trust (i.e., the team member fulfilled the commitment). However, another individual low in disposition to trust might view the submission, *one minute before the due time*, as a sign of someone who barely lived up to their commitment and cannot be trusted because in the future they might not fulfill their commitments. The *same* behavior viewed by different individuals yields *different* trust beliefs because each uses a different measure to assess the same characteristics that influence their trust belief.

In summary, we argue that the use of PEBC will induce individuals to begin forming trust beliefs as behavior unfolds. Because initial trust beliefs are made with little or no behavior information, this will magnify the impact of an individual’s disposition to trust on trust beliefs. Individuals high in disposition to trust will be more likely to notice and/or interpret behaviors as more trustworthy when they are working under PEBC. Individuals low in disposition to trust will notice and/or interpret behaviors as less trustworthy when they are working under PEBC. PEBC therefore will strengthen the relationship between an individual’s disposition to trust and his or her trust beliefs. Thus we have Hypothesis 2.

**HYPOTHESIS 2 (H2).** *The presence of postevent behavioral controls will increase the strength of the impact of an individual’s disposition to trust on trust belief.*

### 3. Method

Trust belief is an individual level construct requiring an individual to assess another individual and form a trust belief about him or her. In virtual teams, this assessment is normally conducted primarily through lean textual discourse. Our context was trust beliefs formed by individuals in virtual teams, so this presented us with several challenges. We needed a method to precisely control individual behavior to ensure that all participants were able to observe the same behavior and form trust beliefs about it, influenced only by their own disposition to trust and the presence or absence of PEBC. We also needed to separate the influence of PEBC (which have been shown to influence behavior) from the behavior itself. In short, we needed a method that would allow us to rule out whether it was the use of PEBC or the actual behavior that was influencing trust beliefs.

We could have used naturally occurring or experimentally created teams and had team members work with and without PEBC, but this would have enabled the presence of PEBC to influence behavior and

would have introduced a confound due to the inability to clearly separate the influence of PEBC from the influence of behavior. Likewise, the behaviors of individual team members would have varied from team to team, so we could not provide precise control over the behaviors.

Added to the need to precisely manipulate PEBC and separate their influence from that of behavior was the need to present the behavior in the same textual format used by virtual teams. Therefore, the experiment was implemented through the use of vignettes. Vignettes are “stories about individuals, situations and structures which can make reference to important points in the study of perceptions, beliefs, and attitudes” (Hughes 1998, p. 381). Vignettes are simulations of real events (Gould 1996). Although vignettes are rarely used in the IS field (Couger 1989, Gattiker and Kelley 1999, Harrington 1996, Jarvenpaa and Staples 2000, Robert et al. 2009), they are an experimental technique for the study of perceptions, beliefs, and attitudes (Hughes 1998, Murphy et al. 1986, Pierce et al. 2000). Vignettes have been used in such diverse fields as management, psychology, anthropology, and economics for over 50 years (e.g., Baard et al. 2004, De Cremer et al. 2007, Herskovits 1950, Norman et al. 2005, Scott and Colquitt 2007).

Vignettes have been used both in the study of trust (Buskens and Raub 2002, Elsbach and Eloffson 2000, Nakayachi and Watabe 2005, Robert et al. 2009) and team collaboration (Amabile et al. 2001, Colquitt and Jackson 2006, Jarvenpaa and Staples 2000). For example, much of the research on media richness uses vignette studies in which participants are presented with a hypothetical situation and asked about their beliefs and perceptions (e.g., Daft et al. 1987, El-Shinnawy and Markus 1992, Russ et al. 1990).

A recent meta-analysis revealed that the correlation between beliefs and reactions to decision making in studies that used vignettes was virtually the same as that for nonvignette studies: 0.34 versus 0.33 (Shaw et al. 2003). In other words, the meta-analysis found that studies employing vignettes reached the same conclusions as traditional nonvignette studies. Other studies have drawn similar conclusions (De Cremer et al. 2007, Rahman 1996). This provides some evidence to support the view that individuals respond quite similarly whether they are presented with a hypothetical situation using a vignette or a hypothetical situation in a traditional lab experiment.

