**Antecedents to Trustworthiness, Satisfaction, and**

**Potency in Ad Hoc Face-To-Face and Computer-Mediated Teams**

**ABSTRACT**

The purpose of this paper was to test a model linking individual perceptions of mood, trust, satisfaction, and potency in face-to-face and virtual reality teams. Results indicate that the model is valid in both conditions but that perceptions of each construct were higher in the face-to-face condition. Mood was found to significantly correlate with perceptions of benevolence, integrity and ability in the virtual reality team condition only. The implications of this research includes an understanding that trust in teams operate similarly in both types of student teams even though perceptions are lower in a leaner medium communication mode. Instructors should be aware that teams may need more support when operating virtually and may benefit from some face-to-face interactions before interacting in a virtual reality team.

**Keywords:**

Computer-mediated teams; virtual teams; team trust; team potency; mood

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Work teams play a fundamental role in the accomplishment of organizations’ goals perhaps more now than ever before. With an increased global presence, and the ability of teams to span a variety of areas - functional, organizational, temporal and geographic – via computer-mediated mediums, organizations are able to access knowledgeable on many levels (Likoebe & Agarwal, 2004). Literature has shown that teams are defined as a group sharing a common objective and working together to achieve that objective. There are many advantages such as better solutions, productivity, and creativity. The purpose of the study is to assess whether the constructs operate similarly between the two conditions (i.e., FTF and virtual ad hoc teams). The particular focus of this research, while applicable to the business environment, is on student teams in an educational setting. Since professors commonly use ad hoc teams, knowing that trust, potency, and satisfaction do not operate the same across the two types of teams can explain why some teams excel, some fail, and some require more time to allow these constructs to develop among members.

High-functioning, productive teams share a common trait of trust among members. Fuller, Marett and Twitchell (2012) noted team development relied on trust and mutuality. Jarvenpaa, Knoll, and Leidner (1998) focused on the benefits of trust in a team. Trust in a team translates to reduced transaction costs, more confidence and security among members, and an open and useful exchange that is useful in achieving the team’s objectives. The perception of skills one possesses is perceived to determine competency or ability. As group members interact, a care and concern for one another develops. Expressing empathy and considering what is best for the group as a whole versus egocentric motives is what is considered benevolence. Another factor influencing the level of trust in a group is integrity. Dependability, reliability, and the ability to adhere to positive and productive work habits increases the level of trust among members. In virtual teams, not having direct interaction and therefore a context in which behaviors take place can be a barrier to team function (Jarvenpaa et al., 1998).

Particularly in computer mediated teams, trust is important because of feelings of uncertainty and risks (Breuer, Huffmeier, & Hertel, 2016). There is a difference between trust where one is willing to be vulnerable and risk-taking which is the behavior that results when trust is present. In virtual teams, there is additional uncertainty because there is less context information and less social control than in face-to-face teams (Breuer et al., 2016).

Relationships, according to Cropanzano and Mitchell (2005) can alter the nature of exchanges and exchanges can alter the relationship. Instructors will find this information helpful in order to assist students operating in a computer-mediated team. Social exchange theory, which discusses relationships and the expectations that occur when an exchange between two or more take place, and attribution theory, in which people prescribe causes for events and behavior, are applicable in this discussion. Connelly and Turel (2016) found most individuals believed they were capable of accessing someone’s emotional authenticity by focusing on the content and tone of the messages online. According to Lawler (2001), in the affect theory of social exchange, participants analyze their emotions and feelings that are produced when interacting successfully and unsuccessfully. The reason participants analyze their emotions and feelings is to create a sense of order and harmony about the relationship whether at the individual, group, or network level. Barsade (2015) found group affect to be an important aspect in shaping group activities and outcomes. Chesin, Rafaeli, and Bos (2011) discussed how individuals watch the behavior of others in order to identify the emotions being felt then react to those moods and behaviors. Lawler also examined how individuals will avoid negative emotions and instead reproduce positive emotions in response to social exchanges. When face-to-face with another, an individual will act positive knowing positivity will be better received and is more acceptable than negativity. In a computer-mediated environment, this is less likely to happen as is shown in this research. Tseng and Ku (2011) said trust improves when there is interaction and positive experiences. They also found the opposite to be true as “miscommunication, different expectations regarding behavior, and presumed negative intentions can quickly destroy trust” (Tseng & Ku, 2011: 82). Lawler (2001) addressed how emotion management keeps emotions hidden from view and are carefully managed by the individual. This again is to maintain positive social exchanges. The question to be examined in the following research is, if trust is important for successful teams, what effect does mood have on trust between team members. In virtual teams, mood seems to impact the team more than in face-to-face interactions. In this study, the effect of mood on the functioning and productivity of team is examined. How instructors can help teams will be discussed later in the Conclusions and Future Direction section.

**LITERATURE REVIEW**

**Aspects of Trust**

Three characteristics appear in literature of which trust is comprised. These factors are ability, benevolence, and integrity. Mayer (1995) noted the parallel to Aristotle’s *Rhetoric* in which ethos is described as being based on one’s intelligence, character and goodwill. Ability, benevolence, and integrity are all important to trust yet may vary independently of one another (Mayer, 1995; Kuo & Thompson, 2014). Mayer also noted that trustworthiness, as well as the antecedents of trust, can vary along a continuum and also be affected by context.

