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Gert-Jan de Vreede

University of Nebraska at Omaha, gdevreede@usf.edu

Bruce A. Reinig

San Diego State University, breinig@mail.sdsu.edu

Robert O. Briggs

University of Nebraska at Omaha, rbriggs@mail.unomaha.edu

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Recommended Citation

Vreede, Gert-Jan de; Reinig, Bruce A.; and Briggs, Robert O., "e-Collaboration Satisfaction: Empirical Field Studies of Disconfirmation Theory Across Two Cultures" (2008). *AMCIS 2008 Proceedings*. 298.

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e-Collaboration Satisfaction: Empirical Field Studies of Disconfirmation Theory Across Two Cultures

Gert-Jan de Vreede

Institute for Collaboration Science
University of Nebraska at Omaha
Delft University of Technology
gdevreede@mail.unomaha.edu

Bruce A. Reinig

Information & Decision Systems
San Diego State University
breinig@mail.sdsu.edu

Robert O. Briggs

Institute for Collaboration Science
University of Nebraska at Omaha
rbriggs@mail.unomaha.edu

ABSTRACT

Research has shown that although e-collaboration technologies can improve productivity, users will abandon these technologies if they feel dissatisfied after using them. Successful implementation of e-collaboration technologies can be especially challenging with cross-cultural teams, which often bring different values and expectations to their collaboration experiences. We seek to further understand the e-collaboration satisfaction phenomenon through disconfirmation theory. A disconfirmation model of e-collaboration satisfaction is tested with field studies in two cultures (the Netherlands and United States) which differ substantially on the cultural dimension of masculinity. Participants included 254 knowledge workers from the Netherlands and 259 knowledge workers from the United States. The disconfirmation model was supported in both cultures. Participants who reported positive disconfirmation with respect to a collaboration session scored significantly higher on a satisfaction scale than participants who reported negative disconfirmation. Implications for practitioners are discussed.

Keywords

e-collaboration, satisfaction, disconfirmation theory, masculinity, national culture

INTRODUCTION

With the rise of the global economy, many organizations now depend on cross-cultural teams to perform mission-critical tasks. A great deal of research shows that, under certain circumstances, teams using e-collaboration technologies can be more productive than when they do not (e.g. Dennis, et al, 1991; Fjermestad & Hiltz, 1999, 2001). However, the availability of well-crafted e-collaboration tools is by no means a guarantee of successful adoption and sustained use. Social cues and social structures differ from culture to culture. People in different cultures ascribe different meanings to the words and actions of others. Perceptions of time differ across cultures, as do the goals people hold and the value they ascribe to attaining their goals. If team members lack intercultural fluency, cultural differences can impede productivity when norms and expectations differ substantially among team members (Beranek, Broder, Reinig, Romano, & Sump, 2005). This can give rise to feelings of dissatisfaction with the e-collaboration experience.

It is particularly important that e-collaboration researchers, users, and service providers develop a sound understanding of satisfaction and dissatisfaction phenomena because studies show that people who find their initial experiences with an information technology dissatisfying tend not to use it in the future (e.g. Bailey & Pearson 1983; Baroudi, Ives, & Olson 1983). Further, initial satisfaction with a system does not guarantee continued satisfaction (e.g. Khalifa and Liu, 2003) or sustained use (e.g. Reinig et al., 1996). People who feel dissatisfied while using a system, even for non-technical reasons, may discontinue its use (Bhattacharjee, 2001; Te'eni and Feldman, 2001). These insights have

particular bearing on cross-cultural teams using e-collaboration. If cultural differences impede e-collaboration productivity, giving rise to dissatisfaction, teams may discontinue using collaboration technologies from which they derive considerable value.

