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Dyadic meta-accuracy and perceived motivational accuracy in academic work groups

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Abstract

Dyadic-meta accuracy is the ability to know what others think of oneself. Previous research found that group members know who likes them, but not who competes against them. We aimed to conceptually replicate this finding and to explore if students in academic groups can correctly evaluate the academic motivations of their peers, which we termed *perceived motivational accuracy*. We found strong dyadic meta-accuracy for liking, but not for competitiveness. We also found no significant association between perceived and actual motivations to learn, or between perceived and actual motivations to earn a grade. These results conceptually replicate previous findings of dyadic meta-accuracy and suggest that students do not demonstrate perceived motivational accuracy, potentially explaining one difficulty in reaching collective group understandings.

Keywords: Dyadic meta-accuracy, Perceived motivational accuracy

Dyadic Meta-Accuracy and Perceived Motivational Accuracy in Academic Work Groups

Groupwork is a common method to complete tasks in many settings. Groupwork in an academic setting is called cooperative learning, and can result in several valuable classroom benefits, including deeper learning due to communication among peers, developed social skills with increased communication, and heightened critical thinking skills from peers challenging each other's views (Shimazoe & Aldrich, 2010). Several theoretical perspectives explain the success of cooperative learning, such as motivational perspectives emphasizing that task motivation results in growth and learning in an educational setting (Slavin, 2014). The drive for a student to complete a task encourages them to work well with group members to ultimately complete the desired task.

Individual cognition also affects both cooperative learning and general groupwork. One cognitive aspect recently investigated is dyadic meta-accuracy, the ability to accurately know what others think of oneself (Eisenkraft, Elfenbein, & Kopelman, 2017). Because group members continually gauge each other in many settings to more effectively address topics (Barry & Stewart, 1997), dyadic meta-accuracy remains a valuable component of group dynamics. Eisenkraft et al. (2017) thus investigated dyadic meta-accuracy for liking and competitiveness in both professional work groups and in academic work groups to evaluate if group members can accurately determine if other group members liked or felt competitive towards them. For example, if Gary likes Sarah, and Sarah believes that Gary likes her, then Sarah has strong dyadic meta-accuracy because her beliefs of how Gary likes her are similar to how Gary actually likes her. Eisenkraft et al. (2017) found that one's perceptions of how others liked oneself were positively associated with how others actually liked oneself, and that one's perceptions of how

competitive others felt towards oneself were not associated with how competitive others actually felt towards oneself.

These findings suggest that individuals possess strong dyadic meta-accuracy for liking, but not competitiveness (Eisenkraft et al., 2017). Group members were more skilled at detecting who liked them as compared to who felt competitive towards them. Although the Pollyanna Principle states that individuals process positive information−such as liking−better than negative information (Matlin & Stang, 1978), Eisenkraft et al. state their findings were most likely explained by reciprocity (2017). In a friendship, feelings of gratitude and liking are often verbally expressed to strengthen the relationship (Aukett, Ritchie, & Mill, 1988), which can improve dyadic meta-accuracy of liking. However, individuals rarely express how they feel competitive towards others, understandably making dyadic meta-accuracy for competitiveness more difficult to attain.

As previously noted, individual motivation also impacts overall group dynamics, and mainly takes two forms: intrinsic and extrinsic. Intrinsic motivation involves a desire to learn and grow while extrinsic motivation involves a desire to achieve a tangible outcome (Ryan & Deci, 2000). Similar to groupwork in an academic environment being called cooperative learning, intrinsic and extrinsic motivations in academic settings are known as academic motivations, and relate to learning-orientation (LO) and grade-orientation (GO; Goldman & Martin, 2014). Students with a LO value intellectual competency and growth, while students with a GO value grades and recognition, although these two orientations are not mutually exclusive (Eison, Pollio & Milton, 1983). LO and GO are typically measured with the Learning-Orientation Grade-Orientation Scale II (LOGO-II; Eison et al., 1983). This scale examines both LO and GO throughout attitudinal and behavioral subscales to holistically view academic motivations.

Correlates of LO include strong academic performance (Page & Alexitch, 2003), communication with instructors (Goldman & Martin, 2014), and emotional stability (Eison, 1982). GO is correlated with poorer study habits, test anxiety, and less participatory learning styles (Eison, 1982). These academic motivations are evident in group dynamics of academic work groups (Slavin, 2014).