Vignettes allow researchers to assess the impact of the independent variables on the dependent variables with precise control. This enables researchers to analyze the influence of the information presented (independent variables) on the participants’ judgmental process in a much less biased and contaminated manner than if experimental participants were able

to interact (Greenberg and Eskew 1993). The use of vignettes has been shown to reduce the social desirability bias that experimental participants often feel (Hughes and Huby 2002). In our study, the use of vignettes permitted us to tightly control behavior and separate it from the influence of PEBC, something that would have been almost impossible in a traditional team experiment. In addition, vignettes allowed us to present the behavior of virtual team members in a similar textual format used by virtual teams in field settings. Vignettes also have limitations, which we discuss in the limitations section.

### 3.1. Participants

Three hundred and seventeen undergraduate business students at a large U.S. public university participated in this study. Their participation was voluntary, and they received course credit for their participation. The average age of the participants was 19.6 years old, and 30% were female. Participants were randomly assigned to one of the four treatments, with between 75 and 81 participants in each treatment.

### 3.2. Task

A vignette was used to implement the task. The vignette presented communications among three members of a student virtual team drawn from three universities who worked over the Internet, using e-mail to complete a course project that required them to develop a Web site. The vignette consisted of two parts. The first part provided information about the project (deliverables, due date, percentage points of the students’ grades) and information about the three characters in the team (Carol, Brad, and Greg). All three characters were portrayed as undergraduate students with similar backgrounds, education levels, and majors.

The second part of the vignette was the communication among the characters as they worked on the team project using e-mail over a two-week time period. This was presented as a series of e-mail messages among the three team members as they worked on the project. See Online Appendix 1<sup>2</sup> for a sample vignette.

### 3.3. Independent Variables

The experiment was a 2 × 2 factorial design, varying behaviors (fulfilling, reneging) and the use of PEBC (PEBC, no PEBC). Disposition to trust, the third independent variable, was measured (not manipulated).

Behaviors (fulfilling, reneging) were manipulated by altering the e-mail messages presented in the vignette. In the fulfilling behaviors treatment, all

<sup>2</sup> An electronic companion to this paper is available as part of the online version at <http://dx.doi.org/10.1287/isre.1110.0364>.

three characters exhibited behaviors that fulfilled the needs of the team; these behaviors displayed ability (producing high-quality work products), benevolence (caring for other team members), and integrity (completing work products on time as they committed to do). In the renegeing behavior treatment, all three characters exhibited behaviors that renegeed on meeting the needs of the team; these behaviors displayed lower ability (producing work products that other characters complained about and had to redo), lower benevolence (refusing to work on tasks requested by others), and lower integrity (failing to complete tasks on time as agreed).

By definition, PEBC are designed to induce team members to increase their monitoring and evaluating of the behavior of other team members via an intervention that occurs after that behavior has completed (Ouchi 1977). The use of PEBC was manipulated in two ways. First, to encourage monitoring, participants in the PEBC treatment were informed prior to reading the e-mail communication that they would perform a postevent evaluation and would evaluate each of the three characters' responsibilities and performance. Second, to provide an evaluation, participants completed the report after reading the e-mail communication but prior to reporting their trust beliefs (the report was similar to that used by Piccoli and Ives 2003). Participants in the no PEBC treatment were *not* informed of the report prior to reading e-mail communication but they performed it *after* reporting their trust beliefs so that the report did not influence their trust beliefs. The first question on the evaluation report was open-ended and asked the participant to report on the responsibilities undertaken by the character. The next two were Likert-scale questions asking the participant to evaluate the character's effectiveness and whether he or she failed to meet her responsibilities. Next, the report asked participants to identify which student contributed the most and the least to the project and to explain their reasons. It closed by asking participants to assign a letter grade to each character and to give the team an overall evaluation. See Online Appendix 2.