Jarvenpaa, Knoll, and Leidner (1998) found trust becomes essential when self-direction and self-control are needed such as in the absence of supervision in computer mediated teams. Trust “is reported to reduce transaction costs, increase confidence and security in the relationship, and promote open, substantive, and influential information exchange” (Jarvenpaa et.al., 1998: 30). Tseng and Ku (2011) described trust as the bond that keeps a team together and encourages interdependence among team members resulting in productive teamwork.

In a face-to-face context, time is needed for trust to evolve yet in computer mediated teams the context becomes a barrier to developing relationships needed and thereby the trust so important for productive exchanges. Jarvenpaa et. al. (1998) found high trust teams were more focused, had better communication, and were more supportive of one another than low trust teams. Findings from Lowry, Schuetzler, Giboney, and Gregory however were surprising when they found evidence from face-to-face groups that trust can prove detrimental and distrust be instrumental in decision making in groups. Groups were found to construct more optimal solutions when faced with a non-routine/non familiar problem. This carried over to virtual teams that, when “seeded with distrust significantly outperformed all control groups in a non-routine decision-making task” (Lowry, Schuetzler, Giboney, & Gregory, 2015: 1).

**Mood, Emotions, and Feelings**

Acknowledging the importance of trust in both face-to-face and computer mediated teams, the question of what effect mood has on trust between team members is a unique consideration. Chesin, Rafaeli, and Bos (2011) recognized emotions carry social influence. Emotions have a particular social role and humans show emotions when they experience them (Fowler & Christakis, 2008). Emotion contagion defined by Chesin, et. al. is “an unconscious process attributed to mimicking of non-verbal cues” (2011: 2). Moods and emotions are distinct from one another with moods typically lasting longer and being of less intensity than emotions. There is a distinction between emotions and moods with moods not necessarily being derived from a specific cause. In teamwork however this gets blurred. Emotion contagion can affect a team by someone’s emotion spreading and unconsciously shaping others’ mood. Non-verbal cues are primarily the way emotion contagion spreads but in computer mediated teams, these cues are limited. Negative emotion gives way to shorter messages, more negative terms, and slower response via text-based messaging (Chesin et al., 2011). Anticipatory contagion happens when individuals match the mood of someone they have not previously had contact with but with whom they were about to interact. People who are in a positive frame of mind are considered to be more flexible and therefore happy. This positive mood gives social cues that there is psychological safety or interpersonal security to interact with this individual (Liu, Lam, Chen, Jia, & Huang, 2015).

As Totterdell, Kellett, Teuchmann, and Briner (1998) found in their research, people are affected by the moods of those around them. Barsade and Gibson used the term interaction synchrony to mean “the tendency for group members to automatically adjust their behavior to synchronize with other members’ behavior” (2000: 119). This is particularly true if the relationship involves people who are close and have known one another for awhile. Reciprocation of mood can result in a sense of shared similarity in a work team. When the individual’s mood is positive, then the resulting team mood similarly will be positive. Conversely, if the mood is negative the team members will also share that negativity. Totterdell (1998) identified primitive emotional contagion as result of a nonconscious process that results in mood induction. In simple terms, this means people are affected by the mood of others within a group. Kramer, Guillory, and Hancock (2014) however stated contagion resulted not from exposure to an emotion but the interaction experienced even if only textual. Volmer (2012) referenced Affective Events Theory (AET), which suggested both positive and negative occurrences in the workplace can have an effect on feelings, attitudes and performance of employees. Over time, mood exchange may result in mood linkage but that may depend on the relationship. More research is necessary to examine moods and their effect on computer mediated teams.

Online disinhibition effect (Lapidot-Lefler and Barak, 2012) is defined as lessening behavioral inhibitions in the online setting. Negative online disinhibition effect is the result of individuals using aggressive behaviors that would normally not be undertaken in person or face-to-face. Knowing the expression of frustration and anger may be socially inappropriate, most will hold back these emotions face-to-face but they can be shared using linguistic cues online (Guillory, Spiegel, Drislane, Weiss, Donner, & Hancock, 2011). Behaviors such as online flaming or other behaviors that would damage one’s self-image or someone else’s without any personal progression are termed toxic disinhibition. Flaming is using hostile expressions such as textual elements such as hostile language, a mix of letters, numbers and punctuation meaning shouting or derogatory names, or even the use of a red color or bold face to show anger or aggression. There are three factors identified by Lapidot-Lefler and Barak that play a role in online disinhibition. They are anonymity, invisibility, and lack of eye contact.

Anonymity is not just being nameless but being unidentifiable in terms of characteristics such as appearance or personal data. Instead there is an online sense of anonymity, which includes invisibility, lack of eye contact, and non-disclosure of personal data. As further explained by Lapidot-Lefler and Barak (2012), invisibility means, in order to control impression management, having no pictures, video, or any social presence online where one could be recognized. Visual anonymity gives a sense of liberty to clearly show feelings, whether antagonistic or friendly. Eye contact, as shown in many studies, is important for interpersonal communication. Behaviors that generate negative online disinhibition can be induced by the lack of eye contact. Even with the use of devices that allow visibility such as a webcam, not enough information is gained as would be garnered from direct eye contact. Eye contact plays a significant role in controlling interpersonal communication and social regulation and without it disinhibition is the outcome. The style of discussion, ways of seeking information, learning online, relationships, and group behavior are all significantly affected by disinhibition (Lapidot-Lefler and Barak, 2012). This is significant when considering the affect mood has on computer mediated teams.

