

## Hope as a Predictor of Performance of Graduate-Level Cooperative Groups in Research Methodology Courses

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This study investigated the extent that cooperative group members' levels of hopefulness, operationalized as a combination of pathways to meet desired goals and the agentic thinking that motivates an individual to use those pathways, predict (a) group performance, namely, the quality of an article critique assignment and research proposal assignment, and (b) the degree that heterogeneity (i.e., variability of pathways and agency levels) is related to this outcome variable. Participants were 86 graduate students enrolled in a research methodology course. Groups ( $n = 28$ ) formed the unit of analysis. A multiple regression analysis revealed that groups attaining the lowest scores on the article critique and research proposal assignments combined tended to report the lowest levels of hope, as measured by agentic thinking, and the greatest variation with respect to pathways to meet desired goals. These variables explained 20.5% of the variance in performance. This finding is placed within the context of other studies in which the predictability of group characteristics and dynamics has been examined.

Cooperative learning is an instructional method that provides opportunities for students to maximize their own learning and the learning of their group members (D. W. Johnson & R. T. Johnson, 1993; D. W. Johnson & F. P. Johnson, 2002). This instructional method is not only used widely in primary and secondary education settings, but also has become popularized in college settings, including graduate-level classrooms (Collins, Onwuegbuzie, & Jiao, *in press*). However, according to Collins, Onwuegbuzie, and DaRos-Voseles (2004), "although cooperative learning techniques are utilized at the college level in graduate- level courses, evaluative studies have not been conducted at this level to the same degree that evaluation has occurred at the primary and secondary levels" (p. 147). Thus, research can play an important role in helping instructors of graduate students determine the maximum conditions under which cooperative learning groups perform.

The degree that group members' personality characteristics impact group achievement within cooperative settings represents a research area with much potential (Collins et al., *in press*; D. W. Johnson & F. P. Johnson, 2002). The goal of the present investigation was to examine the personality variable, hope, as a predictor of performance of groups engaged in cooperative learning in the context of a graduate-level research methodology course. Hope has been related empirically to academic achievement, graduation rates, and sport achievement in college and to psychological variables such as life satisfaction and adaptive coping (Bailey, Eng, Frisch, & Snyder, 2007; Curry, Snyder, Cook, Ruby, & Rehm, 1997; Onwuegbuzie & Snyder, 2000; Snyder, 2002; Snyder, Shorey,

Cheavens, Pulvers, & Adams, 2002). However, as related to college students, studies only have focused on the effect of hope on the educational outcomes of *individual* students. However, to date, no researcher has investigated the role of hope on educational outcomes among graduate students working in cooperative learning *groups*. As such, the present investigation, which examined the role of hope in predicting the performance of graduate-level groups in research methodology courses, was unique.

### Cooperative Learning and Group Characteristics

The formative base of cooperative learning, namely, the interrelationship among theory, research, and applications in practice (D. W. Johnson, R. T. Johnson, & K. Smith, 2007; D. W. Johnson & R. T. Johnson, 2009), has been a significant factor contributing to the popularity of cooperative learning in educational and professional settings. A meta-analysis of cooperative learning studies implemented at the post-secondary level was conducted by D. W. Johnson and R. T. Johnson (1993). Collectively, their results led to the identification of five reasons supporting the use of cooperative learning in college settings. First, cooperative learning affects many facets of instruction and outcomes. Second, cooperative learning provides distinctly different learning opportunities that do not exist when students work individually or competitively. Third, cooperative learning has a productive and lengthy history of theory-driven, research-based, and practice-based applications—for example, according to D. W. Johnson and R. T. Johnson (2009), "More than 1,200 research studies have been conducted in the past 11 decades comparing cooperative, competitive, and individualistic

Table 1  
Proportion of Variance Explained in Group Performance  
by Each Personality Variable Across Studies

Variable	Proportion of Variance Explained
Procrastination level associated with task aversiveness	32.5
Individualism	30.3
Procrastination associated with performing administrative tasks	26.4
Perceived self-worth	23.6
Within-group variability in other-oriented perfectionism	21.0
Within-group variability in perceived social acceptability	14.9
Within-group variability in research anxiety	13.2
Procrastination associated with writing a term paper	11.8
Within-group variability in perceived scholastic competence	10.9
Within-group variability in perceived humor	10.1
Perceived job competence	9.8
Procrastination associated with keeping up with weekly reading assignments	8.8
Other-oriented perfectionism	8.0
Perceived creativity	6.5
Within-group variability in self-oriented perfectionism	5.7
Within-group variability in socially prescribed perfectionism	4.9
Socially prescribed perfectionism	2.3

efforts" (p. 365). Fourth, much is known about the essentials that make it work. And fifth, extant research on cooperative learning has produced results with levels of validity and generalizability that have been found infrequently in the field of education (D. W. Johnson & R. T. Johnson, 2009). As noted by D. W. Johnson and R. T. Johnson (2009), "Few instructional practices have been more successfully implemented in the past 60 years than cooperative learning" (p. 365).