Disposition to trust was measured using six items (seven-point agree-disagree scales) adapted from Schoorman et al. (1996) and Jarvenpaa et al. (1998). The Cronbach's alpha was 0.70, indicating adequate reliability. See Online Appendix 3 for the items. A GLM analysis confirmed that there were no significant differences in disposition to trust across the four treatments suggesting that the random assignment was appropriate (PEBC ( $F(1,313) = 0.49$ ,  $p = 0.485$ ), behavior ( $F(1,313) = 0.91$ ,  $p = 0.342$ ) and interaction ( $F(1,313) = 3.20$ ,  $p = 0.075$ ).

### 3.4. Dependent Variables

The dependent variable was trust belief, which was measured using 14 items (7-point agree-disagree scales) adapted from Schoorman et al. (1996), Jarvenpaa et al. (1998), and Mayer and Davis (1999); see Online Appendix 3. Trust belief was assessed separately for *each of the three characters* in the vignette; there is one set of three dependent variables (trust belief in character 1, trust belief in character 2, and trust belief in character 3). The Cronbach's alphas were 0.91, 0.96, and 0.94, indicating adequate reliability. Participants reported higher trust beliefs in some characters so we used the z-score of the trust belief in each character to provide a common basis of comparison.

### 3.5. Manipulation Check

We designed the vignettes to present two very different patterns of behavior to the participants. We included a manipulation check to confirm that the behavior in the two vignettes was actually perceived differently. We asked participants to assume they had been assigned to work with the group in the vignette on a new project and asked them about their overall level of trust belief in the group as a whole (as opposed to the trust in the individual members). We used 5 items (7-point agree-disagree scales) adapted from Jarvenpaa et al. (1998), and Mayer and Davis (1999) that were separate and distinct from the items used to measure individual level trust for our hypotheses; see Online Appendix 3. The Cronbach's alpha was 0.75, indicating adequate reliability. GLM found that participants in the renegeing behavior treatment perceived lower overall levels of trust belief in the group than those in the fulfilling behavior treatment ( $F(1,313) = 147.44$ ,  $p < 0.001$ ). We conclude that the vignette manipulation was successful in presenting two different patterns of behavior.

### 3.6. Procedures

The experiment started by asking the participants to complete a questionnaire measuring their disposition to trust and demographic information. Participants then received the first part of the vignette, describing the backgrounds of the three characters, the nature of the project, and the communication environment. Participants were then randomly assigned to one of the treatments. Participants in both treatments were informed that they would read an e-mail transcript and then do a questionnaire, which would "ask you some questions about your reaction to what happened." Participants in the PEBC treatment received additional information about the nature of the performance report they would be asked to complete; participants in the no-PEBC treatment received no additional information. The participants then read the part of the vignette depicting communications among

**Table 1** Descriptive Statistics and Correlations for Continuous Variables

Variable	Mean	Standard deviation	Correlations		
			Disposition to trust	Trust in character 1	Trust in character 2
Disposition to trust	4.42	0.69			
Trust in character 1	3.70	0.93	0.130*		
Trust in character 2	5.00	1.25	0.058	0.150**	
Trust in character 3	4.08	1.03	0.193**	-0.084	0.258**

\* $p < 0.05$ , \*\* $p < 0.01$ .

the three characters (either with fulfilling behavior or renegeing behavior). Next, participants in the PEBC treatment completed the PEBC performance evaluation and then received the questionnaire asking them their trust belief in each of the three characters, their overall group-level trust belief and the group effectiveness. Participants in the no-PEBC treatment received the questionnaire first and the performance report second so that it would not influence their trust beliefs (we used part of the performance report as a manipulation check, so all participants completed it). Participants were then debriefed and released.

#### 4. Results

Because there was one set of three dependent variables (trust belief in characters 1, 2, and 3), we used a repeated measures GLM, with disposition to trust, behavior, and PEBC as independent variables. The analysis found no significant differences for any of the seven within-subjects effects,<sup>3</sup> meaning that that the subjects perceived no meaningful differences among the three characters. Therefore, our analysis focuses on the between-subjects effects that test our hypotheses.