It is therefore essential that leaders and managers of e-collaboration users understand the mechanisms of the satisfaction response so they can lead their teams through successful, productive, and satisfying e-collaboration activities. It is also important that e-collaboration service providers understand satisfaction because dissatisfied users can easily switch to different providers. It would therefore be useful for e-collaboration researchers to develop a sound body of empirically tested theory to explain observed variations in e-collaboration satisfaction. This paper seeks to contribute to that understanding using a disconfirmation theory of satisfaction. Disconfirmation theory proposes that satisfaction is a function of the degree to which realized outcomes differ from expectations and/or desires. This paper presents a measurement scale for disconfirmation, and uses the scale to test the disconfirmation theory of satisfaction in two national cultures among 513 experienced knowledge workers using e-collaboration technologies to address real problems in their organizations.

In Section 2, we discuss the nature of culture and the logic behind the selection of two countries for empirical studies of e-collaboration satisfaction. In Section 3, we discuss disconfirmation theory. We compare it with other perspectives, and use it to derive hypotheses for e-collaboration satisfaction. In Section 4, we present our research design, including the derivation of the disconfirmation scale. In Section 5, we present a statistical analysis of our findings. In Section 6, we discuss the implications of our findings for practitioners and researchers. We also discuss the limitations of the current study and directions for future research. In Section 7, we present our conclusions.

CULTURE AND THE SELECTION OF TWO COUNTRIES FOR FIELD STUDIES

Hofstede (1991) defines culture as "...the collective programming of the mind which distinguishes the members of one group or category of people from another. (p. 5)" Culture is a learned phenomenon that is shared among people within the same social environment (Hofstede, 1991). Hofstede (1991) defines five dimensions of culture to distinguish their differences – power distance, individualism, masculinity, uncertainty avoidance, and long-term orientation.

Hofstede posits that cultural differences along the masculinity dimension would be particularly likely to manifest during meetings (Hofstede, 1991). The masculinity dimension refers to the degree to which roles are distributed across genders. Masculinity "pertains to societies in which social gender roles are clearly distinct ..." while its opposite, femininity "pertains to societies in which social gender roles overlap..." (Hofstede, 1991, p.82-83). Hofstede (1991) summarizes these differences by stating that, in masculine cultures, conflicts are resolved by a "good fight" and in feminine cultures conflicts are more likely to be resolved by "compromise and negotiation."

To illustrate differences along the masculinity dimension of culture, Hofstede (1991) contrasts the United States, which lies near the masculine end of the continuum with the Netherlands, which lies near the feminine end of the continuum. He reports that people in Dutch meetings are more focused on seeking common solutions, while people in U.S. meetings are more focused on asserting themselves and demonstrating their expertise. Because such differences could impede group productivity, giving rise to dissatisfaction, the masculinity dimension is of particular importance to e-collaboration research.

Because the Netherlands and the U.S. differ widely on the masculinity dimension, and because the masculinity dimension manifests strongly in meetings, these two countries were strong candidates for studies of satisfaction with e-collaboration processes and outcomes. It was possible to gain access to groups in both countries who were working on real-life problems, and that were using the same e-collaboration technology. We therefore elected to examine the theoretical relationship between disconfirmation and satisfaction among teams using e-collaboration both in the U.S. and the Netherlands.

DISCONFIRMATION THEORY OF SATISFATION AND E-COLLABORATION

We define the *satisfaction response* as a valenced affective response with respect to some object. Researchers have taken several approaches to understanding the satisfaction response. Some propose goal-attainment models, positing that satisfaction responses arise in response to judgments that goals have been attained or thwarted. Several studies of e-collaboration report empirical support for goal attainment effects (e.g., Reinig, 2003; Briggs et al., 2006). Goal attainment models, however, cannot account for asymmetrical hygiene effects, where people feel no satisfaction when goals are attained, but dissatisfaction when goals are thwarted (Hertzberg 2003).

Building on Locke's (1969) and Locke and Latham's (1990) goal-setting theory, which posits that the mind automatically and subconsciously evaluates actions, objects, and events to determine whether individual goals are being advanced or thwarted, Reinig, Briggs, and Vreede proposed satisfaction as a function of perceived changes-in-likelihood-of-goal-attainment (LGA) (Reinig, Briggs, & Vreede, 2008). The LGA approach offers a possible explanation for hygiene

effects – when people expect to attain goals, they experience no LGA, and so feel no satisfaction when goals are attained. However, when people expect to attain goals, but do not, they experience a negative LGA, and so feel dissatisfied. The LGA approach, however, cannot account for differences of satisfaction based on the degree of value people ascribe to their goals (Reinig et al., 2008).

