



Performance Feedback in a Virtual Team Setting

Linda S. Hartenian
University of Wisconsin Oshkosh

Laura L. Koppes
Eastern Kentucky University

E. Alan Hartman
University of Wisconsin Oshkosh

ABSTRACT

Just as organizations begin to appreciate the synergistic effect that teams can have on productivity, problem solving, and creativity, the concept “team” is taking on a new face. Virtual teams are the latest wave of structural innovations in organizations. While opportunities exist for teams to explore new horizons, virtual teams may present challenges to traditional methods of selecting, training, and evaluating team members. This exploratory study examines how virtual team members react to traditional forms of performance feedback. Drawing from research findings on cognitive processes and feedback processes, hypotheses were developed for recall accuracy and attributions of performance feedback in a virtual team setting.

One of five hypotheses on recall accuracy was fully supported; partial support existed for two of the five hypotheses. Recall of individual feedback was more accurate immediately following receipt of feedback; immediate recall of team feedback was no different than delayed. Limited support existed for the hypothesis that positive feedback would be recalled more accurately than negative. This was true only for individual feedback after a delay. Contrary to the hypothesis, negative team feedback was actually recalled more accurately after a delay.

Two of six hypotheses about attributions were supported. Positive team feedback resulted in increased attributions to the other team member, though attributions were not made to the team (as a whole) for positive feedback; and, positive individual feedback did not result in attributions to the individual. Attributions were not made to the team immediately following feedback, but attributions were made to the team after a delay (opposite of the hypothesis). A team-centric bias existed for delayed attributions.

The over-recall of individual and under-recall of team performance feedback are discussed as well as the team-centric bias. Recommendations for managers and implications for future research and practice are offered.



Performance Feedback in a Virtual Team Setting

Cutting-edge organizations are finding new methods for accomplishing work to take advantage of strategic opportunity (Rollier & Liou, 1998). Using advances in information technology (Igbaria, 1998), organizations develop new methods of accomplishing work such as flexible work scheduling (e.g., sharing office space) (Apgar, 1998) and telework (Donaldson & Weiss, 1998). Alternative workplaces—where work is moved to the worker rather than the other way around—are becoming more commonplace. New methods of organizing work, such as work-at-home, satellite offices, and sharing office space, are viewed as ways to increase effectiveness and efficiency.

Alternative workplaces are embraced as organizations seek to improve group and team efficiencies. Organizations find they are able to increase the speed of work, to enhance the transfer of information between people and across organizations, and to exploit information gathering, analysis, and dissemination processes. The results include cost savings (e.g., reduced overhead), increased productivity, and retention of talented employees in the workplace (Apgar, 1998).

The explosion of cyberspace technology and methods of scheduling work takes organizational structures in new directions, making virtual teams a reality. Certainly the technology itself is an important aspect of virtual team processes. Improved information technology is often the way by which individuals communicate with one another in a virtual team. Organizations have used technology (e.g., electronic meetings) for years to promote brainstorming and enhance group processes (Kahai, Sosik, & Avolio, 1997; Townsend, Whitman, & Hendrickson, 1995). “Managing a productive virtual team [however] requires more than access to technology” (Kimball & Eunice, 1999, p. 58).

Townsend, DeMarie, and Hendrickson (1998) defined a virtual team as a collection of individuals who maintain anonymity, have dependency without [face-to-face] contact, have individual accountability, are geographically separated, and engage in simultaneous, synchronous work. Virtual team members, therefore, work under very unique conditions. The challenges for managers of alternative workplaces are critical. Organizations will need managers who have strong supervisory skills and know how to manage projects (results) rather than activities (time) (Cascio, 2000), as well as identifying the most effective techniques for managing workers who can’t be directly supervised (Rollier & Liou, 1998). As virtual teams become a reality, organizations should explore whether traditional systems (e.g., work design, compensation, performance feedback) are still appropriate for use with virtual teams. The possibility exists that established systems and innovative structures, such as virtual teams, will no longer “fit” with one another. Cascio (2000) suggests that managers most likely will have to change their management style to ensure that virtual teamwork is accomplished. Apgar (1998) believes that managers will have a more difficult time providing guidance on job performance than they do in a traditional organizational setting--particularly challenging will be providing feedback because traditional forms of social interaction are missing.

We have chosen to study the performance feedback process because it is the mechanism by which managers are able to assist individuals and teams in accomplishing strategic objectives.



Feedback about specific performance objectives is critical because it improves recall of performance that is to be remembered (Thompson, 1998). Performance feedback to virtual team members is no less important than performance feedback to an employee in a traditional organizational environment.

Empirical research on virtual teams is in its infancy. The purpose of this research is to explore if existing theory on co-located teams also applies to the virtual team setting. This exploratory study expands upon previous knowledge about performance feedback in two ways. First, it extends current theory about performance feedback to a virtual team setting. Second, little virtual team research has been conducted on project-based virtual teams. This research extends our knowledge about virtual team processes when completing task-oriented activities. By extending our knowledge about how accurately virtual team members recall information and about the attributions that virtual team members make for team performance, organizations will better understand how to design performance feedback systems to fit new team models (e.g., virtual teams) and managers will better understand how to provide performance feedback to persons who don't work face-to-face.

Literature Review

By definition, work teams are groups—a group is “...two or more individuals, interacting and interdependent, who have come together to achieve a particular purpose” (Robbins, 2000, p. 217). Wagner and Hollenbeck (1998) point out that to understand team effectiveness, individual and dyad contributions must be studied (among other things). They go so far as to suggest that individual and dyad behaviors are necessary building blocks for effective teams. Further, dyad contributions are critical for team success. Virtual work teams, the focus of the present research, differ from other work teams in that they don't interact face-to-face (Robbins, 2000). When persons are co-located, they benefit from many common experiences; team members who are geographically separated must develop other strategies to create a sense of wholeness (Kimball & Eunice, 1999). These relationships are difficult to establish in a virtual team setting (Warkentin, Sayeed, & Hightower, 1997). Hypotheses are developed about the impact of traditional forms of performance feedback on virtual team recall accuracy and attributions drawing upon the performance appraisal literature, knowledge about cognitive processes, research on groups, and evolving team theory.

Recall Accuracy

When a virtual team member is told that a particular behavior, such as contacting other team members before making commitments, must be changed, the other team members hope that the individual will recall this feedback and change his or her behavior by remembering to contact others before making commitments. However, if the individual inaccurately recalls the intent or the content of the feedback, he or she may either neglect to change behavior (not contact others) or exhibit inappropriate behaviors (not conduct sufficient research upon which to make a decision to make a commitment).