Table 1 presents descriptive statistics (original scales) and correlations (after standardization) for the four continuous variables; the two categorical manipulations are omitted. Table 2 presents the statistical results. Table 3 presents the estimated marginal means for trust belief (reported as z-score). There were significant main effects for disposition to trust ( $F(3,310) = 13.06, p = 0.000$ ); as disposition to trust increased, so did trust belief. There were significant main effects for behavior ( $F(3,310) = 5.91, p = 0.016$ ); fulfilling behavior increased trust belief.

<sup>3</sup> The results were: Character:  $F(1,310) = 0.29, p = 0.591$ ; Character  $\times$  PEBC:  $F(1,310) = 1.32, p = 0.252$ ; Character  $\times$  Behavior:  $F(1,310) = 0.27, p = 0.635$ ; Character  $\times$  Trust Disposition:  $F(1,310) = 0.31, p = 0.576$ ; Character  $\times$  PEBC  $\times$  Behavior:  $F(1,310) = 0.39, p = 0.5341$ ; Character  $\times$  PEBC  $\times$  Trust Disposition:  $F(1,310) = 1.10, p = 0.294$ ; Character  $\times$  Behavior  $\times$  Trust Disposition:  $F(1,310) = 0.00, p = 0.988$ .

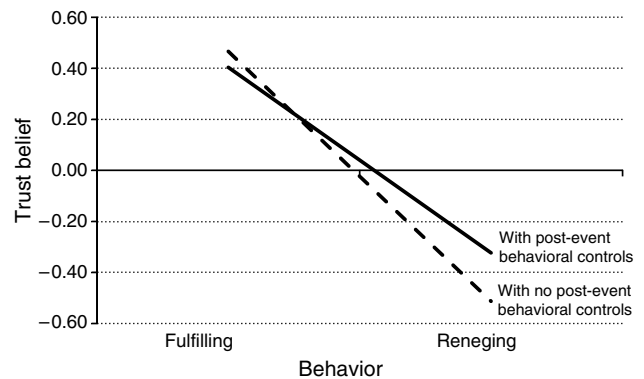
**Table 2** Repeated Measures GLM Results for Trust Belief

Factor	<i>F</i>	<i>p</i>
Disposition to trust	13.06	0.001
Behavior	5.91	0.016
Postevent behavioral controls	5.46	0.020
Postevent behavioral controls $\times$ Behavior	5.96	0.015
Postevent behavioral controls $\times$ Disposition to trust	6.53	0.011
Disposition to trust $\times$ Behavior	0.01	0.944

**Table 3** Estimated Marginal Means for Trust Belief

Behavior	Postevent behavioral controls	No postevent behavioral controls
Fulfilling	0.403	0.466
Reneging	-0.323	-0.513

**Figure 2** Interaction Between Behavior and Postevent Behavioral Controls for Trust Belief



There was a significant interaction effect for PEBC by behavior ( $F(3,310) = 5.96, p = 0.015$ ). The estimated marginal means in Table 3 (as plotted in Figure 2) show that, counter to our hypothesis, the use of PEBC led to *less extreme* trust belief. Participants using PEBC had lower trust beliefs in characters with fulfilling behavior and higher trust beliefs in characters with renegeing behavior than those without PEBC. H1 is not supported.

There was a significant interaction effect for PEBC by disposition to trust ( $F(3,310) = 6.53, p = 0.011$ ). The mean beta coefficient on disposition to trust for the PEBC treatments was 0.231 versus 0.090 for the no-PEBC treatments. As hypothesized in H2, the impact of disposition to trust on trust belief was stronger in the presence of PEBC. As an aside, we note that counter to past research, trust was significantly *higher* in the presence of PEBC ( $F(3,310) = 5.46, p = 0.020$ ), although this cannot be interpreted in the presence of the two significant interaction terms.