Disconfirmation theories of satisfaction (Oliver, 1996) propose that satisfaction is a function of disconfirmations of desires and expectations. Disconfirmation is defined as the degree to which realized outcomes *differ* from expectations and/or desires (e.g., McKinney, Yoon, & Zahedi, 2002; Susarla, Barua, and Whinston, 2003). Expectations relate to the value one judges oneself likely to derive from an outcome, while desires relate to the ideal value one wishes to derive from the outcome. Disconfirmation theory predicts that if the difference between an outcome and initial expectations (or desires) is positive (i.e., the outcome is better than expectations), an individual will feel satisfied; if the difference is negative, he or she will feel dissatisfied, and if outcomes exactly match expectations or desires, then neither satisfaction nor dissatisfaction should manifest. Thus, a disconfirmation theory can account for situations when outcomes do not just achieve goals, but exceed them. In such cases satisfaction will manifest. It can also account for asymmetrical hygiene effects – if individuals expect to attain and do attain goals, then no disconfirmation manifest, so no satisfaction manifests, but if individuals expect to attain, but do not attain goals, negative disconfirmation manifests, causing dissatisfaction.

Chin and Lee (2000) add nuance to disconfirmation theory by demonstrating that disconfirmation-of-desire actually moderates the relationship between disconfirmation-of-expectation and satisfaction, such that disconfirmations of expectation produce larger satisfaction effects when goals are more desired than when goals are less desired. This would account for differences of satisfaction based on the degree of value people ascribe to their goals. Thus, a disconfirmation theory may account for more of the observed variations in satisfaction than goal attainment models of satisfaction.

If the logic of disconfirmation theory holds, then the effects it predicts should hold across cultures, even those that differ along one or more of Hofstede's dimensions of culture. The cognitive mechanisms assumed by the theory would be inherent in human physiology, and so unchanged by culture. The inputs to these mechanisms, however, could indeed differ by culture. Goals, the value of goals, expectations, desires, and the interpretation of words, actions, and events would be likely to differ between culturally disparate groups. Thus, in the same circumstance, e-collaboration users from different cultures might start with different values for causal constructs, and so experience different levels of satisfaction. The theoretical relationship between disconfirmation and satisfaction should, however, be constant, even as inputs and outputs differ. To test the disconfirmation proposition, we derive the following hypotheses with respect to satisfaction in e-collaboration sessions:

H1: Participants in an e-collaboration session who report positive disconfirmation with respect to the session will report greater satisfaction with process than individuals who report negative disconfirmation with respect to the session.

H2: Participants in an e-collaboration session who report positive disconfirmation with respect to the session will report greater satisfaction with outcome than individuals who report negative disconfirmation with respect to the session.

To test these hypotheses, and to test whether the logic of disconfirmation theory would hold across cultures, we derived a disconfirmation scale that measures the magnitude and direction of disconfirmation among e-collaboration participants, and used it to test disconfirmation theory in two different cultures that differ on the masculinity dimension - the US and the Netherlands. The next section explains the research methods for those studies.

RESEARCH METHODS

Participants

We conducted two studies among experienced knowledge workers using e-collaboration to solve real problems in their organizations. The Dutch study included 254 participants in 19 groups. The average age of the Dutch participants was 40.5 years ($s=10.9$) and their average work experience was 16.9 years ($s=10.5$). The U.S. study included 259 participants in 22 groups. The average age of the US participants was 39.8 years ($s=13.2$) and their average work experience was 18.3 years ($s=12.6$). All groups were convened by their business, government, or non-profit organizations to work on tasks assigned to them by their employers as a part of their normal workload. No groups were convened by researchers to serve as research subjects for this study.

Tasks

All work groups used e-collaboration to address complex organizational problems. Each received support from a professional facilitator, and each used a Group Support System to support their collaboration efforts. Both US and Dutch tasks involved topics such as strategy making, organizational restructuring, curriculum development, human resource program development, and event organization. Some US sessions focused on information system development and some Dutch sessions focused on product development and scenario planning.