Several factors that affect recall accuracy have been identified, such as the time interval between storing and recalling information (immediate versus delayed) (Wyer & Srull, 1986), positive versus negative feedback (Dustin, 1966), individual versus group feedback (Burger & Rodman,



1983), general or specific information (Feldman, 1981), the consistency/inconsistency of information with existing schemata (e.g., Taylor, Crocker, Fiske, Sprinzen, & Wrinkler, 1979), priming or cuing (Prussia & Kinicki, 1996), and interference (Anderson, 1985). While several studies have examined whether an individual who is conducting the performance can remember and recall information in an evaluation context (e.g. Murphy, Gannett, Herr, & Chen, 1986; Williams, DeNisi, Meglino, & Cafferty, 1986), the accuracy of recall by the person receiving the performance feedback has been addressed either briefly (Ilgen, Fisher, & Taylor, 1979) or not at all.

To further understand performance feedback in a virtual team setting, we examined the influence of three variables on recall accuracy: (1) individual and virtual team feedback (level), (2) immediate and delayed situations (timing), and (3) positive and negative feedback (positive/negative).

Individual and Virtual Team Feedback

Improving organizational performance requires individual as well as team improvements. If virtual team members are provided with performance feedback but recall feedback differently from each other and/or incorrectly, the team members may not work in concert. Ross and Sicoly (1979) found that participants could recall their own contributions more frequently and easily than contributions made by others. One explanation is the availability in memory of information about self versus information about others (Thompson & Kelley, 1981). It seems intuitive that individuals are more likely to have a cognitive schema about themselves than a schema about teams or others. If this is true, then individuals will have an easier time encoding and storing information about themselves (i.e., an existing schema) (Alba & Hasher, 1983) than about teams because teams and team feedback are such new phenomena. We propose:

H #1: Recall accuracy will be greater for individual performance feedback than for virtual team performance feedback.

Immediate and Delayed Recall

Wyer and Srull (1986) suggested that the time interval between storage and recall influences recall accuracy, pointing out that information recalled immediately (within hours) following cognitive storage is recalled more accurately than information recalled at a later point in time (e.g., one week or more later). Neuroimaging studies, which examined the brain's neurological structures that influence psychological processes, have found memory decay over time (i.e., behavioral performance decreases with increasing delays) (cf. Haxby, Ungerleider, Horwitz, Rapoport, & Grady, 1995). Others have found misinformation to increase after one week (Belli, Windschitl, McCarthy, & Winfrey, 1992; Ceci & Bruck, 1993; Chandler, 1993). Other findings support the worsening of memory from one time to another (cf. Rubin & Wenzel, 1996). Forgetting over time occurs because aspects of an experience become dissociated with one another (Reyna & Titcomb, 1997), and access to verbatim details declines (Reyna & Brainerd, 1995). Accuracy of memory and recall of performance have not been studied extensively in an organizational context; no research has been conducted in a virtual team context. We propose:



H #2a. Virtual team members will have better recall accuracy immediately following individual feedback than one week later.

H #2b. Virtual team members will have better recall accuracy immediately following team feedback than one week later.

Positive and Negative Feedback

If virtual team members are given feedback properly on their performance, both positive and negative feedback are provided. Positive feedback is given to reinforce correct behaviors. Negative feedback is given to identify areas for improvement. To continue exhibiting correct behaviors, the virtual team member must recall positive feedback. To change one's behavior, the virtual team member must remember negative feedback. Researchers have revealed differences in the recall accuracy of positive versus negative feedback at the team and individual levels. On the one hand, early work by

Dustin (1966) on negative feedback in a team setting found that participants inaccurately recalled negative team feedback. He suggested that individuals distort team feedback to avoid lowering their ego levels. Others (Levinson, 1994) also proposed that individual self-esteem is threatened by poor performance, possibly resulting in a negative stigma (Sutton & Callahan, 1987). The distortion of negative feedback proposed by Dustin may occur because team members wanted to protect the team's image. Subsequent research findings by Ilgen et al. (1979) on an individual's reaction to feedback on their own performance were consistent with Dustin's findings--individuals had more difficulty recalling negative (than positive) feedback. Ilgen et al. explained the difficulty in recalling negative feedback as a defense mechanism--positive feedback was more likely to be remembered because it was pleasant and enhanced one's self-image. On the other hand, Wyer & Frey (1983) found that individuals receiving negative feedback recalled more information than those receiving positive information. And, Donlin (1990) found that negative feedback was recalled more accurately, possibly helping the individual to master his or her environment or in an attempt to refute the validity of negative information. On balance, however, findings at both the team and individual levels, therefore, suggest that positive information is recalled more accurately than negative feedback. We propose:

H #3a. Virtual team members will have better recall accuracy for positive than for negative individual feedback.

H #3b. Virtual team members will have better recall accuracy for positive than for negative team feedback.

Attributions

According to Kelley (1967), an attribution is an explanation of responsibility for events and behaviors. In achievement-oriented settings, individuals may attribute their success or failure to ability, effort, task difficulty, and luck (Weiner, 1980). Ability and effort are described as internal causes for success or failure (i.e., internal locus of control); task difficulty and luck are



described as external causes for success or failure (i.e., external locus of control). Attribution theory purports that when individuals take responsibility for an outcome, they will attribute their performance to ability and effort. They are said to use internal attributions to explain their behavior. When individuals feel that the cause of their success or failure is something other than their own ability or effort, they are said to use external attributions. In this latter case, attributions could be based on job requirements, resource availability, or people (e.g., supervisor, co-worker) over whom the individual has no control.

Research findings on team attributions are consistent with Kelly (1967) and Weiner's (1980) theories. Interestingly, people assign responsibility for team success and failure whether they are observing or participating in a team. Tanner Sev'er, and Unger (1989) and Unger and Sev'er (1989) found that spectators attributed sports teams' successes to internal causes and team failure to external causes.

Similar to work groups in any organization, virtual teams perform in achievement-oriented situations where the team's success depends upon individual contributions toward the team's goals and objectives. When performance feedback is given to virtual team members about their individual performance and the virtual team's performance, organizations hope that the feedback will be used by virtual team members to improve their individual performance as well as team performance on future tasks and activities. Consistent with research on attributions (Feldman, 1981), we believe virtual team members will also make attributions for their performance when presented with performance feedback. Attributions made to internal or external factors could subsequently affect whether or not the virtual team member believes and accepts the performance feedback (Ilgen et al., 1979) and reacts to it (i.e., changes behavior). Understanding how virtual team members attribute causes for their individual performance is just as important as understanding attributions in a typical work group; if the virtual team member thinks his or her level of performance is due to external factors, he or she may not attempt to change his or her behavior.

To further understand the effects of attributions in a virtual team situation, we examined the influence of two specific variables on attributions: positive and negative feedback, and the timing of performance feedback (immediate and delayed). We wanted to know if virtual team members attributed their team's performance to their own individual contributions or to their team members' contributions.

Positive and Negative Feedback

When a supervisor or coworker gives positive feedback to an individual or team, he or she typically offers praise or acknowledges that the individual or team has performed well and/or made a valuable contribution to an important objective. Positive feedback may be accompanied by a tangible reward. Negative feedback, on the other hand, is seen as a criticism of an individual or team contribution and/or the withholding of a reward. To understand the effects of positive and negative feedback on attributions, we examined existing theory on the "self-serving" bias (Hellreigel, Slocum, & Woodman, 1992) and on the nature of perceived responsibility for group outcomes (Burger & Rodman, 1983).