Given the cognitive and motivational factors present in group dynamics, the current study aimed to first conceptually replicate the findings of Eisenkraft et al. (2017) with dyadic meta-accuracy of liking and competitiveness, and to explore perceived motivational accuracy in academic work groups, where motivation is contextualized by LO and GO. Although Eisenkraft et al. (2017) further examined dyadic meta-accuracy through reciprocity and self-projection, the current study aims to conceptually replicate how well group members predict likability and competitiveness among peers in academic work groups. Because motivation is pivotal to group performance (Gagné & Deci, 2005), the present study also examined how accurate group members perceived their peers' motivations, as measured by LO and GO, in an academic work setting.

There is an important methodological distinction to note. Eisenkraft et al. (2017) evaluated dyadic meta-accuracy by comparing perceptions to meta-perceptions, which are impressions of what others believe, but we will discuss how we compared perceptions to results from a questionnaire, the LOGO-II (Eison et al., 1983). The LOGO-II was used in the present study to evaluate the extent to which group members were accurate in their perceptions of what motivated their peers, which we term *perceived motivational accuracy*. We believed a more in-depth psychometric approach was necessary to measure LO and GO levels for comparison to a self-report scale that measured group members' perceived LO and GO for their peers.

Comparing self-report responses to results on a measure is a purposeful methodological asymmetry that allowed us to measure perceived motivational accuracy, not dyadic meta-accuracy.

The purpose of this procedure was to determine if group members accurately assess their peers' motivations in academic work groups. This study should help explain some of the personal assessments among group members with liking, competitiveness, and motivation. Several studies have demonstrated that shared understandings among group members aid group processes and performance (Stout, Cannon-Bowers, Salas, & Milanovich, 1999; Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000; Marks, Zaccaro, & Mathieu, 2000). The current work in dyadic meta-accuracy and perceived motivational accuracy, then, should help explain group members' understandings of their peers' motivations, which is valuable given the importance of shared understandings for group performance. The researchers subsequently proposed two hypotheses: (1) results would conceptually replicate findings of Eisenkraft et al. (2017), such that dyadic meta-accuracy will be found for liking but not competitiveness, and (2) group members will demonstrate strong perceived motivational accuracy by accurately evaluating the LO and GO levels of their group members.

Method

Participants

Participants in this study were recruited from a mid-sized, southern university and consisted of 73 undergraduate students (77% women) between the ages of 18 and 43 with a mean age of 21.7 (SD = 3.2). Participants were from four upper-level psychology lab courses which involve a semester-long group research project with two to six members in each group. If participants were in more than one of the labs sampled, they could not participate more than

once, and were not considered part of the subsequent groups. There were 3 two-person groups, 5 three-person groups, 9 four-person groups, 2 five-person groups, and 1 six-person group. The racial composition of participants was 76.7% White/European American, 12.5% Black/African American, 5.5% Asian, 2.8% Latino, and 2.8% other.

Measures

Demographics form. A short demographics questionnaire asked for age, sex, and ethnicity.

Dyadic meta-accuracy questions. To conceptually replicate dyadic meta-accuracy of liking and competitiveness, similar questions used by Eisenkraft et al. (2017) were included. These questions were on a 9-point Likert-type scale ranging from 1 (*not at all*) to 9 (*very much*). An example item is, "How much do you like this group member?" To assess dyadic meta-accuracy, this item would be compared with the following item, which a different group member would answer: "How much does this group member like you?" For competitiveness, questions were "How competitive are you toward this group member?" and would similarly be compared with the following item that a different group member answers: "How much does this group member feel competitive toward you?" Although Eisenkraft et al. (2017) assessed dyadic meta-accuracy using multiple questions and then averaging responses, the present study implemented these four questions for replication purposes because they are part of a conceptual, and not exact, replication.

LOGO-II. The Learning-Orientation Grade-Orientation Scale II (LOGO-II; Eison et al., 1983) was used to measure levels of both LO and GO. This scale contains 32 total questions with two subscales. As previously stated, one subscale measures both attitudinal and behavioral aspects of LO and the other subscale measures both attitudinal and behavioral aspects of GO.

Both attitudinal and behavioral aspects of each subscale are combined to form a holistic representation of LO and GO. Responses are measured on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) for attitudinal items and 1 (*never*) to 5 (*always*) for behavioral items. Scores of each orientation range from 16 to 80, with higher scores indicating higher levels of that academic orientation. Across both attitudinal and behavioral items, inter-item reliability of the LO subscale results in an $\alpha = .76$. Similarly for GO, interitem reliability of the GO subscale results in an $\alpha = .73$. An example LO attitudinal item is, "I find the process of learning new material fun." An example GO behavioral item is, "I will withdraw from an interesting class rather than risk getting a poor grade."