**Effect of Mood**

Literature has shown mood can have a contagion effect, as previously described. That affect can be found between team members as well as between the leader and team members. When a leader presents a positive mood, not surprisingly team performance is enhanced, Chung, & Tsai, 2011). Liu, Tangirala, Lam, Chen, Jia, and Huang (2015) explored how an employees’ voice or ability to express opinions and ideas about work-related issues is affected by the interpersonal role of moods. The mood acts as a social cue that infers the attitude and behaviors to others. In the affect-as-social-information perspective, as described by Liu et al., a positive mood presents interpersonal security by the team members. This security then allows for a safe social context in which the members can use their promotive voice meaning they can speak and feel as if they will be heard and recognized (Liu et al., 2015). The chance for interactions to be misinterpreted as personal criticism is decreased and receptiveness to challenges of the current state is increased due to the perceived psychological safety resulting from the expression of a positive mood.

Pfaff (2009, 2012) and Pfaff and McNeese (2010) examined the role mood plays on a team’s reasoning, which they report as being under studied and playing a much larger role than previously acknowledged. Stress and emotion impact the cognitive task performance of teams (Pfaff, 2009). Negative affect or mood decreases a team’s outlook to the point of becoming unmotivated. A positive team however results in enhanced team awareness, more and more productive communication, and more detailed verbal responses among members. When disentangling stress from mood the opportunity arises to create specific interventions that will support team awareness and enriched task functioning. So therefore we theorize:

*H1: Negative affect (aka mood) will negatively correlate with individual perceptions of (H1a) team benevolence , (H1b) team integrity and (H1c) team ability in virtual reality teams.*

As mentioned earlier in this paper, a positive mood builds trust. The increased trust level encourages team members to express opinions, ideas, and feelings with one another and expect reciprocation via acceptance, support and corresponding disclosures (Tseng, & Ku, 2011). In addition, Tseng and Ku (2011) noted a high level of trust resulted in a strong team performance, team satisfaction, and team work. While often the idea that a negative communicator within the group can have negative repercussions for the team performance, Yilmaz’s study (2016) found such negative communication behaviors can trigger higher group performance. By pushing others to consider alternatives and think more critically thereby avoiding hasty decisions that could prove to be less effective. A dissenting member causes the other members to pause and consider what is being said critically leading to better analysis and adherence to task requirements (Yilmaz, 2016). The above provides support for the following hypotheses:

*H2: Individual perceptions of (H2a) team benevolence, (H2b) team integrity, and (H2c) team ability will positively correlate with team trustworthiness in both face-to-face and virtual reality teams.*

*H4: Individual perceptions of team trustworthiness will positively correlate with team potency in both face-to-face and virtual reality teams*.

**Team and Job Satisfaction**

*H3. Individual perceptions of team trust will positively correlate with team satisfaction in both face-to-face and virtual reality teams.*

While understanding that positive moods create positive outcomes and negative moods create negative outcomes, it is necessary to look beyond the mood and consider the resulting behaviors. For Vranjes, Baillien, Vandebosch, Erreygers, and DeWitte (2017), the consequence of confronting the stressors in the workplace, can give rise to negative emotions and moods, which can then manifest themselves into cyberbullying behavior.

*H5: Individual perceptions of team satisfaction will positively correlate with satisfaction with team potency in both face-to-face and virtual reality teams.*

Jung and Sosik (2003) examined group efficacy also referred to as potency. This phenomenon in a group can be very strong and becomes more homogenous the more the group interacts over time. Just as in self-efficacy, where an individual believes in the ability to accomplish goals, group efficacy is an extension of that definition. Groups that have a high perception of potency are more effective when completing tasks (Jung & Sosik, 2003).

Trust, according to Breuer, Huffmeier, and Hertel (2016), is significantly related to team satisfaction and team consistency. Effectiveness was found to be stronger in virtual teams per the research conducted by Breuer et al.

**Face-to-Face and Computer-Mediated Teams**

Haines (2014) found that computer mediated teams are able to overcome obstacles and have the same experience as face-to-face teams. Because of the communication used in computer-mediated teams, there is more pressure to conform and accomplish tasks that rely on trust but, as the team develops, more trust in peers is developed and the team works more effectively (Haines, 2014). While Paul and McDaniel (2004), argued that face-to-face contact is imperative for building trust, others disagree. Haines (2004) and Piccoli and Ives (2003) acknowledged the challenges in computer mediated teams but, with communication and time, virtual teams are able to obtain a high level of trust, which then needs to be maintained until the project is completed. A psychological contract, which arises from an agreement among team members about expectations and obligations, is created among team members as a natural outgrowth of reciprocal responsibilities (Piccoli & Ives, 2003). When that contract is breached, trust can be damaged. In virtual teams, reneging early on went largely undetected and was considered to be minor having no negative consequences for the team. Potter and Balthazard (2002) similarly found that the interaction styles of computer-mediated teams that affect performance and processes are similar to those of conventional teams.