At the graduate level, researchers have conducted a series of studies to assess the degree to which personality traits impact group performance and have found that students' levels of perfectionism, individualism, procrastination, self-perception, and anxiety are predictors of group outcomes within research methodology courses (Collins et al., 2004; DaRos-Vosleses, Onwuegbuzie, & Collins, 2003; DaRos-Vosleses, Collins, & Onwuegbuzie, 2005, 2006; Onwuegbuzie & Collins, 2002).

More recently, DaRos-Vosleses et al. (2006) explored the effect of self-perception on performance of graduate-level cooperative groups. Results indicated that cooperative learning groups attaining the lowest article critique scores (performance outcome variable) tended to report the lowest levels of perceived job competence and perceived self-worth, the highest levels of perceived creativity, the greatest variation with respect to perceived scholastic competence and perceived humor, and the least variation with respect to perceived social acceptability. These variables explained 75.8% of the variance in performance. This reported finding represents an extremely large effect size (Cohen, 1988). Table 1 documents the proportion of variance in graduate students' group outcomes as explained by personality variables found to be significant predictors in the extant literature. Cumulatively, these results support the

importance of personality variables upon graduate students' levels of performance while engaged in cooperative learning group processes.

### Hope as a Personality Variable

Snyder and colleagues have conceptualized hope as comprising two dimensions: pathways and agency (Snyder, 2000, 2002; Snyder et al., 1991). Pathways pertain to an individual's self-perception that effective plans, namely, pathways, may be implemented to meet desired goals. Agentic thinking refers to the individual's self-perception that he or she has the ability to use those pathways to achieve a goal (Snyder et al., 1991). Indeed, hope is a variable that impacts an individual's thinking (e.g., goals, ambitions, expectations) and self-regulatory processes, thereby influencing potential outcomes in terms of pursuing short- and long-term goals (Aspinwall, 2006).

Hope also has been studied in the context of group processes in family studies (Tuttle, Knudson-Martin, Levin, Taylor, & Andrews, 2007), in counseling psychology (Baker & Sheldon, 2007; Chang & Banks, 2007; Couch & Childers, 1987; Kleinberg, 2007; Laitinen, Ettorre, & Sutton, 2007; Menzies, 2001; Ripley & Worthington, 2002), in nursing and health science (Cook, Phillips, & Sadler, 2005; Gray, Fitch, Davis, & Phillips, 1997), and in group dynamic studies (Marmarosh, Holtz, & Schottenhamer, 2005). Rather than studying how hope as an individual variable affects the performance of the individual in a group, some of these studies focus the effect of *group-level* hope or *group-derived* hope on the entire group performance. Groups that are found to be hope-stimulating have a *shared sense of efficacy*, and a *collective capacity* to find reasonable solutions to problems (Kleinberg, 2007), whereas groups

that are lacking these traits are deemed to be hope-inhibiting (Kleinberg, 2007).

In the field of education, researchers have shown a positive relationship between college students' levels of hopefulness and their grade point averages (Chang, 1998; Curry et al., 1997). In graduate-level research methodology courses, students' levels of hopefulness have been found to impact variables that relate to achievement levels (Alexander & Onwuegbuzie, 2007; Onwuegbuzie, 1998; Onwuegbuzie & Snyder, 2000). Onwuegbuzie (1998) documented an inverse relationship between graduate students' levels of hopefulness and their levels of anxiety. Onwuegbuzie and Snyder (2000) found that graduate students' levels of hopefulness are associated with their choices of examination-taking coping strategies and use of maladaptive study habits. More recently, Alexander and Onwuegbuzie (2007) investigated the relationship between graduate students' levels of hopefulness and academic procrastination. Results indicated that graduate students' levels of hopefulness assisted in predicting their levels of academic procrastination—specifically, in terms of fear of failure that was operationalized as comprising evaluation anxiety, low self-confidence, and inflated perfectionistic standards (Solomon & Rothblum, 1984). Cumulatively, these results indicate that hope is a personality variable that appears to have potential towards elevating our understanding of group dynamics within the context of cooperative learning.