#### 5. Discussion

We found that disposition to trust and behavior directly affected trust belief, which matches prior



research. H1 and H2 speak to our primary research question: how do PEBC affect trust belief? We found that PEBC strengthened the impact of disposition to trust on trust beliefs. The use of PEBC encouraged participants to see the behavior they were *predisposed to see* by amplifying their selective perception bias. Individuals who were predisposed to higher trust perceived behaviors as more trustworthy in the presence of PEBC, while individuals who were predisposed to lower trust perceived *those same behaviors* as less trustworthy in the presence of PEBC. This impact has not been considered in prior research and is not a “good” outcome. It suggests that PEBC help to anchor individuals on their a priori dispositions to trust and make them less willing to move from their default trust presumptions, even in the face of behavior that runs counter to them.

We hypothesized that PEBC would make behavior—both fulfilling behavior and renegeing behavior—more salient. We had no direct measures of salience, but we included a check for these arguments. The postevent performance report asked participants to identify which character contributed the most to the project (e.g., fulfilling behaviors) and which contributed the least (e.g., renegeing behaviors) and to explain their reasons for choosing those characters. If PEBC increased salience, then we would expect participants in the PEBC treatments to report more reasons for their choices. One rater coded and counted the number of distinct reasons listed by all participants for both questions. A second rater counted the number of reasons given by a randomly selected subset of 70 participants (about a quarter of the sample); the Cronbach’s alphas for fulfilling reasons (0.89) and renegeing reasons (0.95) indicated adequate interrater agreement. We summed the two types of reasons and ran a GLM analysis, which found that those in the PEBC treatment reported more reasons than did those in the no PEBC treatment (means = 3.23 vs. 2.92,  $F(1,312) = 7.44$ ,  $p = 0.011$ ). Because those in the PEBC treatments reported more reasons for their trust belief, we conclude that PEBC did indeed make behavior more salient. However, the effect of this on trust was the opposite of what we predicted. Rather than making trust beliefs more extreme—higher for individuals exposed to fulfilling behaviors and lower for individuals exposed to renegeing behaviors—the impact was the opposite: use of PEBC tended to soften the extreme views.

Past research offers some insight into these results. Formal controls can increase an individual’s motivation to monitor and evaluate others in a more systematic fashion (Henderson and Lee 1992; Kirsch 1997, 2004; Ouchi 1977). The PEBC used in this study included an open-ended narrative justification of the

evaluation. Narrative justifications, in contrast to simple rating scales, lead individuals to be more attentive to the circumstances surrounding the behavior (Darling et al. 2005, Johnston and Dark 1986) and to empathize more with the team members being evaluated (Charon 2001). We believe the PEBC might have led individuals in the PEBC groups to pay more attention to the acts of both renegeing and fulfilling as well as the context in which the behavior occurred. These individuals might have noticed not only whether a task was completed but also *why* it was or was not completed and the difficulties or ease in performing the task. That is, individuals in the PEBC groups might have paid more attention to what issues arose that might have led to the renegeing or fulfilling behaviors thus dampening any extreme positive and negative evaluations. In contrast, subjects in the non-PEBC groups might have focused only on (and been able to recall) whether or not a task was completed, without considering the context within which the behavior occurred. This could explain why individuals in the PEBC group recalled more behaviors while providing less extreme trust scores. More research is needed on that PEBC that do not use narrative justifications (e.g., those with just rating scales) to understand if they have the same effects; it could be that PEBC without narrative justifications do not encourage an increased focus on the context of the behavior and thus have different effects.

At first glance it would appear that the results of this study are not consistent with that of Piccoli and Ives (2003), which focused on virtual teams with low trust and found that PEBC increased, rather than dampened, the impact of renegeing behaviors. However, there are similarities in the findings between the two studies despite their different methodologies (case study versus lab study). We both found that PEBC increased the salience of renegeing behaviors and this behavior was associated with lower trust within teams. We also found the same effect for fulfilling behaviors as well. However, one important difference is that our PEBC also included a formal evaluation and narrative justification of each individual team members’ behavior. It might be that requiring participants to provide justification along with their evaluations caused our participants to consider the conditions surrounding the fulfilling and renegeing behavior (Charon 2001, Darling et al. 2005, Johnston and Dark 1986). In short, the justifications might have tempered the impact of behavior on trust when PEBC were used.