For the individual, a self-serving bias would be exhibited if he or she attributed his or her behaviors (i.e., level of performance) to internal causes when the outcomes were positive and to external causes when the outcomes were negative (Arkin & Maruyama, 1979). Studies have demonstrated that the self-serving bias exists. For example, Clapham and Schwenk (1991) found that CEOs made self-serving attributions for firm performance. Levy (1993) found that for positive self-appraisals, individuals were more likely to make internal attributions for their performance and less likely to make external attributions. And, Rantilla (2000) found internal attributions for successful outcomes at the individual level.

Attributing success to internal causes and failure to external causes most likely protects one's ego (Kelley, 1967; Weary-Bradley, 1978). Individuals want to receive credit for the good consequences of their behavior (Huber, Podsakoff, & Todor, 1986), but will use face-saving devices (e.g., externalizing) to minimize the effect of failure (Deppe & Harackiewicz, 1996). Subsequently, positive feedback is more acceptable to individuals than negative feedback (Miller, 1976), and the negative aspects of feedback will be downplayed (Nisbett & Ross, 1980). Continuing with the study of this externalizing process is important because external causality can result in retaliation (Weiner, 1993). In the case of virtual teams, retaliation could occur toward the organization (for putting the person in such a poor team situation).

At a team level, we reviewed studies about the effect of group feedback on attributions and the level of responsibility that group members were willing to take for group performance (cf. Dustin, 1966; Nadler, 1979). Research findings have been mixed. On the one hand, Schlenker, Soraci and McCarthy (1976) reported that group members were willing to take responsibility for successful group performance, but attributed unsuccessful performance to other members in the group. Similarly, Ross and Sicoly (1979) found that participants in a team project gave themselves more credit than they gave other team members for a good team outcome (an “ego-centric” bias). On the other hand, Burger and Rodman (1983) found that participants working in dyads attributed greater responsibility for a positive outcome to their partners than to themselves. Forsyth and Kelley (1994) also found that more responsibility was given to team members for team success. Tang and Tang (1986) found that individuals gave others more credit when positive (as opposed to negative) feedback was received. On balance, our hypothesis regarding self versus other attributions for successful team performance is drawn from the latter findings.

Finally, research also has shown a tendency for individuals to attribute successful performance to the group or team, as a whole. Imamoglu (1991) found that successful outcomes led to attributions to the team. Zaccaro, Peterson, and Walker (1987) believe this is more likely to occur with increased interdependence among team members. Rantilla (2000) has referred to this as a “group-serving bias” for successful outcomes.

H #4a. Virtual team members will attribute performance to self when given positive individual feedback and to others when given negative individual feedback.

H #4b. Virtual team members will attribute performance to the other team member when given positive team feedback and to themselves when given negative team feedback.



H #4c. Virtual team members will attribute performance to the team (self plus other) when given positive feedback (as opposed to negative feedback).

Immediate and Delayed Attributions

We study attributions in a virtual team setting to understand better when a virtual team member is most likely to change his or her behavior or to expect someone else in the virtual team to change. Supervisors or coworkers who are interested in helping a virtual team member to change his or her behavior(s) may want to understand the best time to do so.

For the individual, we know that attributions occur when performance feedback is given (Ilgen et al., 1979), and that attributions change over time depending on how feedback is cognitively stored (Thompson & Kelley, 1981) and whether feedback is perceived to be salient (Ross & Sicoly, 1979). In studies on feedback salience for individuals, as well as for groups, information about the self was more salient after a delay. Ross and Sicoly (1979) found that over time (i.e., after a delay), more personally salient information led an individual to make an internal attribution. Burger and Rodman (1983) found that information about self was more salient and available after a delay, while information about the other team member was more salient immediately following performance. We could find no research on these effects in a virtual team setting. Hypothesis 5c is based on the directional hypotheses for 5a and 5b. We explore:

H #5a. Virtual team members will attribute their individual performance to the other team member immediately following feedback and to self when attributions are delayed.

H #5b. Virtual team members will attribute team performance to the other team member immediately following feedback and to self when attributions are delayed.

H #5c. Virtual team members will attribute performance to the team (self plus other) immediately following feedback (as opposed to delayed).

Research on virtual teams is in its infancy. A review of the literature could find no studies exploring how accurately individual and team performance feedback were recalled in a virtual team setting. In addition, attributions for performance in a virtual team setting have not been studied. We undertook this laboratory study to examine recall accuracy of, and attributions for, performance feedback when (1) two levels of feedback were provided (individual and team), (2) recall was asked for at two points in time (immediately following task completion and one week later), and (3) positive and negative performance feedback were given.

Method

Participants

Participants were 97 undergraduate students at a mid-sized regional university. Complete data were obtained from 94 participants. Participants were solicited through an undergraduate course and received course credit for participating in the research. The ethical standards of the



American Psychological Association were followed. Informed consent forms were signed by all participants.

Team Setting

This experimental study created a hypothetical virtual team situation so that performance feedback about individual and team performance could be provided. Participants were provided with feedback on the outcomes of their work (i.e., work results, as opposed to work behaviors). Participants were told that the other team member was in another room and was going to assist in the completion of two tasks.

The team in this experiment was considered to be a virtual team because participants were “physically separated” from one another. Participants also were held individually accountable (i.e., individual performance feedback) yet they were dependent upon the other virtual team member for team performance (reflected in “team” performance feedback). Dyads have been successfully used in other research to demonstrate patterns of attributions in teams (Imamoglu, 1991). And, manual (as well as automated) tasks are appropriate subjects for the study of virtual teams (Amberg & Zimmerman, 1998).

Procedure

When the participant arrived, he or she was greeted by the experimenter and given a description of the research. The experimenter explained that “with recent changes in how people work, with more and more people working at home and only occasionally going to the office, ...it [was] important to understand how these working relationships [would] function.” Participants were told they would be completing two tasks -- a “word” task and a “model” task. In the word task, participants were given a matrix of letters in which words dealing with environmental issues had been imbedded. Participants were asked to find and circle as many words as they could in the time allotted. In the model task, participants were shown a picture of a completed Lego helicopter model and asked to replicate as much as they could in the time allotted using Legos. The participant was told that another participant located in another room would be working sequentially on the tasks, but that the participants would not interact with one another during the experiment. The participant then was given the first task and asked to complete as much as possible in five minutes. After five minutes, the task was removed by the experimenter. To simulate a real situation, the experimenter had the participant wait six minutes to allow time for the fictitious virtual team member to work on the task and for the experimenter to score the task. The experimenter then provided fictitious individual performance feedback (positive or negative) and virtual team performance feedback (positive or negative) to the participant. Performance feedback was reported using a five-point scale that ranged from “much below average” (scored as a “1”) to “superior” (scored as a “5”). At that point, the participant completed a questionnaire asking him or her to recall what he or she had been told about his or her individual performance and team performance and asking him or her to make attributions for individual and team performance. The participant then was given the second task to perform, the feedback procedure was repeated, and a second questionnaire was completed. During the initial debriefing, the participant was thanked for taking part in the study and informed that a full debriefing would occur in approximately a week. To create the delayed recall situation, a



questionnaire was completed by each participant one week later. The participant then was fully debriefed.