Independent Variable

In order to measure disconfirmation in an e-collaboration setting we derived a four-item disconfirmation scale. Each item used a seven-point semantic anchor with 1 equal to “much less” and 7 equal to “much more.” The English version appears here:

Meeting Disconfirmation Scale

1. I got (less/more) from the meeting than I had anticipated.
2. I benefited (less/more) from this meeting than I expected.
3. The meeting did (less/more) good for me than I thought it would.
4. I gained (less/more) from the meeting than I believed I would.

Each of the four questions enquires about a disconfirmation experience. The seven-point scale allows for a neutral response, which is consistent with the nature of the disconfirmation construct. We elected to use the general term “meeting” rather than the more-specific term, “e-collaboration session,” so that, in the future, having validated the instrument, we could use the exact same wording to compare disconfirmation experiences among groups that were using e-collaboration technology to the experiences of groups that were not.

Dependent Variable

To measure Satisfaction with Process (SP) and Satisfaction with Outcome (SO) we used the items published by Briggs, Vreede, and Reinig (2003). To verify the equivalence of the instruments, we had both English and Dutch versions reverse-translated by native speakers of both languages. The results were deemed to be equivalent by speakers of both languages. The Dutch language items (Briggs et al., 2006; Reinig et al., 2008) and English language items (Reinig et al., 2008) had been previously validated. We conducted statistical analysis using this data set, and confirmed the inter-item reliability and convergent and discriminant validity of SO and SP questions in both languages. SO and SP items used a seven-point Likert scale. The English version appears here:

Satisfaction with Process Scale

1. I feel satisfied with the way in which today's meeting was conducted.
2. I feel good about today's meeting process.
3. I liked the way the meeting progressed today.
4. I feel satisfied with the procedures used in today's meeting.
5. I feel satisfied about the way we carried out the activities in today's meeting.

Satisfaction with Outcome Scale

1. I liked the outcome of the meeting.
2. I feel satisfied with the things we achieved in the meeting.
3. When the meeting was over, I felt satisfied with the results.
4. Our accomplishments in the meeting give me a feeling of satisfaction.
5. I am happy with the results of the meeting.

We designed the instrument to be short so that it could be used quickly and easily among working professionals in the field. Prior experience showed that real organizational teams are less willing to complete lengthy questionnaires than are student participants in lab studies. As demonstrated in the results section below, the four disconfirmation items had sufficient discriminant and convergent validity.

Investigative Procedures

All groups involved in this study approached professional facilitators to request facilitation services for their group to help the group work on a real problem in their organization. The facilitators completed pre-meeting planning with all meeting owners. At the end of pre-meeting planning, the facilitator requested permission to administer a one-page

satisfaction questionnaire at the end of the session. All meeting owners agreed to allow the questionnaire. At the end of each work session, facilitators asked group members if they would be willing to spend two minutes answering the questionnaire. Facilitators stressed that participation was optional. More than 99% of participants opted to fill out the questionnaire.

ANALYSIS AND RESULTS

The instrument was first tested for reliability and construct validity. The validation included the 14 items. Five items were used to measure satisfaction with outcome (SO) and five items were used to measure satisfaction with process (SP). Four items were used to measure disconfirmation. Principle components analysis was used to validate both the English and Dutch versions of the instrument. In each case the results suggested a three factor model in which items intended to measure the same construct loaded heaviest on a single, shared factor, demonstrating convergent validity (Tables 1 & 2). Further, items tended to not load heavily on multiple constructs, indicating divergent validity. The Cronbach's α measure ranged from .854 to .937 for the Netherlands data and from .950 to .971 for the U.S. data, indicating acceptable inter-item reliability. Thus, there was sufficient evidence to conclude that the instruments were valid and appropriate for use in hypothesis testing.