Our results also show that PEBC strengthen the fundamental relationship between disposition to trust and trust beliefs. We argued that disposition to trust would influence the behaviors that were noticed and

how they were interpreted (those with low trust dispositions would be more likely to see renegeing behaviors and those with high trust dispositions would be more likely to see fulfilling behaviors). We split the participants into two categories based on their disposition to trust (those below the mean, and those above the mean). We used a repeated measures GLM to see if the number of fulfilling reasons and number of renegeing reasons differed by these two categories. As expected, we found no main effect for trust disposition category ( $F(1,312) = 1.06, p = 0.303$ ) because the effects for fulfilling reasons and renegeing reasons should be in opposite directions. However, the expected trust disposition category by type of reason interaction was not significant ( $F(1,312) = 0.09, p = 0.761$ ). Therefore, we speculate that trust disposition had a greater influence on how behavior was interpreted than on whether a behavior was noticed or not.

In summary, we conclude that PEBC might increase or decrease trust beliefs based on behaviors and the observer's disposition to trust. In this study, we used vignettes to tightly control and separate the impact of behavior, PEBC, and disposition to trust on trust beliefs. Prior studies have not employed such strict control and thus some of the differences between our study and prior studies could lie in the disentanglement of these separate, and at times countervailing, forces.

### 5.1. Limitations

This study, like all studies, has its limitations. We used a vignette, a story that was evaluated by our participants. The advantage of this is that we were able to manipulate behavior separately from the manipulation of PEBC, which would have been almost impossible in a traditional team study. However, participants might respond differently when presented with a hypothetical situation in a vignette rather than a real setting in the field (Greenberg and Eskew 1993). Vignettes are also a more subtle treatment and might not be strong enough to induce the thoughts and behaviors in study participants, so treatments are more likely to fail in vignette studies, resulting in non-significant results (Hughes and Huby 2002). We found significant effects in this relatively weak environment, which suggests that they are likely to have stronger effects in real-world settings.

### 5.2. Implications for Research

We believe this study has several implications for research. First, we found that PEBC alters the relationship between behavior and trust beliefs. Prior research suggests that PEBC have an indirect negative effect on trust belief in virtual teams by increasing the salience of renegeing behaviors (Piccoli and

Ives 2003). In contrast, we found that controls increase the salience of *all* behaviors—renegeing and fulfilling—and dampened the impact of these behaviors on trust belief. PEBC might have encouraged individuals to focus not only on the renegeing and fulfilling behaviors themselves but also on the circumstances that surrounded them. This had the effect of reducing the impact of renegeing and fulfilling behaviors on trust belief. Thus the impact of PEBC is more complex than prior research suggests. Understanding when, how, and which circumstances and actions impact the relationship between behavior and trust is an important future topic that has not been examined.

Second, we found that PEBC strengthened the impact that an individual's own disposition to trust has on trust beliefs. This impact might be more pronounced in virtual teams than in face-to-face teams because the use of lean text to form judgments about behaviors may increase an individual's use of their disposition to trust as a filter or interpretive lens on their teammate's behavior. This impact is also likely to be strongest in newly formed teams, as the influence of disposition to trust declines as more information is learned about an individual's behavior (Mayer et al. 1995, Robert et al. 2009). A better understanding of how and why PEBC interact with disposition to trust in both face-to-face and virtual teams will enable us to develop new interventions to reduce this bias and more quickly move individuals beyond their dispositions to focusing on behavior. To accomplish this, more theoretical development and empirical research is needed in both face-to-face and virtual teams.