*H6: Individual perceptions of team benevolence, team integrity, team ability, team trust, team satisfaction, and team potency will be higher in face-to-face versus virtual reality teams.*

**RESEARCH MODEL**

The theoretical model tested in this paper is presented in Figure 1. The model suggests that negative affect is correlated with three components of trust; benevolence, integrity, and ability (H1). These three components are correlated with perceptions of trustworthiness (H2) which, in turn, predicts satisfaction (H3) and potency (H4). Finally, satisfaction is correlated with potency (H5). Hypothesis 6, not represented in the model, predicts that perceptions of benevolence, integrity, ability, trustworthiness, satisfaction, and potency all operate at higher levels in a face-to-face team than in a virtual reality team. In this paper, a virtual team is referred to as a virtual reality team to avoid the connotation that the term “virtual” means “nearly” or “almost.” Here, a virtual team is defined as a dispersed group of people communicating over lean media. Our overall research model is depicted in Figure 1.

Insert Figure 1 about here.

**Participants**

Subjects were 216 students enrolled in 15 sections of 7 management courses at a comprehensive, regional, public university. One hundred of the subjects were female and 115 were male. One hundred nine subjects were assigned to a virtual reality team condition and the remaining one hundred seven were assigned to a face-to-face condition. In the virtual reality team condition, fifty-one of the subjects were female and fifty-eight male. In the face-to-face condition, forty-nine of the subjects were female and fifty-seven were male.

**Measures**

Negative affect (10 items) was measured from the scale of Watson, Clark, and Tellegen (1988). Benevolence (5 items), integrity (6 items), ability (6 items), and trustworthiness (8 items) were taken from Jarvenpaa, Knoll, and Leidner (1998). The benevolence, integrity, and ability items were originally from a Schoorman, Mayer, and Davis (1996) working paper modified by Jarvenpaa Knoll, and Leidner (1998) to reflect a team rather than dyadic context. The trustworthiness items were originally from Pearce, Sommer, Morris, and Frideger (1992) also modified by Jarvenpaa et al. (1998) to reflect a team rather than an organizational environment. Satisfaction (13 items) was taken from Keyton (1991), which captures a full-range of global team satisfiers. Potency (8 items) was captured using items from Guzzo, Yost, Campbell, and Shea (1993). All items were rated by subjects on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree”. Since multiple items were collected per variable, scale scores were created by calculating a mean of the items for estimation of each construct.

**Procedures**

Subjects were randomly assigned to either a face-to-face (107 subjects) or a virtual reality team (109 subjects) condition. Within each condition, subjects were further randomly assigned into 4-person groups. Groups in both conditions worked together for 30 minutes to complete a brief project that required delivery of a set of solutions upon which all members of each group agreed. Since subjects included students from multiple courses, a different project deemed similar in complexity and difficulty was given to each group in their respective courses.

Subjects filled out a brief survey to capture the negative affect construct. This collection was completed before the subjects began the group assignment and before the subjects knew that they would shortly be assigned into either a face-to-face or virtual reality team group. This was done so that subjects’ negative affect ratings would neither be influenced by the condition to which they were assigned nor

Groups in the face-to-face condition completed the assignment collocated with one another while the groups in the virtual reality team condition completed the assignment using an online chat program. This program allowed only typed messages to be sent to all members of the group. For the virtual reality team condition, the first and only contact team members experienced was over the chat program to preserve the anonymity factor.

Data were analyzed using multiple regression to test hypotheses 1 through 5. Standardized betas, F-statistics, and p-values were calculated using computer statistics software. Error terms and multiple square correlations were calculated for the endogenous variables. To assess hypothesis 6, data were analyzed using Analysis of Variance (ANOVA) to calculate an F-statistic and p-value.

**RESULTS**

Means, standard deviations, scale correlations, and reliabilities for measures in this study are shown in the Table. Figures 2 and 3 summarize the results discussed below for both the face-to-face and virtual reality team conditions. The beta values discussed below and presented in the table are given as standardized betas.

Insert Table about here .

Hypothesis 1 was supported with negative affect negatively correlating with benevolence (beta = -0.20, p < 0.01), integrity (beta = -0.25, p < 0.01), and ability (beta = -0.21, p < 0.05) for the virtual reality team condition. Hypothesis 2 was partially supported with integrity (beta = 0.48, p < 0.01) and ability (beta = 0.50, p < 0.01) positively correlating with trustworthiness in the face-to-face to face condition. In further support of hypothesis 2, integrity (beta = 0.35, p < 0.01) and ability (beta = 0.58, p < 0.01) positively correlated with trustworthiness. Benevolence did not significantly correlate with trustworthiness in either the face-to-face or virtual reality team condition. In support of 3, trustworthiness positively correlated with satisfaction in both the face-to-face (beta = 0.66, p < 0.01) and virtual reality team (beta = 0.75, p < 0.01) condition. In support of hypothesis 4, trustworthiness positively correlated with potency in both the face-to-face (beta = 0.50, p < 0.01) and the virtual reality team (beta = 0.56, p < 0.01) condition. Satisfaction positively correlated with potency in both the face-to-face (beta = 0.44, p < 0.01) and virtual reality team (beta = 0.29, p < 0.01) condition. Finally, an ANOVA revealed that benevolence (F = 30.01, p < 0.01), integrity (F = 25.44, p < 0.01), ability (F = 27.93, p < 0.01), trustworthiness (F = 39.83, p < 0.01), satisfaction (F = 22.34, p < 0.01), and potency (F = 36.52 p < 0.01) were higher in the face-to-face than in the virtual reality team condition confirming hypothesis 6.