Experimental Conditions

Participants were assigned randomly to either positive or negative individual feedback situations and to either positive or negative virtual team feedback situations. Positive individual performance and virtual team performance feedback were phrased as, "based on what we expected could be accomplished in five minutes, you/your team did above average, a 4 on a 5-point scale." For the negative individual and virtual team performance feedback, participants were told they had performed below average, a 2 on a 5-point scale.

Dependent Measures

Recall/Attribution Questionnaires (one for the "word" task and one for the "model" task) were created to collect data on recall accuracy and attributions. To measure recall accuracy, participants were instructed to circle the response that matched what they had been told about their individual performance and about their team performance on a Likert-type scale [from "superior (5)" to "much below average (1)"]. To measure attributions, participants were asked to indicate on six separate Likert-type scales ["strongly agree (SA)" to "strongly disagree (SD)"] whether their individual performance and their virtual team's performance was due to their individual effort, their individual ability, their team member's effort, their team member's ability, task difficulty, and luck.

Results

Overall Manipulation Checks

Two manipulation checks were completed to ensure the team context existed and to examine if the order of tasks affected the outcomes. First, participants were asked in the initial debriefing if they believed another person was working on the task. If the participant doubted that another participant also was working on the tasks, these data were not included in the final analysis. Second, the ORDER of the tasks ("word" first or "model" first) was analyzed. No significant effect was present. All subsequent analyses were performed without using the ORDER of presentation as a variable.

Test of Recall Accuracy Hypotheses

Data Transformation

Prior to testing the hypotheses, the data to assess differences between actual and recalled feedback were transformed by subtracting what participants actually were told from what they recalled (i.e., wrote on the questionnaire). To aid in interpretation, this difference was divided by 4 (the scale width) and multiplied by 100 to characterize the data as a percentage deviation of recalled feedback. For the data reported in all tables, a positive number indicates that the participant recalled a higher level of performance than the feedback given to them (i.e., over-



recalled). For example, they might have indicated on the questionnaire that their team scored a 3 on a 5-point scale when actually they had been told their team scored a 2. A negative number indicates that the participant recalled a lower level of performance than the feedback given to them (i.e., under-recalled). For example, they might have indicated on the questionnaire that they had individually scored a 2 on a 5-point scale when actually they had been told they had scored a 4.

Analysis

Because participants received feedback on individual as well as on virtual team performance, we created an additional variable (INDIV/TEAM) to study the interaction between levels of recall accuracy for individual and virtual team performance feedback. [While separate analyses for INDIV FEEDBACK (positive and negative) and TEAM FEEDBACK (positive and negative) could have been run, this analysis allowed for a richer exploration of the data.]

As noted above, participants were asked to recall what they had been told at two points in time—immediately following the experiment and one week later. This resulted in a 2 (INDIV FEEDBACK) x 2 (TEAM FEEDBACK) x 2 (INDIV/TEAM) x 2 (TIMING) factorial design with repeated measures on the last factor.

Table 1 displays the ANOVA results for recall accuracy. Results showed nine significant effects ($p < .05$). Table 2 displays the means and simple effects results for INDIV FEEDBACK by TIMING by INDIV/TEAM (A x C x D) and TEAM FEEDBACK by TIMING by INDIV/TEAM (B x C x D). The top half of Table 2 presents the percent difference between what the participant was told about his or her individual and virtual team performance immediately following task completion and one week later (delayed), when individual feedback was positive and negative. The bottom half presents the percent difference between what the participant was told about his or her individual and virtual team performance immediately following task completion and one week later, when virtual team feedback was positive and negative. Percents with the same superscript letters are significantly different from each other. As indicated in the section on Data Transformation, a higher number represents less accurate recall; therefore, the smaller the percent, the more accurate was participants' recall (i.e., .29% recall demonstrates more accurate recall than 8.82%). These results are presented below for each hypothesis.

Table 1 ANOVA Results for Recall Accuracy			
Effect	<u>df</u>	MS	F
	Between subjects		
INDIV FEEDBACK (Pos/Neg) (A)	1		-----
TEAM FEEDBACK (Pos/Neg) (B)	1	1091.3	5.84*
A x B	1		-----
<u>S</u> within-group error	90	(187.00)	
	Within subjects		



INDIV/TEAM (C)	1	2018.08	19.24****
A x C	1	3294.05	31.41****a
B x C	1	991.31	9.45***a
A x B x C	1	923.34	8.80***
C x <u>S</u> within-group error	90	(104.87)	
TIMING (Immed/Delay) (D)	1	237.58	6.84**
A x D	1		-----
B x D	1		-----
A x B x D	1		-----
D x <u>S</u> within-group error	90	(34.75)	
C x D	1	136.8	4.26*
A x C x D	1	240.51	7.49**a
B x C x D	1	268.29	8.36***a
A x B x C x D	1		-----
C x D x <u>S</u> within-group error	90	(32.10)	

Note. Values enclosed in parentheses represent mean square errors.

S = subjects.

^a Refer to Table 2

* p < .05 ** p < .01 *** p < .005 **** p < .000

Ó the Journal of Behavioral and Applied Management – Summer/Fall 2002 – Vol. 4(1) Page 30

Table 2				
Recall Accuracy Percents for INDIV FEEDBACK x TIMING x INDIV/TEAM				
(A x C x D) and TEAM FEEDBACK x TIMING x INDIV/TEAM (B x C x D) Interactions				
	INDIV/TEAM – Indiv (C)		INDIV/TEAM – Team (C)	
	Immediate	Delay	Immediate	Delay
INDIV FEEDBACK (A)				
Negative	3.68% ^{wy}	8.82% ^{wxz}	-3.19% ^y	-2.94% ^z
Positive	0.29%	.29% ^x	1.16%	2.04%
TEAM FEEDBACK (B)				
Negative	2.83%	4.72%	0.71%	3.07% ^b
Positive	1.22% ^{ac}	5.18% ^{ad}	-3.66% ^c	-5.49% ^{bd}

Means with same superscripts are different (p < .05)



H #1. This hypothesis suggested that participants would have greater recall accuracy for individual performance feedback than for virtual team performance feedback. While the overall hypothesis was not supported [i.e., a main effect was not present (Table 1, C)] a closer look at several interaction effects uncovers some interesting results. Significant differences between recall of individual and virtual team feedback existed based on whether feedback was positive or negative. The means in the top half of Table 2 show that in the negative individual feedback condition, a significant difference existed between recall of individual feedback ($\underline{M}$ = 3.68) and recall of team feedback ($\underline{M}$ = -3.19) immediately following feedback (superscript y) and after a delay ($\underline{M}$ = 8.82 compared to $\underline{M}$ = -2.94) (superscript z). The absolute values of these means, however, suggest that recall of individual feedback was less accurate than recall of team feedback, contrary to hypothesis 1.