Third, we found that PEBC impacts trust beliefs through these two distinct and sometimes countervailing paths (behavior and disposition to trust). Thus trust belief lies both in the behavior of the individual and in the eye of the beholder. Past research has not yielded a consistent pattern of theoretical or empirical conclusions about the relationship between controls and trust beliefs (Bijlsma-Frankema and Costa 2005, Coletti et al. 2005, Emsley and Kidon 2007, Zaheer and Venkatraman 1995). We believe that our research offers some insight as to why past research is inconsistent: controls (at least PEBC) influence trust belief through two separate paths that at times produce countervailing forces. Future research needs to consider the separate impacts of PEBC on both paths.

Fourth, our focus was on only one type of control: PEBC using a narrative justification. PEBC can be implemented in several ways. We believe that our results were influenced by the use of narrative justifications which highlighted both the behavior and its context. PEBC that do not include narrative justifications might highlight only the behavior and thus potentially have different effects—but this is an issue for future research. Likewise, there are many other

types of controls (Kirsch 2004, Ouchi 1977). Future research also should examine whether other types of controls (e.g., pre-event behavioral controls, output controls) moderate the relationship between behavior and trust beliefs and between disposition to trust and trust beliefs. To the extent that these other types of controls also encourage increased monitoring and evaluation leading to increased salience of behavior and its context, we might expect similar results. However, this too is an issue for future research.

Finally, we found that individual differences (disposition to trust) had a significant and predictable effect on trust beliefs. Much research on virtual teams has used a social psychology perspective. For example, prior research on trust beliefs in virtual teams has focused on how trust belief is either impacted or impacts team dynamics and work processes. Since Huber's (1983) original indictment of cognitive style research, we have seen empirical research on individual differences wither away (Devaraj et al. 2008, McElroy et al. 2007). Perhaps now is the time to modify our own research paradigms and to begin anew to investigate and understand the role of individual differences in virtual teams. We believe that an important implication for future research is the need for more research on the *cognitive* foundations of individual behavior in virtual teams (cf. Heninger et al. 2006, Nagasundaram and Dennis 1993). We believe this could be useful in designing and implementing better tools and work processes for virtual teams.

### 5.3. Implications for Practice

We believe this study has several implications for managers of virtual teams. Our results show that even a very short and simple postevent evaluation of team members can have a significant impact by inducing individuals to focus more on others' behaviors in forming their trust beliefs. Trust beliefs based on behavior are likely to be more accurate than those based on an individual's characteristics (e.g., gender, race, occupation). Because trust is particularly important in virtual teams, we believe that managers should implement PEBC to encourage virtual team members to form more accurate trust beliefs.

However, our results also show that the use of PEBC is also likely to increase the impact of an individual's own disposition to trust on trust beliefs due to the selective perception bias. It might be possible to reduce the effect that PEBC have in strengthening the selective perception bias through work process interventions. Kray and Galinsky (2003) show that simple procedures can be introduced into teamwork that induces counterfactual information search and processing—the search for and use of information that disconfirms a team member's initial beliefs about a situation. By introducing these counterfactual priming procedures along with PEBC, managers might be

able to use such controls without increasing the negative impact of selective perception bias that PEBC can induce (Gawronski et al. 2008).

One problem with using PEBC in virtual teams is the lack of mutual knowledge (Cramton 2001). In virtual teams, members often lack information regarding the current status of other team members. Unfortunately, virtual team members often assume the worst in the absence of information (Cramton 2001). If the information they do receive is an act of renegeing, this could compound the negative effect on trust. However, collaboration systems can be designed to provide "awareness displays" that provide real time "contextual information" about the current workload of other team members (Dabbish and Kraut 2008). These awareness displays can help teams in two ways: (1) determine if a team member is too busy to fulfill his/her obligations at this time and shift the duties to some else; (2) help team members understand why that teammate failed to live up to the obligation, reducing the negative impact on trust.

### Electronic Companion

An electronic companion to this paper is available as part of the online version at <http://dx.doi.org/10.1287/isre.1110.0364>.

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