Insert Figure 2 about here.

Insert Figure 3 about here.

**DISCUSSION OF RESULTS**

**Conclusions and Future Direction**

It would be incorrect to believe people want to feel good at all times (Tamir & Gutentag, 2017). Different situations call for different emotions and moods. Depending on variables such as demographics, for example age and gender, personality, culture, and the situation, people desire different emotions and moods (Tamir & Gutentag, 2017). Emotions affect behavior and individuals are interested in optimizing behavior. The more someone likes a particular feeling, the more they will pursue it. Depending on the outcome desired people desire certain emotions. Certain strategies can be used to decrease or increase certain emotions. As Tamir and Gutentag (2017) noted, leaders can possibly gain support for certain policies or undertakings by shaping the group members’ emotions.

The role of the leader also needs to be considered. When a leader exhibits a positive mood there is an effect on team performance, which is enhanced and improved. This is due to transformational leadership and affirmative group affective tone (Chi, Chung, & Tsai, 2011). Leaders need to create a social context that is considered psychologically safe by group members where risks are accepted and even encouraged (Liu, Tangirala, Lam, Chen, Jia & Huang, 2015). By focusing on building and maintaining a positive mood, team members perceive a more approachable leader who encourages the use of a promotive or self-advocating voice and rewards members for speaking up and challenging the present situation. A leader’s positive mood reduces members’ interpretation of feedback received during a negative mood as personal criticism. If a communication were to be misconstrued as positive yet was actually meant in a negative manner, ostracism and ridicule by the team could result (Liu et al., 2015). Those in a position of higher status such as a manager or instructor, have more prominence and more capability to influence behavior. The same situation would exist if there were a poor relationship between individuals. Employees or students would know it best to access the mood of the person in such a position before being willing to undertake a promotive voice. Cogliser, Gardner, Gavin, and Broberg (2012) found task and social-oriented leaders emerge and with the characteristics of agreeableness and conscientiousness. These characteristics evoke a positive mood and affect the team’s behavior.

The existence of negative and aggressive moods adds to stressors in the workplace. These stressors risk developing into cyberbullying in computer mediated teams. For Vranjes, Baillien, Vandebosch, Erreygers, and DeWitte (2017), the consequence of confronting the stressors in the workplace, can give rise to negative emotions and moods, which can then manifest themselves into cyberbullying behavior. The use of emotion regulation strategies is a worthwhile investment to counter the creation and existence of this incivility in the workplace (Vranjes, Baillien, Vandebosch, Erreygers, & DeWitte, 2017). When working in computer mediated teams, it is especially important for leaders to respond to this potential threat by working to reduce the existence of stressors as much as possible. In addition, strategies need to be put in place that will assist in regulating emotions and thereby pre-empting any disturbance that may result from the existence of negative moods and emotions within the team (Vranjes et al., 2017). While understanding that positive moods create positive outcomes and negative moods create negative outcomes, it is necessary to look beyond the mood and consider the resulting behaviors. Haines (2014) suggested managers of computer mediated teams “should cultivate virtual workspaces that are similar to those proven to work in face-to-face contexts: (1) teams should have clear, specific goals, (2) members should be encouraged or even required to communicate with each other, and (3) team members should feel that they might work with the other team members again” (Haines, 2014, p.1)

There are areas for future research into the topic of moods and its effect on teams, particularly ones that are computer mediated. As van Kleef, Heerdink, and Homan (2017) discussed, the traditional belief that emotions wreak havoc on teams by clouding judgment, causing poorly rationalized and impulsive decisions, is outdated. Because of the intricate nature of emotions and moods, social interactions, and group functioning, research into the Emotions as Social Information Theory lends itself to further research. Emotions fulfill key social functions and aid groups in addressing the problems that are inherent in working with all types of groups. Further research can aid in integrating theories that view emotions and moods as providing critical links to the challenges experienced in teams (van Kleef et al., 2017).

Interpersonal Emotion Regulation (IER) as discussed by Niven (2017), is a goal-directed, resource intensive process and also a possibility for further study. By undertaking such a process, there is the possibility to affect team members in terms of compassion and instrumentality. It can also have consequences further down the road to positively influence behavior and health outcomes of individuals and the team. Through the use of IER, relationship formation and development is influenced and over time allows for coregulation. IER is dynamic and creates the opportunities for interactions to be used in a variety of ways. One idea to be further explored is the use of video-cued recall whereby interactions are video recorded. These recordings are then replayed numerous times for participants to retrospectively review the interaction in order to identify behaviors that affect goals, feelings and so on (Niven, 2017). Another option is state-space grids where an individual’s emotions or state is diagramed. The goal is to see the dynamic change happening over time (Niven, 2017).

**Limitations**

The authors of this paper recognize that no study is without flaws and identified three main limitations of this study. First, subject consisted of students from one university in one management program. A more diverse sample will shed light on whether the model tested in this paper can be generalized to all students in multiple programs of study. Second, the constructs under study were conceptualized, measured, and tested at the individual level only; group level effects were ignored. Third, collection of constructs did not eliminate the possibility of single-source bias; both exogenous and endogenous variables were collected from a single source within the same instrument. Nevertheless, the authors believe that the model presented and tested in this paper represents competent research into the perceptions of students in face-to-face and virtual reality teams.