The means shown in the bottom half of Table 2 indicate that recall accuracy was better for individual feedback than team feedback when team feedback was positive [$\underline{M}$ = 1.22 compared to $\underline{M}$ = -3.66 (superscript c); and $\underline{M}$ = 5.18 compared to $\underline{M}$ = -5.49, superscript d]. Recall of individual performance was more accurate (closer to zero) than recall of team performance, in support of hypothesis 1.

H #2a and 2b. These hypotheses suggested that a one-week delay in asking participants to recall their performance feedback would result in less accurate recall of individual feedback (2a) and of team feedback (2b). Hypothesis 2a was supported, but 2b was not. The main effect was significant (D) as were two interactions with INDIV and INDIV/TEAM (A x C x D), and with TEAM and INDIV/TEAM (B x C x D). Because the interactions subsume the main effect, the main effect and interaction (Table 1) and means (Table 2) are interpreted simultaneously.

As noted in the top half of Table 2, recall of individual feedback was more accurate immediately following feedback than one week later ($\underline{M}$ = 3.68 compared to $\underline{M}$ = 8.82, superscript w), in support of hypothesis 2a. And, individual feedback was less accurate one week later (bottom half of Table 2) when the virtual team received positive feedback ($\underline{M}$ = 1.22 versus $\underline{M}$ = 5.18, superscript a), in support of hypothesis 2a. No differences were found for team feedback (hypothesis 2b).

H #3a and 3b. These hypotheses suggested that participants would have better recall accuracy for positive individual performance and virtual team performance feedback than for negative individual and virtual team performance feedback. Hypothesis 3a was not supported based on the main effect analysis for INDIV FEEDBACK (A). Simple effects tests found that participants were more accurate in their recall of positive than negative individual feedback when recall was delayed ($\underline{M}$ = 0.29 compared to $\underline{M}$ = 8.82, superscript x). This means that when individuals were asked to recall their performance feedback some time later, their recall was less accurate if the performance feedback was negative, providing limited support for hypothesis 3a.

While a main effect for TEAM FEEDBACK (B) (hypothesis 3b) was significant [the means in Table 2 show that one week later participants had more accurate recall for negative (not positive) team feedback ($\underline{M}$ = 3.97 versus $\underline{M}$ = -5.49, superscript b). Hypothesis 3b, therefore, was not supported.



Test of Attribution Hypotheses

An ANOVA was also conducted to determine the effects of INDIV FEEDBACK (positive and negative) (A) and TEAM FEEDBACK (positive and negative) (B) on attributions (refer to Table 3). Participants were asked to make attributions about performance at two points in time—immediately following the experiment and one week later (TIMING) (C). We created a fourth variable [LOCUS (D)] to study the interactions between participants' attributions to themselves (i.e., perceived responsibility for team performance based on the participant's ability and effort) and attributions to the other [hypothetical] team member (i.e., attributing responsibility for team performance to the other virtual team member's ability and effort). Only ability and effort were studied; we did not explore attributions for luck and task. [While separate analyses for LOCUS (self) and LOCUS (other) could have been run, this analysis allowed for a richer exploration of the data.] Thus, the data are analyzed in a 2 (INDIV FEEDBACK) x 2 (TEAM FEEDBACK) x 2 (TIMING) x 2 (LOCUS) factorial design with repeated measures on the third and fourth factors (Table 3).

H #4a, 4b, and 4c. Hypothesis 4a suggested that virtual team members would attribute performance to themselves when given positive individual performance feedback and to others when given negative individual performance feedback. Hypothesis 4b suggested that team members would attribute performance to others when given positive team performance feedback and to themselves when given negative team performance feedback. Hypothesis 4c explored whether a group-serving bias existed for attributions to the team.

Hypothesis 4a was not supported--the INDIV FEEDBACK (A) main effect was not significant, indicating no differences in attributions to self and other when individual feedback was positive or negative (see Table 3). Hypothesis 4b was supported--the TEAM FEEDBACK (B) main effect and interaction between TEAM FEEDBACK and LOCUS (B x D) were significant. Because the interaction subsumes the main effect, the main effect and interaction are interpreted simultaneously. The interaction indicates that attributions for virtual team performance to self or other were dependent upon whether the virtual team performance feedback was positive or negative. Participants gave more responsibility to the other team member when they received positive team feedback than negative team feedback ($\bar{M} = 3.91$ compared to $\bar{M} = 3.34$, superscript a, Table 4). And, participants were more likely to attribute performance to the other team member's ability and effort ($\bar{M} = 3.91$) than to themselves ($\bar{M} = 3.45$) when performance was positive, supporting hypothesis 4b.

Table 3			
ANOVA Results for Attribution—INDIV FEEDBACK x LOCUS Interaction			
Effect	df	MS	F
	Between subjects		
INDIV FEEDBACK (A)	1		
TEAM FEEDBACK (B)	1	9.94	8.50**
S within-group error	90	(1.17)	



	Within subjects		
TIMING (C)	1		5.04*
C x <u>S</u> within-group error	90	0.15	
LOCUS (D)	1	4.69	11.69**
B x D	1	5.43	13.54***
D x <u>S</u> within-group error	90	(0.40)	

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 4 Attribution Means for INDIV x LOCUS (A x D) and TEAM x LOCUS (B x D) Interactions			
	LOCUS		
	Self		Other
INDIV FEEDBACK			
Negative	3.32		3.56
Positive	3.50		3.63
TEAM FEEDBACK			
Negative	3.37		3.34 ^a
Positive	3.45 ^b		3.92 ^{ab}

^{ab} Means with same superscripts are different ($p < .01$).

To examine hypothesis 4c, we combined attributions for self and for other to determine if internal attributions (i.e., the team's ability and effort) for successful performance were made. No differences were found for positive and negative feedback—hypothesis 4c was not supported.

H #5a and 5b. These hypotheses proposed that attributions would be influenced by the time interval between receiving performance feedback and when participants were asked to recall that feedback--immediately upon receiving feedback, participants would make external attributions for individual and team feedback, and after one week, participants would make internal attributions for individual and team feedback. Hypothesis 5a was not supported—means for individual attributions over time were not different. Hypothesis 5b was not supported—even though differences existed over time [TIMING (C) in Table 3), the means were in the opposite direction.

To examine hypothesis 5c, the attributions for self and for other were combined to determine if internal attributions for successful performance were made. The attributions for team provided immediately after feedback ($\bar{M} = 3.45$) were lower than those provided one week later ($\bar{M} = 3.54$) (means are not reported in a table). In other words, as time passed participants increased their attributions to the team.



Discussion

Researchers are beginning to study how virtual teams are different from co-located teams. Existing theory on co-located teams supports the need for systematic and continuous development of individuals and groups into teams to build the internal infrastructure necessary to maintain organizational innovation and continuous improvement (e.g., Romig, 1996). One method to accomplish development is through performance feedback. We chose, therefore, to study recall accuracy and attributions in virtual teams to explore if existing performance appraisal and small group theory applies when team members are not co-located.