### Purpose of Study

This study is part of a series of studies examining the impact of group characteristics upon achievement levels of graduate students engaged in cooperative learning within research methodology courses (i.e., Collins et al., 2004; DaRos-Voseles et al., 2003, 2005, 2006; Onwuegbuzie & Collins, 2002). This study's specific purpose was to examine whether cooperative group performance is predicted by (a) the extent to which cooperative group members' levels of hope (i.e., pathways and agency) predict group outcomes in terms of performance within a graduate-level research methodology course, and (b) the degree of heterogeneity (i.e., group members' variability of pathways and agency).

### Method

#### Participants

Participants were graduate students from a number of educationally (e.g., special education, educational leadership) and psychologically (e.g., psychology, school psychology) based disciplines,

who were enrolled in four sections of an introductory-level research methodology course at a midsouthern university. These students ( $n = 86$ ) formed 28 groups ranging in size from 2 to 7 ( $M = 3.32$ ,  $SD = 1.07$ ). To minimize any *implementation threat* to the internal validity of the findings stemming from *differential selection of instructors* (Onwuegbuzie, 2003), the same instructor taught all sections of the research methodology course. The majority of participants were women (85%) and White (94.5%), with most of the remaining participants being African American (4.8%). The participants ranged in age from 21 to 59 years ( $M = 30.1$ ,  $SD = 8.0$ ). The mean grade point average was 3.65 ( $SD = 0.37$ ).

#### Setting

The introductory-level research methodology course was a requirement for all graduate students enrolled in educational degree programs at the institution where the study took place. The semester-long (i.e., 16-week) research methodology course involved classes that were held once per week for 3 hours. Because all classes were held at the same time in the evening (i.e., 5 pm to 8 pm), any *implementation threat* to internal validity resulting from *differential time of day* was minimized (Onwuegbuzie, 2003).

#### Formation of Cooperative Learning Groups

On the first day of class, each student was asked to introduce herself/himself to the class, providing information about her/his degree program, educational attainments and aspirations, current professional status, interests, and place of living. Students then were asked to form base groups comprising 3 to 6 students. Students were asked to form groups based upon shared professional backgrounds and/or proximity to each other's homes. This form of grouping is recommended by D. W. Johnson and F. P. Johnson (2002) who advocate assigning groups randomly by dividing the class by the size of the group desired and asking students to form groups by preferences rather than by measures of ability (e.g., grade point average) or aptitude as measured by scores on an aptitude questionnaire. As noted by D. W. Johnson and F. P. Johnson (2002), students who self-select group members tend to produce more homogeneous groups in contrast to the instructor assigning students to a group. Consequently, the group assignment criteria in this study reflected a *modified stratified random assignment* (D. W. Johnson & F. P. Johnson, 2002).

### Cooperative Group Assignments

A major course requirement that was undertaken via cooperative learning groups involved a detailed written critical evaluation of a published research report (i.e., article critique). The purpose of the article critique was to provide an opportunity for students to develop skills in evaluating published research articles utilizing principles of the scientific method. The other major course requirement that was undertaken via cooperative learning groups involved the completion of a research proposal. The goal of this proposal was to prepare students thoroughly to be able to write proposals for theses and dissertations and to seek external funding. Each base group undertook one article critique and one research proposal.

### Instruments

The literature indicates that the construct of hope has been measured in many different ways depending upon the type of research (i.e., qualitative, quantitative, or mixed) and disciplinary area. In mental health and counseling psychology, for example, hope could be one of the themes identified through analysis of the transcripts of the taped sessions from semi-structured interviews in qualitative-oriented research (Laitinen et al., 2007; Gray et al., 1997; Tuttle et al., 2007). Hope also has been measured indirectly through related scales, such as the Collective Self-Esteem Scale (CSES; Luhitanen & Crocker, 1992) and Dyadic Adjustment Scale (DAS; Spanier, 1976) in some quantitative-oriented studies (Marmarosh et al., 2005; Ripley & Worthington, 2002). However, the only instrument that was specifically developed based on the college population and was widely used in studies in higher education was the Hope scale, which was developed by Snyder et al. (1991). Therefore, in this study, the Hope Scale was used to measure the construct of hope among graduate students.