Table 1a. Principle Components Analysis and Cronbach's α Using Data from the Netherlands

Item	Factor 1	Factor 2	Factor 3	Cronbach's α
DIS1	.283	.258	.752	.854
DIS2	.215	.194	.821	
DIS3	.184	.216	.763	
DIS4	.271	.201	.748	
SP1	.231	.763	.365	.888
SP2	.364	.631	.469	
SP3	.139	.746	.202	
SP4	.345	.769	.149	
SP5	.307	.789	.160	
SO1	.811	.190	.212	.937
SO2	.833	.277	.221	
SO3	.821	.289	.293	
SO4	.813	.305	.286	
SO5	.812	.252	.237	

Note: Principle components analysis used varimax rotation. Disconfirmation Items (DIS) are DIS1 to DIS4, satisfaction with meeting process (SP) items are SP1 to SP5, and satisfaction with meeting outcome (SO) items are SO1 to SO5. Boldface indicates the heaviest factor loading for an item.

Computing Independent & Dependent Variables

The independent variable in this study is disconfirmation of expectations, which can manifest in one of three states: positive disconfirmation, negative disconfirmation, and neutral. Positive disconfirmation would be said to exist if an individual perceived greater value resulting from the e-collaboration effort than he or she expected to receive from it. Negative disconfirmation would be said to exist if an individual perceived less value resulting from the e-collaboration effort than he or she expected. Finally, a neutral state would be said to exist if an individual perceived approximately the value expected from the e-collaboration effort (i.e., the value from the meeting matched his or her expectation).

The hypotheses were tested by conducting separate one-way ANOVAs comparing the sample means for SO and SP across the three levels of disconfirmation within each of two cultures. To establish the independent variable for the ANOVA, test, participant responses to the four disconfirmation items were categorized as representing one of the three disconfirmation states following the process outlined in Figure 1. First, the mean value was computed for the four items. Second, four was subtracted from the mean so that zero represented the neutral response. Third, the score from step 2 was classified as neutral, positive, or negative. If a score from step 2 ranged from -25, to .25, the observation was classified as neutral. Thus, a response to the four item measure that what was predominantly neutral, such as {4, 4, 4, 3} (mean response = $3.75 - 4.00 = -.25$) or {4,

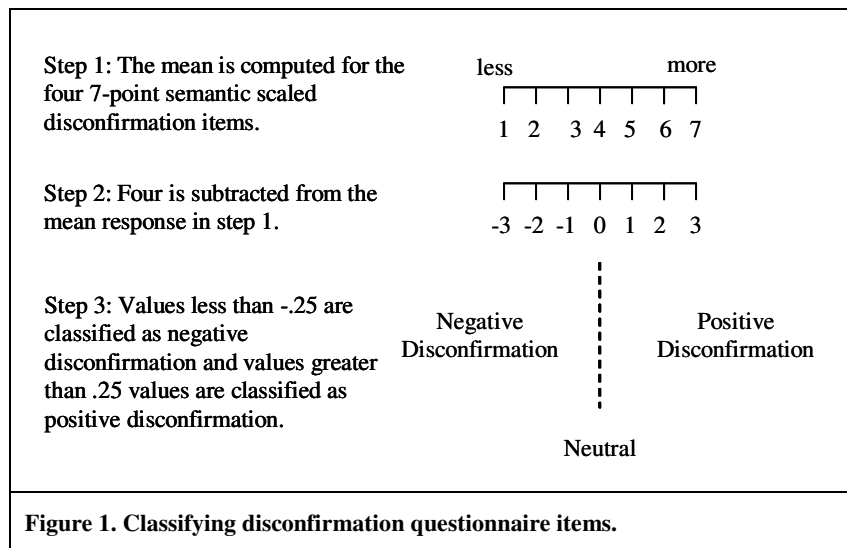
4, 4, 5} (mean response = 4.25 – 4.00 = .25), was classified as neutral. If a score from step 2 was greater than .25, the observation was classified as positive disconfirmation and if it was less than -.25, the observation was classified as negative disconfirmation. The distribution of participants across the three disconfirmation categories (i.e., positive, neutral, and negative) are reported in Table 3.