**REFERENCES**

Barsade, S. G. & Gibson, D. E. (2000). Group affect: Its influence on individual and group outcomes. *Current Directions in Psychological Science, 21*(2): 119–123.

Barsade, S. G. (2015). Group affect. *Annual Review of Organizational Psychology and Organizational Behavior, 2*: 21- 46.

Breuer, C., Huffmeier, J., & Hertel, G. (2016). Does trust matter more in virtual teams? A meta-analysis of trust and team effectiveness considering virtuality and documentation as moderators. *Journal of Applied Psychology, 101*(8): 1151-1177.

Chesin, A., Rafaeli, A., & Bos, N. (2011). Anger and happiness in virtual teams: Emotional influences of text and behavior on others’ affect in the absence of non-verbal cues. *Organizational Behavior and Human Decision Processes 116*: 2–16.

Chi, N., Chung, Y., Tsai, W. (2011). How do happy leaders enhance team success? The mediating roles of transformational leadership, group affective tone, and team processes. *Journal of Applied Social Psychology, 41*(6), 1421-1454.

Cogliser, C. C., Gardner, W. L., Gavin, M. B., & Broberg, J. C. (2012). Big Five personality factors and leader emergence in virtual teams: Relationships with team trustworthiness, member performance contributions, and team performance. *Group & Organization Management*, *37*(6): 752-784.

Connelly, C. E., & Turel, O. (2016). Effects of team emotional authenticity on virtual team performance. *Frontiers in Psychology,7*: 1-13. doi: 10.3389/fpsyg.2016.01336

Cropanzano, R., & Mitchell, M. S. (2005). Social Exchange Theory: An Interdisciplinary Review. *Journal of Management, 31*: 874-900. doi: 10.1177/0149206305279602

Fowler, J. H., & Christakis, N. A. (2008). Dynamic spread of happiness in a large social network: longitudinal analysis over 20 years in the Framingham Heart Study. *British Medical Journal* (*BMJ), 337*:a2338: 1-9. doi:10.1136/bmj.a2338

Fuller, C . M., Marett, K., & Twitchell, D. P. (2012). An examination of deception in virtual teams: Effects of deception on task performance, mutuality, and trust. *IEEE Transactions on Professional Communication, 55*(1): 20-35. doi: 10.1109/TPC.2011.2172731

Guillory, J., Spiegel, J., Drislane, M., Weiss, B., Donner, W., & Hancock, J. T. (2011). Upset now?: Emotion contagion in distributed groups. *Conference: Proceedings of the International Conference on Human Factors in Computing Systems*, CHI 2011, Vancouver, BC, Canada: 745-748. doi 10.1145/1978942.1979049

Guzzo, R. A., Yost, P. R., Campbell, R. J., & Shea, G. P. (1993). Potency in groups: Articulating a construct. *British Journal of Social Psychology, 32*: 87-106.

Jarvenpaa, S. L., Knoll, K., & Leidner, D. E. (1998). Is anybody out there? Antecedents of trust in global virtual teams. *Journal of Management Information Systems, 14*(4): 29-64.

Jung, D. I., & Sosik, J. J. (2003). Group potency and collective efficacy. Examining their predictive validity, level of analysis, and effects of performance feedback on future group performance. *Group & Organization Management, 28*(3): 366-391. doi: 10.1177/1059601102250821

Haines, R. (2014). Group development in virtual teams: An experimental reexamination. *Computers in Human Behavior, 39*: 213-222. doi: 10.1016/j.chb.2014.07.019

Keyton, J. (1991). Evaluating individual group member satisfaction as a situational variable. *Small Group Research, 22*(2): 200-219.

Kramer, A. D. I., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive-scale emotional contagion through social networks. *Proceedings of the National Academy of Sciences (PNAS)*: 1-3. doi: 10.1073/pnas.1320040111

Kuo, E. W., & Thompson, L. F. (2014). The influence of disposition and social ties on trust in new virtual teammates. *Computers in Human Behavior 37*: 41–48. http://dx.doi.org/10.1016/j.chb.2014.04.030

Lawler, E. J. (2001). An Affect Theory of Social Exchange. *American Journal of Sociology, 107*(2): 321-352. doi: 10.1086/324071

Lapidot-Lefler, N., & Barak, A. (2012). Effects of anonymity, invisibility, and lack of eye-contact on toxic online disinhibition. *Computers in Human Behavior, 28*: 434–443.

Likoebe, M. M., & Agarwal, R. (2004). Managing team interpersonal processes through technology: A task-technology fit perspective. *Journal of Applied Psychology, 89*(6): 975-990. doi: 10.1037/0021-9010.89.6.975

Liu, W., Tangirala, S., Lam, W., Chen, Z., Jia, R. T., & Huang, X. (2015). How and when peers’ positive mood influences employees’ voice. *Journal of Applied Psychology, 100*(3): 976–989. doi: 10.1037/a0038066

Lowry, P. B., Schuetzler, R. M., Giboney, J. S., Gregory, T. A. (2015). Is trust always better than distrust? The potential value of distrust in newer virtual teams engaged in short- term decision-making. *Group Decision and Negotiation, 24*(4): 723-752.

Mayer, R. C., & Davis, J. H. (1995). An integrative mode of organizational trust. *Academy of Management Review, 20*(3): 709-734.