The Hope scale contains 12 items, of which 4 are fillers. The remaining eight items consist of four Agency items and four Pathways items. According to Snyder et al. (1991), the Agency items tap the sense of successful determination with respect to the individuals' goals. The Pathways items refer to individuals' cognitive appraisals of their ability to overcome goal-related obstacles and to reach their goals. Snyder et al. (1991) reported score (alpha) reliability coefficients ranging from .71 to .76 for the Agency subscale, and from .63 to .80 for the Pathways subscale. A principal components factor analysis with oblique rotations conducted by Snyder et al. (1991) yielded two distinct factors, Agency and Pathways, providing evidence of construct-related validity. For the current study, the score reliability estimates of the Hope

subscale were .66 (95% CI = .53, .76) for pathways and .79 (95% CI = .71, .85) for agency.

### Article Critique

The instructor of the course, a full professor with 13 years of experience teaching research methodology courses to graduate students, utilized rubrics to evaluate students' levels of performance. The professor was the single evaluator of the students' performance. The professor utilized three detailed rubrics to evaluate the article critique. These rubrics, which were originally developed by Wilson and Onwuegbuzie (1999) and updated by Onwuegbuzie (2009), were selected not only because they drew on best practices (e.g., American Educational Research Association [AERA] Task Force on Reporting of Research Methods in AERA Publications, 2006; Choudhuri, Glauser, & Peregoy, 2004; Leech & Onwuegbuzie, 2010; Zientek, Capraro, & Capraro, 2008) and contain numerous items that facilitate comprehensive and rigorous evaluations, but also because they allowed students to apply scoring criteria to their own works, as well as to works of their peers (e.g., cooperative leaning group members), so that they can learn how their ratings compare to those of their instructors (see also, Onwuegbuzie & Leech, 2003). Specifically, three rubrics were used to evaluate the article critique, each comprising a 5-point Likert-format scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). That is, the instructor scored each item depending on the extent to which the element of the article critique indexed by that item (e.g., "The research design is identified accurately") was completely and accurately presented, with a neutral response indicating that the element was presented in a borderline manner. The first rubric contains 35 items, which provides a score for the summary of the selected research article, with scores ranging from 35 to 175. The second rubric assesses how accurately the 150-item reviewer checklist is completed, with scores ranging from 150 to 750. The third rubric contains 50 items that evaluate all components of the critique section, assessing the narrative for the critique section of the article, with scores ranging from 50 to 300. Group scores obtained from the three rubrics were aggregated and converted into a 100-point scale using the following weighting scheme: 35% for the summary rubric, 25% for the reviewer checklist, and 40% for the critique narrative. For the present sample, the score reliability estimates pertaining to the three article critique rubrics were .80 (95% CI = .72, .87) for the 35-item rubric scoring the summary of the selected research article, .84 (95% CI = .78, .89) for the 150-item reviewer checklist accuracy rubric, and .82 (95% CI = .74, .88) for the 50-item rubric assessing the narrative for the critique section of the article.

### Research Proposal

Two rubrics were used for the research proposal assignment. The first rubric consisted of a 5-point Likert-format scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) that was designed to provide a score for the content of the research proposal. This rubric contains 145 items that evaluate the content of the research proposal (i.e., summary, introduction, literature review, method, analysis, reference list, appendix) such that scores range from 145 to 725. The second rubric, also comprising a 5-point Likert-format scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree), assesses the extent to which the research proposal does not contain grammatical and typographical errors and follows the guidelines of the *Publication Manual of the American Psychological Association* (APA, 2001). As with the article critique rubrics, for the research proposal rubrics, the instructor scored each item depending on the extent to which the element of the research proposal indexed by that item (e.g., "If a sample will be selected, the sampling scheme is described clearly and accurately") was completely and accurately presented, with a neutral response indicating that the element was presented in a borderline manner. This rubric contained 89 items and the scores range from 89 to 445. Scores from both rubrics were converted into percentages. From these percentages, a final score was derived using the following weighting scheme: 60% for the content rubric and 40% for the writing style rubric. Thus, each proposal received a group score on a 100-point scale. For the current investigation, the score reliability estimates pertaining to the two research proposal rubrics were .84 (95% CI = .80, .87) for the 145-item rubric evaluating the content of the research proposal and .86 (95% CI = .81, .89) for the 89-item rubric assessing grammatical, typographical, and APA errors.