Table 1b. Principle Components Analysis and Cronbach’s α Using Data from the United States

Item	Factor 1	Factor 2	Factor 3	Cronbach’s α
DIS1	.294	.363	.802	.959
DIS2	.312	.371	.820	
DIS3	.298	.352	.821	
DIS4	.324	.318	.829	
SP1	.830	.330	.270	.950
SP2	.701	.345	.420	
SP3	.786	.338	.333	
SP4	.843	.271	.269	
SP5	.828	.384	.234	
SO1	.433	.770	.332	.971
SO2	.415	.779	.366	
SO3	.325	.809	.378	
SO4	.356	.793	.396	
SO5	.356	.797	.380	

Note: Principle components analysis used varimax rotation. Disconfirmation Items (DIS) are DIS1 to DIS4, satisfaction with meeting process (SP) items are SP1 to SP5, and satisfaction with meeting outcome (SO) items are SO1 to SO5. Boldface indicates the heaviest factor loading for an item.

The two dependent variables in the study (i.e., SO and SP) were calculated by first computing the mean value for each set of five items, and then subtracting four from the mean. These items were measured on a 7-point Likert scale that also had a neutral value of four. Thus, a negative satisfaction score could be interpreted as dissatisfaction and a positive satisfaction score could be interpreted as satisfaction. The mean SO and SP score for each disconfirmation category in the U.S. and the Netherlands is reported in Table 3.



In the U.S. sample, 38 respondents were classified as reporting negative disconfirmation, 54 were classified as reporting neutral disconfirmation, and 167 were classified as reporting positive disconfirmation, for a total of 259 responses. In the Netherlands sample, 40 respondents were classified as reporting negative disconfirmation, 74 were classified as reporting neutral disconfirmation, and 140 were classified as reporting positive disconfirmation, for a total of 254 responses.

Hypotheses Results

The ANOVAs comparing the mean SO and SP scores across groups from the U.S. were statistically significant at the $p < .001$ level (Table 3). Tukey tests were conducted to examine pairwise differences within each ANOVA. For the US data, the positive disconfirmation respondents reported significantly higher SO and SP than the neutral disconfirmation respondents. Further, the neutral (and positive) disconfirmation respondents reported significantly higher SO and SP than did the negative disconfirmation respondents (Table 3). Thus, H1 and H2 were both supported for the U.S. data.

The ANOVAs comparing the mean SO and SP scores across these groups from The Netherlands were statistically significant at the $p < .001$ level (Table 3). Tukey tests were conducted to examine pairwise differences within each ANOVA. For the Netherlands data, the positive disconfirmation respondents reported significantly higher SO and SP than the neutral disconfirmation respondents. Further, the neutral (and positive) disconfirmation respondents reported significantly higher SO and SP than did the negative disconfirmation respondents (Table 3). Thus, H1 and H2 were both supported for the Netherlands data.

Table 3. Means, standard deviations, and ANOVA results for satisfaction data by disconfirmation status

Country & Dependent Variable	Negative Disconfirmation	Neutral Disconfirmation	Positive Disconfirmation	ANOVA Results
United States Satisfaction w/ Process	-.20 (1.51) N=38	1.06 (1.10) N=54	1.83 (.78) N=166	F=68.72*** Positive, Neutral > Negative Positive > Neutral
United States Satisfaction w/ Outcome	-.74 (1.27) N=38	.48 (.93) N=54	1.52 (.93) N=165	F=88.36*** Positive, Neutral > Negative Positive > Neutral
The Netherlands Satisfaction w/ Process	-.04 (.86) N=39	.89 (.88) N=74	1.42 (.74) N=143	F=53.18*** Positive, Neutral > Negative Positive > Neutral
The Netherlands Satisfaction w/ Outcome	-.46 (.93) N=40	.26 (.85) N=74	1.05 (1.01) N=142	F=58.04*** Positive, Neutral > Negative Positive > Neutral

Notes: *** $p < 0.001$, all pair-wise comparisons shown are Tukey's tests and significant at $p < 0.05$

DISCUSSION

The hypotheses proposed in this paper, which test the proposition that satisfaction is a function of disconfirmation of expectations, was supported in the domain of e-collaboration. That is, participants who reported that the value derived from an e-collaboration session exceeded their expectations (i.e., positive disconfirmation) reported greater satisfaction with outcomes and processes than did participants who reported that the value derived from an e-collaboration session was less than their expectations (i.e., negative disconfirmation). These hypotheses were supported across two distinct cultures, which are likely to have culturally different expectations with respect to e-collaboration sessions due to differences in the masculinity dimension. The mean values of SO and SP for the three disconfirmation categories across both cultures are depicted in Figures 1 and 2.