Results represent an initial step toward exploring recall accuracy and attributions in virtual teams. We were able to replicate one of five hypotheses about recall accuracy with partial support for two hypotheses. We were able to replicate two of six hypotheses on attributions. We will discuss the confirmation of hypotheses from co-located teams to virtual teams in both recall and attribution theory. Then, we will address our findings regarding the over-recall of individual feedback, under-recall of team feedback, and a “team-centric” bias for attributions. Finally, we will provide recommendations for managers, limitations of the study, and suggestions for future research.

We replicated previous research on co-located teams. Two main conclusions are made about recall accuracy about individual performance. First, participants remembered their individual performance feedback more accurately immediately after receiving feedback, particularly when they had done poorly (superscript w) or their team had done well (superscript a). Second, when participants had done poorly, their recall about their individual performance after a one-week delay was less accurate than when they had been given positive feedback (superscript x) or when compared to team performance recall after one week (superscript z). These findings indicate that recall accuracy of immediate feedback and positive feedback is not altered by the conditions of a virtual team. Anonymity, lack of face-to-face contact, geographical separation, and interdependence with a team member do not dilute the strength of positive feedback given immediately after completion of a task. First, positive feedback is a powerful tool, whether an individual is in a co-located team or a virtual team. Second, forgetting over time occurs regardless of the team setting.

Results regarding predictions about recall accuracy for team performance were somewhat surprising. Recall of negative team feedback was more accurate than positive team feedback (contrary to hypothesis 3b, Table 2, superscript b). Some justification has been provided for improved recall of negative information, including the need to master one's environment or the need to give special attention to negative feedback in order to refute the findings (Donlin, 1990). In conjunction with simple effects results under hypothesis 1 (i.e., recall of team feedback was less accurate than recall of individual feedback when the team did well, Table 2, superscripts c and d), we conclude that team feedback was highly distorted (under-recalled) when the team, in fact, did well. Combined with the mixed results for hypothesis 1 on individual versus team recall, we found a tendency in this study for participants to over-estimate their own performance and under-estimate their team member's performance when asked to recall what had been told to them.



Exploring under- and over-recall further, we note that participants greatly exaggerated their individual performance when, in fact, they had been told their performance was poor. They also exaggerated their [poor] individual performance when the team performance was good. The errors regarding their own poor performance were exacerbated over time—after a delay, participants exaggerated their own performance (positive numbers) and under-estimated team performance (negative numbers). Generally speaking, individual performance was over-inflated and team performance was under-inflated when individuals had done poorly or the team had done well. To our knowledge, this phenomenon has not been addressed in previous research in co-located teams. How can this be explained in the virtual team context? It's likely that anonymity, lack of face-to-face accountability, and lack of team accountability all have contributed to this finding. Recalling stronger individual performance (when actually poor) and weaker team performance (when actually good) appears as an attempt to mediate the differences that actually existed. Could this be an attempt by the individual to take advantage of the good overall team performance?

Understanding that individual level contributions provide the building blocks to successful dyad performance (Wagner & Hollenbeck, 1998), inflation of individual performance levels when performance is actually poor is a serious issue. If individuals believe they are better performers than they actually are, they will not attempt to improve their performance. If their performance doesn't improve, by its very nature, dyad/team performance cannot improve.

Regarding the attribution hypotheses, this study found support for two of six hypotheses. Results regarding differences in attributions under positive or negative feedback conditions supported previous research by Burger and Rodman (1983), Imamoglu (1991), Zaccaro, Peterson and Walker, (1987), but only at the team level (hypothesis 4b). Participants gave the other team member more credit than they gave themselves when the team had done well. And, attributions to the other team member were greater for positive (compared to negative) feedback. This finding replicates research on co-located teams and reflects a bias toward the team. Other evidence of bias toward the team surfaced in (1) the attribution to the other team member after a delay, one that was inconsistent with hypothesis 5b, and (2) the attribution to the team as a whole (combined self and other) after a delay. This finding contributes to the team literature in a unique way. Participants gave more responsibility to the team when they received positive team feedback than negative team feedback. And, participants were more likely to attribute performance to the other team member's ability and effort or to the team as a whole than to themselves when performance was positive. Our findings highlight that participants in this virtual team environment did not exhibit an ego-centric bias for positive performance.

The results for hypotheses 4 and 5 lead us to conclude that virtual team members in this study focused less on taking personal credit for team performance when team feedback was positive and one week after. We are calling this effect a "team-centric" bias. In this study, participants were more likely to attribute good team performance to the entire team (not themselves). This is consistent with group solidarity research in co-located teams (Gergen & Taylor, 1969) and may be similar to Rantilla's (2000) group-serving bias. Revealing a team-centric bias in a virtual team is an interesting phenomenon. Giving credit to the whole team even



when the team member isn't present is unique, and may reflect strong identification with the team (though this study didn't measure such identification) and team accountability.

Recommendations and Implications for Managers

Finding that individual negative and team positive feedback are less accurate is an important result given that organizations may simultaneously want to reward team contributions (over individual contributions) but want to ensure that employees perform well individually. Managers should be concerned also about the potential for employees to recall performance feedback in a way that reduces [perceived] differences between individual and team performance levels. On the one hand, the reward structure (e.g., merit) must emphasize team accomplishments in order to reinforce collective efforts. On the other hand, because successful dyad and team performance is contingent upon successful individual performance (Wagner & Hollenbeck, 1998), managers must ensure that individuals accurately recall their individual performance levels.

To improve recall of effective and ineffective individual performance, managers must collect and provide individual performance data to each team member. They can do this by establishing structured systems and providing cues, such as questioning and re-presenting previous material (Brainerd, Reyna, & Kneer, 1995; Reyna & Titcomb, 1997), to help individuals recall performance feedback (or ensuring that the job itself provides cues). Other research shows that providing more frequent information (e.g., feedback) helps recall (Stasser, Taylor, & Hanna, 1989). Also, managers are not likely to observe individual behaviors in virtual team settings; they will need to rely on structured processes. Cascio (2000) suggests establishing clear individual and team goals, identifying decision processes, and providing for a team development specialist who can facilitate interactions. Co-worker feedback must be relied on more heavily than traditional supervisor evaluation. Care should be given to creating a healthy environment in which feedback is provided—team members must be able to exchange ideas without criticism and solicit feedback from team members on team performance (Knoll & Jarvenpaa, 1998). And, because managers may not be comfortable with their limited input on individual performance, they should consider taking full advantage of 360-degree performance appraisal systems (to ensure multiple forms of input). Managers also should be sensitive to the possibility that virtual team members may be unclear about interpreting their level of performance (Ross & Cousins, 1995). Providing clear statements about expected level of performance and providing an opportunity for virtual team members to ask questions will minimize misunderstanding and improve future performance.