Descriptions of academic orientations. Descriptions of both LO and GO academic orientations were provided so that participants could make an informed estimation of how LO and GO their peers were throughout the perceived motivational accuracy questions. LO students were described as striving "for personal growth, the process of learning, and intellectual competency. They are the ones to ask questions which they find interesting." GO students were described as "focused on grades, status, competition, and recognition. They are the students to ask whether or not material will be on the test." It was also stated that "these orientations are not mutually exclusive; someone can have levels of both orientations."

Perceived motivational accuracy questions. To assess perceived motivational accuracy, two questions were asked using a similar 1 (*not at all*) to 9 (*very much*) Likert-type scale, mirroring the structure of Eisenkraft et al. (2017). These two questions were: "How learning-oriented do you think this group member is?" and "How grade-oriented do you think this group member is?" To evaluate how LO and GO a group perceived its member, all of a group's responses to one individual on these questions were averaged.

Procedure

Before participants were sampled, Institutional Review Board approval was given. After giving informed consent, participants completed the LOGO-II. Participants then read the descriptions of both LO and GO academic motivations. With the understanding of these academic motivations, participants next answered both the dyadic meta-accuracy and perceived motivational accuracy questions of LO and GO, which were presented together in a counterbalanced order. The description of academic motivations was presented after participants took the LOGO-II to limit participant sophistication. Finally, participants completed the short demographics form. When all participants finished, they were thanked for their time and debriefed. The entire study took about 25 minutes and was completed in a quiet room on a university's campus, with 18-24 participants per session. With 73 participants in 20 groups rating each group member, the final data set included 214 dyadic observations for dyadic meta-accuracy. Because responses of all group members' perceived LO and GO levels towards each other were averaged to formulate one estimated LO and GO value that their group perceived, 73 dyadic observations for perceived motivational accuracy were produced. Collection of these data occurred two months into a four-month long group project.

Results

We proposed two hypotheses: (1) results would conceptually replicate findings of Eisenkraft et al. (2017), such that dyadic meta-accuracy will be found for liking but not competitiveness, and (2) group members will demonstrate strong perceived motivational accuracy by accurately evaluating the LO and GO levels of their group members. Regarding the first hypothesis, a Pearson *r* indicated that liking was significantly associated with meta-perceptions of liking, $r(213) = .54$, $p < .001$. Another Pearson *r* found that competitiveness was

significantly associated with meta-perceptions of competitiveness, $r(213) = -.17$, $p = .01$. These results support our first hypothesis because dyadic meta-accuracy was found for liking, but not competitiveness.

To evaluate our second hypothesis, reliability of responses on the LOGO-II was first calculated. Inter-item reliability on the LOGO-II's LO subscale produced $\alpha = .67$. Inter-item reliability of the GO subscale similarly produced $\alpha = .66$. Once inter-item reliability was examined, a Pearson *r* indicated that LO was not significantly associated with perceived LO, $r(71) = .13$, $p = .28$. This was evaluated by comparing total scores on the LOGO-II's LO subscale to responses on the LO perceived motivational accuracy question. Using a Pearson *r* we found that GO was not significantly associated with perceived GO, $r(71) = -.01$, $p = .98$. This was similarly found by comparing total scores on the LOGO-II's GO subscale to responses on the GO perceived motivational accuracy question. These results do not support our second hypothesis because participants' perceptions of others' motivations were not similar to others' actual motivations, thus demonstrating poor perceived motivational accuracy of LO and GO. The overall mean for LO ($M = 52.44$, $SD = 6.94$) and GO ($M = 44.56$, $SD = 7.39$) were similar to previous means (Eison, et al., 1983).

Discussion

The current study's results found that students demonstrate poor perceived motivational accuracy because participants in an academic work environment could not accurately evaluate how LO or GO their group members were. Furthermore, the current study conceptually replicated findings of Eisenkraft et al. (2017) because group members demonstrated strong dyadic meta-accuracy of liking, but not competitiveness. Although Eisenkraft et al. (2017) previously found no significant correlation between competitiveness and perceived

competitiveness, we found a slight negative correlation. A negative correlation in this situation suggests that on average, students' perceptions of how competitive others felt against them were opposite of how competitive others actually felt against them. Even though the correlation we found is negative, it suggests poor dyadic meta-accuracy with competitiveness, which was also found by Eisenkraft et al. (2017). These findings help illuminate the shared understandings present and absent in group dynamics.