It is worth noting that a majority of respondents, 64.5 percent (167/289) of US respondents and 55.1 percent (140/254) of the Dutch respondents, reported a positive disconfirmation of expectations as classified by our instrument. Although these are the first published results with this disconfirmation instrument, and as such benchmarks do not exist, these proportions do seem relatively high given our experience with organizational meetings, which can often be frustrating and

time consuming. One possibility is that the use of a trained facilitator and e-collaboration technologies may each have contributed to the high values perceived from these sessions. It may be of use, therefore, to measure disconfirmation of expectations in various environments to determine what interventions contribute significantly to positive disconfirmation. The distribution of participants in the three disconfirmation categories, however, were not significantly different between the two cultures ($\chi^2=5.50, p=.064$).

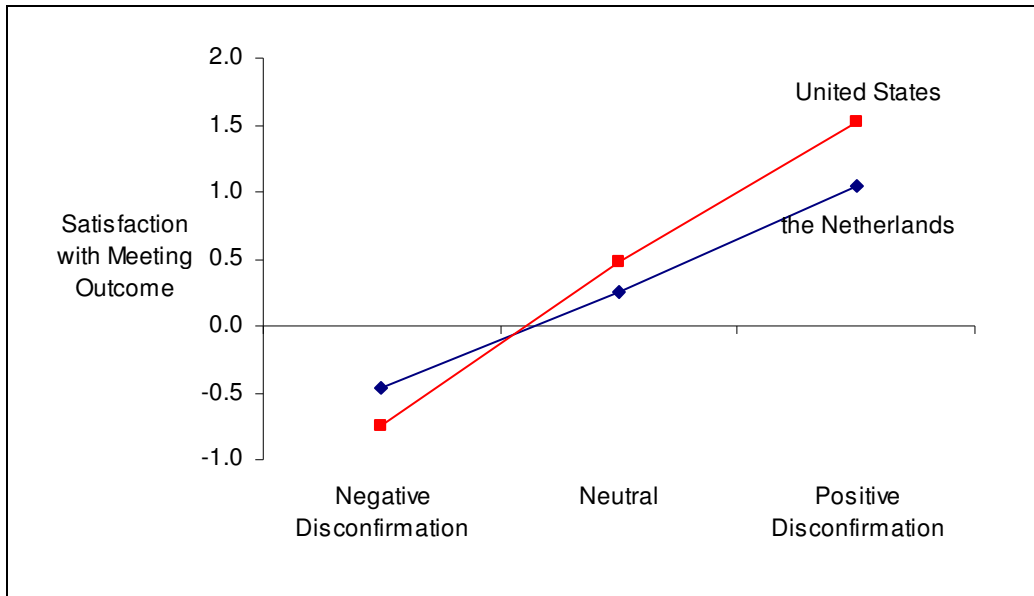


Figure 2. Means plot of Satisfaction with outcome scores by disconfirmation level for the Netherlands and U.S. data