Managers must remember also that lack of change may NOT be due to virtual team members' lack of motivation or desire to change, but to their inability to remember what they had been told, as shown in this study. Methods must be put into place to cue (Lorch & Chen, 1986; Lorch & Lorch, 1996) virtual team members about the feedback that they had received in their previous performance evaluation. These cues might be received directly from the manager as an employee starts a new project (i.e., reminding an individual about expected changes in his or her future performance) or added to the team processes (e.g., statements about individual responsibilities that contribute to successful team outcomes). Managers should also pay particular attention to how the task itself can provide feedback (refer to Hackman & Oldham,



1976 for a review of the job characteristics model). For example, individuals may be able to consult a manual on appropriate policies and procedures, use templates to ensure consistency, or install mechanisms by which performance accuracy can be measured.

When considering the findings about attributions, managers will need to help teams determine if poor virtual team performance is a result of poor individual performance, a result of inadequate team processes (see Henry, Strickland, Yorges, & Ladd, 1996 for a discussion of related material) or due to external circumstances. Providing virtual team members with feedback on virtual team performance without analyzing its causes is insufficient. Improved virtual team performance most likely will occur if the causes of poor performance have been identified appropriately.

Limitations and Suggestions for Future Research

A laboratory study was conducted to determine the causal nature of the relationship between positive and negative feedback, level of feedback (individual versus team), and timing (immediate versus delayed) on recall accuracy and attributions in a virtual team setting. Because of the increased use of virtual teams, additional laboratory studies should be completed. We recommend continued laboratory experimentation to provide for face-to-face contact before beginning the team project (to increase identity with the team), to use a more realistic workplace project, to gather information on larger team interactions as well as dyad interactions, and to provide a context within which to recall individual and team performance feedback (e.g., completing more than one project). Perhaps with additional controls, a more direct application of performance appraisal and team research to the virtual team context will be possible.

The significant findings should be explored next in a field setting to determine external validity. Will recall accuracy of virtual team performance feedback in organizational settings decrease over time? Will positive virtual team performance in organizational settings lead to a group-serving (team-centric) bias in attributions?

Future research should also explore further a simple effect that we uncovered—in the negative individual feedback/positive team feedback condition, why did virtual team members over-recall their individual performance and under-recall their team performance? Finally, future research might vary the information about the causes of virtual team performance that is provided to virtual team members to determine if that information reduces the tendency to engage in the team-centric bias.



References

- Alba, J. W., & Hasher, L. (1983). Is memory schematic? Psychological Bulletin, 93, 203-231.
- Amberg, M., & Zimmerman, F. (1998). Enabling virtual workplaces with advanced workflow systems. In Igarria & Tan (Eds.), The virtual workplace, Hershey, PA: Idea Group Publishing, 2-23.
- Anderson, J. R. (1985). Cognitive Psychology and Its Implications, (2nd ed.). New York: W.H. Freeman and Company.
- Apgar, M. (1998). The alternative workplace: Changing where and how people work. Harvard Business Review, 76(3), 121-136.
- Arkin, R. M., and Maruyama, G. M. (1979). Attribution, affect, and college exam performance. Journal of Educational Psychology, 71, 85-93.
- Belli, R. F., Windschitl, P. D., McCarthy, T. T., & Windfrey, S. E. (1992). Detecting memory impairment with a modified test procedure: Manipulating retention interval with centrally presented event times. Journal of Experimental Psychology: Learning, Memory and Cognition, 18, 356-367.
- Brainerd, C. J., Reyna, V. F., & Kneer, R. (1995). False-recognition reversal: When is similarity distinctive? Journal of Memory and Language, 34, 157-185.
- Burger, J. M., & Rodman, J. L. (1983). Attributions of responsibility for group tasks: The egocentric bias and the actor-observer difference. Journal of Personality and Social Psychology, 45, 1232-1242.
- Cascio, W. F. (2000). Managing a virtual workplace. Academy of Management Executive, 14(3), 81-90.
- Ceci, S. J., & Bruck, J. (1993). Suggestibility of the child witness: A historical review and synthesis. Psychological Bulletin, 1113, 403-439.
- Chandler, C. C. (1993). Accessing related events increases retroactive interference in a matching recognition test. Journal of Experimental Psychology: Learning, Memory and Cognition, 19(4), 967-974.
- Clapham, S. E., & Schwenk, C. R. (1991). Self-serving attributions, managerial cognition, and company performance. Strategic Management Journal, 12, 219-229.



- Deppe, R. K., & Harackiewicz, J. M. (1996). Self-handicapping and intrinsic motivation: Buffering intrinsic motivation from the threat of failure. Journal of Personality & Social Psychology, 70(4), 868-876.
- Donaldson, S. I., & Weiss, R. (1998). Health, well-being, and organizational effectiveness in the virtual workplace. In Igarria & Tan (Eds.), The virtual workplace, Hershey, PA: Idea Group Publishing, 2-23.
- Donlin, J. M. (1990). Memory for performance feedback: A test of three self-motivation theories. Dissertation Abstracts Online, 51 (08B), 4085-4279.
- Dustin, D. S. (1966). Member reactions to team performance. The Journal of Social Psychology, 69, 237-243.
- Feldman, J. M. (1981). Beyond attribution theory: Cognitive processes in performance appraisal. Journal of Applied Psychology, 66, 127-148.
- Forsyth, D., & Kelley, K. N. (1994). Attribution in groups. Small Group Research, 25(3), 367-377.
- Gergen, K. J., & Taylor, M. G. (1969). Social expectancy and self-presentation in a status hierarchy. Journal of Experimental Social Psychology, 5, 79-92.
- Hackman, J., & Oldham, G. (1976). Motivation through the design of work: Test of a theory. Organizational Behavior and Human Performance, 16, 250-279.
- Haxby, J. V., Ungerleider, L. G., Horwitz, B., Rapoport, S. I., & Grady, C. L. (1995). Hemispheric differences in neural systems for face working memory: A PET-rCBF study. Human Brain Mapping, 3, 68-82.
- Hellreigel, D., Slocum, J. W., & Woodman, R. W. (1992). Organizational Behavior, (6th ed.). St. Paul: West Publishing Company.
- Henry, R. A., Strickland, O. J., Yorges, S. L., and Ladd, D. (1996). Helping groups determine their most accurate member: The role of outcome feedback. Journal of Applied Social Psychology, 26(13): 1153-1170.
- Huber, V. L., Podsakoff, P. M., & Todor, W. M. (1986). An investigation of biasing factors in the attribution of subordinates and their supervisors. Journal of Business Research, 14, 83-98.
- Igarria, M. (1998). Managing virtual workplaces and teleworking with information technology. Journal of Management Information Systems, 14(4), 5-6.
- Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on behavior in organizations. Journal of Applied Psychology, 64, 349-371.