There are potential weaknesses within this study. Most notably, the low Cronbach alphas found in the present study for the LOGO-II could explain the lack of perceived motivational accuracy. In a psychometric examination of the LOGO-II, Jacobs (1992) found that despite a low Cronbach alpha for the LO attitudinal items (.29), the LOGO-II's other subscales and overall reliabilities ranged from .58 to .70. Despite the LOGO-II's low LO attitudinal reliability, Jacobs (1992) advocated the continued use of the LOGO-II. The present study's overall Cronbach alphas for the LOGO-II (.67 for LO and .66 for GO) lie within Jacob's reported reliability ranges, suggesting similar reliabilities and approved use of the measure. Another possible weakness is response bias or a faking good response. Because the present study utilized self-report of group members, participants could feel uncomfortable discussing how much they liked, or did not like, their group members, and could subsequently change answers to appear more socially acceptable.

Similarly, impression management could have partially masked the processes that this study examined, especially dyadic meta-accuracy with competitiveness. Impression management involves controlling the perceptions others have about oneself (Leary & Kowalski, 1990). Not many people want others to perceive competition, so impression management could have clouded valid judgements of competitiveness among group members. As an additional limitation,

the two months spent together in groups could be too short of a time for group members to fully and accurately learn about one another, thus negatively impacting both dyadic meta-accuracy and perceived motivational accuracy. Lastly, generalizability to other populations may be inhibited due to these groups having a collective academic goal. Shared goals help unify group members (Shteynberg & Galinsky, 2011), and perhaps these findings do not apply to group scenarios where there is no overarching mission to accomplish.

Despite these limitations, this study successfully replicated results of Eisenkraft et al. (2017) on a conceptual level, thus giving greater credibility to the experimental design of both studies. Group members may be able to know who likes them, but not who competes against them. The present study also found that students in an academic work environment demonstrated poor perceived motivational accuracy with LO and GO; group members were not found to accurately assess whether learning or grades motivated their peers in academic groups. Because dyadic meta-accuracy and perceived motivational accuracy offer cognitive explanations of how group members interact with and perceive one another (Elfenbein, Eisenkraft, & Ding, 2009), these findings describe the accuracy of beliefs that group members have towards each other. With the popularity of groupwork and cooperative learning in academic settings, these findings help clarify some of these perceptual processes active in group dynamics.

Previous research demonstrates the difficulties of evaluating others' behavioral contributions to groupwork (Weisband & Altwater, 1999). Considering the current study's findings, it appears similarly challenging to accurately evaluate other group members' unseen motivations, which ultimately lead to behavioral contributions in groups. Future research can examine methods to make group members aware of each other's motivations, and if that specific kind of understanding leads to improved group cohesion and productivity. Furthermore, because

collectivist cultures maintain a stronger emphasis on connectedness and group dynamics (Markus & Kitayama, 1991), future research should evaluate if collectivist cultures retain higher perceived motivational accuracy than individualistic cultures.

In conclusion, we found that students demonstrated poor perceived motivational accuracy of LO and GO in an academic work setting and conceptually replicated results of Eisenkraft et al. (2017) on dyadic meta-accuracy of liking and competitiveness. Because differences among values that members have in groups often lead to conflict (Jehn, Northcraft, & Neale, 1999), the lack of perceived motivational accuracy could explain issues in groups such as miscommunication of assumptions, conflicts regarding how to solve problems, and loss of cohesion due to differing priorities. This study's finding that group members do not know what motivates their peers is valuable because this lack of understanding may contribute to poorer group dynamics. Future research in perceived motivational accuracy could offer valuable benefits to cooperative learning in academic work environments and general group dynamics such as increased synchrony, harmony, and productivity, and thus remains a meaningful area of investigation.

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Table I.
Descriptive Statistics and Bivariate Correlations of Dyadic Meta-Accuracy

Variable	*M*	*SD*	Correlations 1	2	3
1. A's meta-perception of how much B likes A	6.8	1.6			
2. How much B likes A	7.2	1.8	0.543***		
3. A's meta-perception of how competitive B is to A	3.1	1.9	-0.021	-0.070	
4. How competitive B is to A	3.1	2.2	0.104	0.071	-0.173*

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

Table II.
Descriptive Statistics and Bivariate Correlations of Perceived Motivational Accuracy

Variable	*M*	*SD*	Correlations 1	2	3
1. LO score	52.4	6.9			
2. How LO group members perceived this person	6.5	1.2	0.129		
3. GO score	44.6	7.4	-0.503***	0.002	
4. How GO group members perceived this person	7.0	0.9	-0.086	0.431***	-0.012

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