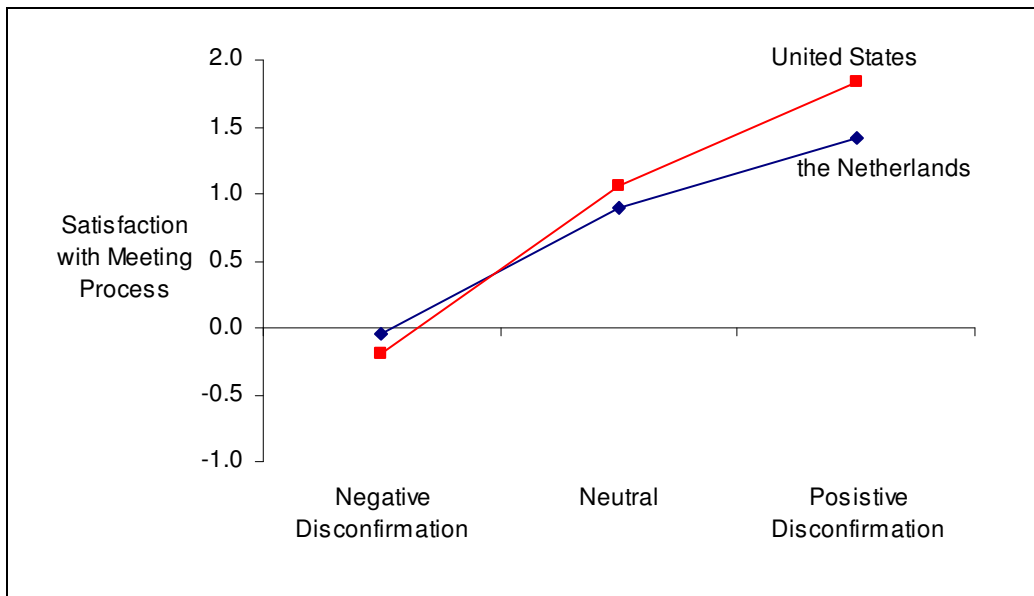


Figure 3. Means plot of Satisfaction with process scores by disconfirmation level for the Netherlands and U.S. data

Implications for Practice

Disconfirmation theory suggests a number of strategies for facilitators and team leaders to foster satisfaction among team members. Prior to meetings, it is useful to elicit expectations and prepare a meeting process that is designed to achieve these expectations. If requirements are not well understood upfront, it is unlikely that e-collaboration will be successful, which may lead to negative disconfirmation and subsequently dissatisfaction. It is useful to explicitly ask participants to state their expectations at the beginning of a meeting and then address those expectations again at the end of the meeting to determine how the results contribute to achieving those expectations. This process will also allow the team leader to recalibrate unrealistic expectations, and thus possibly avoid negative disconfirmation with respect to unrealistically high expectations. Finally, leaders should summarize and otherwise draw attention to the positive results, both tangible and intangible, of a meeting. By focusing on the accomplishments of a collaboration session, leaders may help foster positive disconfirmation among the participants.

Limitations

There are limitations to this study that could reduce the degree to which the results can be generalized. First, only two cultures were examined in the study. Although these cultures were useful for comparing an important cultural dimension, namely masculinity, other cultures could also be examined that would allow testing the theory against dimensions such as power distance, individualism and long-term orientation. Another limitation is inherent to the use of only professional groups, which, contrary to laboratory studies, do not lend themselves to controlling session differences such as task and participant demographics. We accepted this limitation when designing the study because it would be difficult to design a laboratory study in which student subjects had the same stakes in outcomes as employees collaborating in the workplace. Even with this limitation, which could have obscured disconfirmation effects, results were consistent with the theoretical proposition they were meant to test. Despite these aforementioned limitations, the paper provides an important step in applying disconfirmation theory to e-collaboration satisfaction.

CONCLUSION

This paper reported two tests in two different cultures of a disconfirmation theory of satisfaction in the context of e-collaboration sessions conducted by groups using e-collaboration systems to work on real organizational problems in the workplace. The studies re-confirmed validations of multi-item scales to measure satisfaction-with-process (SP) and satisfaction-with-outcomes (SO) in both cultures. The studies also validated a multi-item scale to measure disconfirmation of expectations in a meeting environment. Findings were consistent with the theoretical proposition in both cultures. This evidence adds support to the suggestion that disconfirmation theories may be a useful theoretical explanation for satisfaction responses that manifest at the time outcomes are obtained.

ACKNOWLEDGEMENT

The authors would like to thank the Center for International Business Education and Research (CIBER) at San Diego State University for support of this research project.

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