Niven, K. (2017). The four key characteristics of interpersonal emotion regulation. *Current Opinion in Psychology, 17*: 89–93.

Paul, D. L., & McDaniel, Jr., R. R. (2004). A field study of the effect of interpersonal trust on virtual collaborative relationship performance. *MIS Quarterly, 28*(2): 183-227.

Pearce, J. L., Sommer, S. M., Morris, A., Frideger, M. (1992). A configurational approach to interpersonal relations: Profiles of workplace social relations and task interdependence. Working paper OB92015, Graduate School of Management, University of California, Irvine.

Pfaff, M. S. (2009). Effects of mood and stress on group communication and performance in a simulated task environment. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 69*(8-B): 5085.

Pfaff, M. S., & McNeese, M. D. (2010). Effects of mood and stress on distributed team cognition. *Theoretical Issues in Ergonomics Science, 11*(4): 321-339.

Pfaff, M. S. (2012). Negative affect reduces team awareness: The effects of mood and stress on computer-mediated team communication. *Human Factors, 54*(4). *Special Issue: Methods for the Analysis of Communication*. 560-571.

Piccoli, G., & Ives, B. (2003). Trust and the unintended effects of behavior control in virtual teams. *MIS Quarterly, 27*(3): 365-395.

Potter, R. E., & Balthazard, P. A. (2002). Virtual teams interaction styles: Assessment and effects. *International Journal of Human-Computer Studies, 56*(4): 423-444. doi.org/10.1006/ijhc.2002.1001

Schoorman, F. D., Mayer, R. C., & Davis, J. H. (2016). Empowerment in veterinary clinics: the role of trust in delegation. *Journal of Trust Research 6*(1): 76-90. doi: 10.1080/21515581.2016.1153479

Tamir, M., & Gutentag, T. (2017). Desired emotional states: their nature, causes, and implications for emotion regulation. *Current Opinion in Psychology, 17*: 84–88.

Totterdell, P., Kellett, S., Teuchmann, K., & Briner, R. B. (1998). Evidence of mood linkage in work groups. *Journal of Personality and Social Psychology: 74*(6), 1504-1515.

Tseng, H. & Ku, H. (2011). The relationships between trust, performance, satisfaction, and development progressions among virtual teams*. The Quarterly Review of Distance Education, 12*(2): 81–94.

van Kleef, G. A., Heerdink, M. W., & Homan, A. C. (2017). Emotional influence in groups: The dynamic nexus of affect, cognition, and behavior. *Current Opinion in Psychology, 17*: 156–161.

Volmer, J. (2012). Catching leaders’ mood: Contagion effects in teams.*Administrative Sciences*, *2*: 203-220. doi:10.3390/admsci2030203

Vranjes, I., Baillien, E., Vandebosch, H., Erreygers, S., & DeWitte, H. (2017). The dark side of working online: Towards a definition and an Emotion Reaction model of workplace cyberbullying. *Computers in Human Behavior, 69*: 324-334.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology: 54*(6), 1063-1070.

Yilmaz, G. (2016). What you do and how you speak matter: Behavioral and linguistic determinants of performance in virtual teams. *Journal of Language and Social Psychology, 35*(1): 76–97. doi: 10.1177/0261927X15575772

**TABLE**

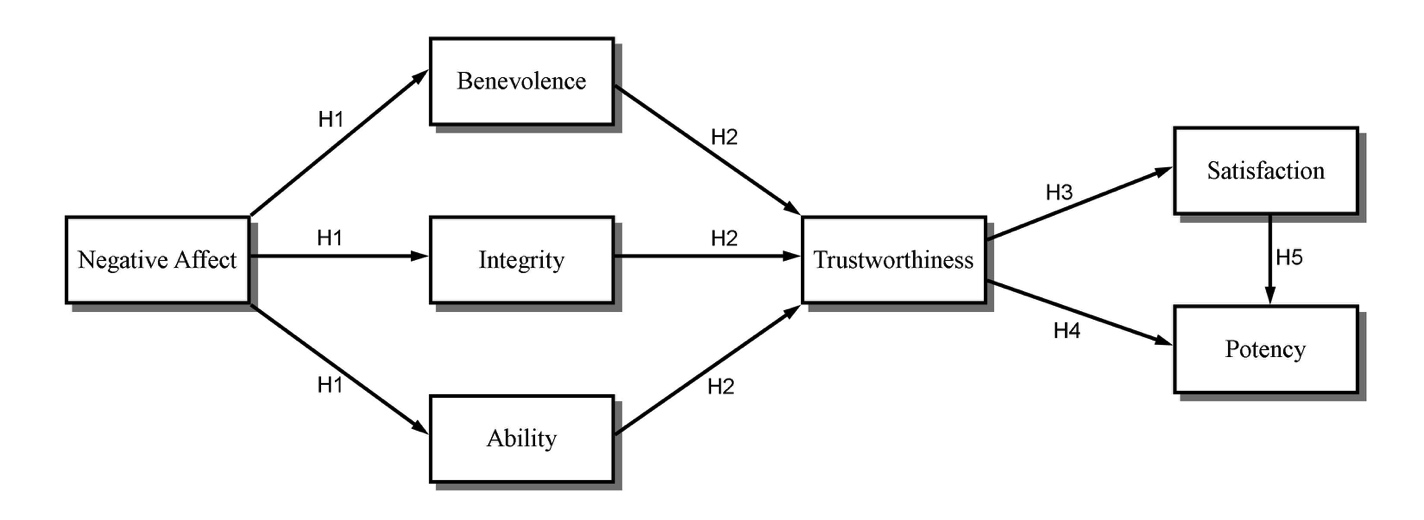
**Means, Standard Deviations, Correlations, and Reliabilities**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Means | | |  | s.d. | | |  | Correlations and Reliabilities | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | FtFT |  | CMT |  | FtF |  | CMT |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Negative Affect | 1.77 |  | 1.73 |  | 0.76 |  | 0.70 |  | **0.87** |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Benevolence | 3.84 |  | 3.33 |  | 0.70 |  | 0.84 |  | -0.09 | **0.84** |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3. Integrity | 3.80 |  | 3.35 |  | 0.64 |  | 0.68 |  | -0.18\* | 0.78\* | **0.82** |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4. Ability | 3.90 |  | 3.44 |  | 0.58 |  | 0.71 |  | -0.13 | 0.69\* | 0.81\* | **0.89** |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.Trustworthiness | 4.03 |  | 3.52 |  | 0.57 |  | 0.62 |  | -0.10 | 0.66\* | 0.78\* | 0.80\* | **0.88** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6. Satisfaction | 3.68 |  | 3.37 |  | 0.41 |  | 0.53 |  | -0.13 | 0.68\* | 0.75\* | 0.76\* | 0.79\* | **0.82** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7. Potency | 4.12 |  | 3.61 |  | 0.57 |  | 0.66 |  | -0.09 | 0.62\* | 0.74\* | 0.74\* | 0.86\* | 0.81\* | **0.92** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *Note.* Cronbach’s alpha coefficients shown along the diagonal. FtFT=face-to-face teams. CMT=computer-mediated teams. | | | | | | | | | | | | | | | |
| \* p<0.01 | | | | | | | | | | | | | | | |