- Imamoglu, E. O. (1991). Interpersonal consequences of expressing personal or team affect for team success or failure among Turkish students. Journal of Psychology Interdisciplinary & Applied, 125(5), 509-524.
- Kahai, S. S., Sosik, J. J., Avolio, B. J. (1997). Effects of leadership style and problem structure on work group process and outcomes in an electronic meeting system environment. Personnel Psychology, 50, 121-146.
- Kelley, H. (1967). Attribution theory on social psychology. Nebraska Symposium on Motivation.
- Kimball, L., & Eunice, A. (1999). The virtual team: Strategies to optimizes performance. Health Forum Journal, 42(3), 58-62.
- Knoll, K., & Jarvenpaa, S. L. (1998). Working together in global virtual teams. In Igbaria & Tan (Eds.), The virtual workplace, Hershey, PA: Idea Group Publishing, 2-23.
- Levy, P.E. (1993). Self-appraisal and attributions: A test of a model. Journal of Management, pp. 51-62.
- Levinson, H. (1994). Why the behemoths fell: Psychological roots of corporate failure. American Psychologist, 49, 428-436.
- Lorch, R. F., Jr., and Chen, A. H. (1986). Effects of number signals on reading and recall. Journal of Educational Psychology, 78(4), 263-270.
- Lorch, R. F., Jr., and Lorch, E. P. (1996). Effects of organizational signals on free recall of expository text. Journal of Educational Psychology, 88(1), 38-48.
- Miller, D. T. (1976). Ego involvement and attributions for success and failure. Journal of Personality and Social Psychology, 34, 901-906.
- Murphy, K. R., Gannett, B. A., Herr, B. M., & Chen, J. A. (1986). Effects of subsequent performance on evaluations of previous performance. Journal of Applied Psychology, 71 (3), 427-431.
- Nadler, D. A. (1979). The effects of feedback on task group behavior: A review of the experimental research. Organizational Behavior and Human Performance, 23, 309-338.
- Nisbett, R. E., & Ross, L. (1980). Human Inference: Strategies and Shortcomings of Social Judgment. Englewood Cliffs, NJ: Prentice-Hall.
- Prussia, G. E., & Kinicki, A. J. (1996). A motivational investigation of group effectiveness using social-cognitive theory. Journal of Applied Psychology, 81(2), 187-198.



- Rantilla, A. K. (2000). Collective task responsibility allocation: Revisiting the self-serving bias. Small Group Research, 31(6), 739-766.
- Reyna, V. F., & Brainerd, C. J. (1995). Fuzzy-trace theory: An interim synthesis. Learning and Individual Differences, 7, 1-75.
- Reyna, V. F., & Titcomb, A. L. (1997). Constraints on the suggestibility of eyewitness testimony: A fuzzy-trace theory analysis. In D. G. Payne and F. G. Conrad (Eds.), Intersections in Basic and Applied Memory Research, Hillsdale, NJ: Lawrence Erlbaum Associates, pp. 1157-174.
- Robbins, S. P. (2000). Organizational behavior. Upper Saddle River, New Jersey: Prentice-Hall, Inc.
- Romig, D. A. (1996). Breakthrough teamwork. Chicago: Irwin.
- Rollier, B., & Loui, Y. I. (1998). The mobile workforce: Strategic opportunity, competitive necessity. In Igarria & Tan (Eds.), The virtual workplace, Hershey, PA: Idea Group Publishing, 2-23.
- Ross, J. A., & Cousins, J. B. (1995). Giving and receiving explanations in cooperative learning groups. The Alberta Journal of Educational Research, 41(1), 103-121.
- Ross, M., & Sicoly, F. (1979). Egocentric bias in availability and attribution. Journal of Personality and Social Psychology, 37, 322-336.
- Rubin, D. C., & Wenzel, A. E. (1996). One hundred years of forgetting: A quantitative description of retention. Psychological Review, 103, 734-760.
- Schlenker, B. R., Soraci, S., & McCarthy, B. (1976). Self-esteem and group performance as determinants of egocentric perceptions in cooperative groups. Human Relations, 29, 1163-1187.
- Stasser, G., Taylor, L. A., & Hanna, C. (1989). Information sampling in structured and unstructured discussions of three- and six-person groups. Journal of Personality and Social Psychology, 57, 67-78.
- Sutton, R. I., & Callahan, A. L. (1987). The stigma of bankruptcy: Spoiled organizational image and its management. Academy of Management Journal, 30, 405-436.
- Tang, T. L., & Tang, T. L. (1986). Effects of leadership status and performance feedback on self and other attributions and task performance. Psychological Reports, 59, 999-1006.



- Tanner, J., Sev'er, A., & Ungar, S. (1989). Explaining the steroid scandal: How Toronto students interpret the Ben Johnson case. International Journal of Sport Psychology, 20, 297-308.
- Taylor, S. E., Crocker, J., Fiske, S. T., Sprinzen, M., & Wrinkler, J. (1979). The generalizability of salience effects. Journal of Personality and Social Psychology, 37, 357-368.
- Ó the Journal of Behavioral and Applied Management – Summer/Fall 2002 – Vol. 4(1)
Page 40
- Thompson, W. B. (1998). Metamemory accuracy: Effects of feedback and the stability of individual differences. American Journal of Psychology, 111(1), 33-42.
- Thompson, S. C., & Kelley, H. H. (1981). Judgments of responsibility for activities in close relationships. Journal of Personality and Social Psychology, 41, 469-477.
- Townsend, A. M., DeMarie, S., & Hendrickson, A. R. (1998). Virtual teams: Technology and the workplace of the future. Academy of Management Executive, 12(3), 17-29.
- Townsend, A., Whitman, M. & Hendrickson, A. (1995). Computer support system adds power to group processes. HR Magazine, 40(9), 87-91.
- Ungar, S., & Sev'er, A. (1989). "Say it ain't so, Ben": Attributions for a fallen hero. Social Psychology Quarterly, 52, 207-212.
- Wagner, J.A., & Hollenbeck, J. R. (1998). Organizational Behavior, 3rd ed. Upper Saddle River, New Jersey, Prentice-Hall.
- Warkentin, M. E., Sayeed, L., & Hightower, R. (1997). Virtual teams versus face-to-face teams: An exploratory study of a web-based conference system. Decision Sciences, 28(4), 975-997.
- Weary-Bradley, G. (1978). Self-serving biases in the attribution process: A reexamination of the factor fiction question. Journal of Personality and Social Psychology, 36, 56-71.
- Weiner, B. (1980). Human motivation. New York: Holt, Rinehart and Winston.
- Weiner, B. (1993). On sin versus sickness: A theory of perceived responsibility and social motivation. American Psychologist, 48, 957-965.
- Williams, K. J., DeNisi, A. S., Meglino, B. M., & Cafferty, T. P. (1986). Initial decisions and subsequent performance ratings. Journal of Applied Psychology, 71, (2), 189-195.



- Wyer, S. R., Jr., & Frey, D. (1983). The effects of feedback about self and others on the recall and judgments of feedback-relevant information. Journal of Experimental Social Psychology, 19(6), 540-559.
- Wyer, R. S., Jr., & Srull, T. K. (1986). Human cognition in its social context. Psychological Review, 93, 322-359.
- Zaccaro, S. J., Peterson, C., & Walker, S. (1987). Self-serving attributions for individual and group performance. Social Psychology Quarterly, 50, 257-263.