**FIGURE 1**

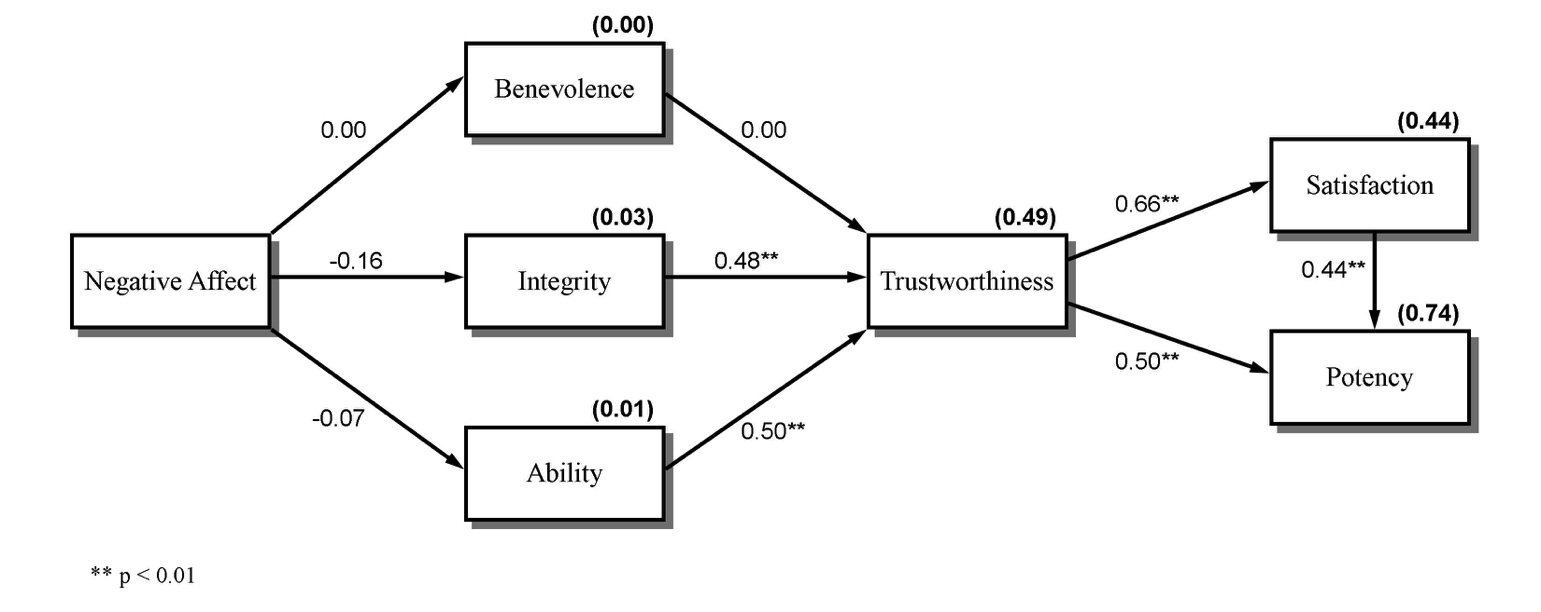
**A model of mood, trust, satisfaction, and potency in ad-hoc face-to-face**

**and computer-mediated teams.**



**FIGURE 2**

**Results for face-to-face teams**



**FIGURE 3**

**Results for computer-mediated teams**