### Analysis

For each group, the mean and standard deviations pertaining to students' scores on the Hope subscales were computed. This generated four sets of group scores that were used as the units of analysis, rather than individual scores, to decrease the possibility of the statistical independence assumption being violated and systematic error being created (McMillan, 1999). In addition, the group article critique scores and research proposal scores were averaged to yield an overall group performance score that presented a 100-point scale.

The major analysis undertaken in the present study involved the use of multiple regression. An *all possible subsets* (APS) multiple regression (Onwuegbuzie & Daniel, 2003; Thompson 1995) was used to identify an optimal combination of hope

variables (i.e., independent variables) that predicted the group performance score (i.e., combined article critique and research proposal score). Specifically, the means and standard deviations pertaining to the pathways and agency subscale scores served as independent variables, whereas the group performance score served as the dependent variable.

### Results

Table 2 presents the means and standard deviations pertaining to the group-based hope characteristics and performance score. With respect to the Hope Scale, Snyder (1994) reported that a score of 24 approximated high hope. For the present sample, the mean score for the total hope scale was 26.05. This suggests that the majority of participants thought in ways that were very hopeful. Table 3 presents the intercorrelations among the four hope variables. It can be seen from this table that after applying the Bonferroni adjustment, only the correlation between the mean agency score and mean pathways score was statistically significant,  $r = .75$ ,  $p < .0001$ . Cohen (1988) has recommended that correlations of .50 or greater reflect large effect sizes. Thus, using Cohen's (1988) criteria, this correlation coefficient represents a very large effect size, suggesting that, to a very large extent, groups reporting the highest levels of agentic thinking also tended to report the highest levels of pathways to meet desired goals.

Table 2  
Means and Standard Deviations of Hope Subscales

Measure	<i>M</i>	<i>SD</i>
Mean Agency Score	13.40	1.33
Within-Group Variability in Agency Score	1.42	0.77
Mean Pathways Score	12.65	1.32
Within-Group Variability in Pathways Score	1.31	0.66
Group Achievement Score	86.68	8.88

Table 3  
Intercorrelations Among Measures

Measure	1	2	3
1. Mean Agency Score			
2. Within-Group Variability in Agency Score	-.07		
3. Mean Pathways Score	.75*	.04	
4. Within-Group Variability in Pathways Score	.47	.06	.30

\*Statistically significant after applying the Bonferroni adjustment

The Shapiro-Wilk test (Shapiro & Wilk, 1965; Shapiro, Wilk, & Chen, 1968) did not indicate that the distribution of group performance scores was non-normal ( $W = .98$ ,  $p > .05$ ), thereby justifying the use of

multiple regression. In addition, evaluation of assumptions of linearity and homogeneity indicated no threat to multiple regression analysis.

The APS multiple regression analysis revealed that the following two variables contributed statistically significantly ( $F[2, 25] = 3.21, p < .05$ ) to the prediction of group performance score: mean agency score and within-group variability in pathways score. These results indicate that the groups attaining the lowest levels of performance tended to report the lowest levels of agentic thinking and the greatest variation with respect to pathways to meet desired goals. Mean agency score explained by far the most variance in group performance scores, accounting for 17.5% of the variance. Within-group variability in pathways explained an additional 3.0% of the variance. Thus, these two variables combined explained 20.5% of the variance in the performance of the cooperative groups.

An examination of the studentized residuals generated from the model (Myers, 1986) suggested that the assumptions of normality, linearity, and homoscedasticity were met. Using the Bonferroni adjustment, none of the studentized residuals suggested that outliers were present. Further, an examination of the structure coefficients, using a cutoff correlation of 0.3 recommended by Lambert and Durand (1975) as an acceptable minimum coefficient value, suggested that both the mean agency score and within-group variability in pathways score made important contributions to the selected regression model. The fact that both the standardized and structure coefficients pertaining to all variables were noteworthy indicates that none of these constructs acted as suppressor variables (Thompson, 1998; Thompson & Borello, 1985).

## Discussion

The purpose of this study was to examine the role of hope in predicting performance of cooperative learning groups in graduate-level research methodology courses. Findings indicated that both components of hope—pathways to meet desired goals and the agentic thinking that motivates an individual to use those pathways—play a role in predicting the group product (i.e., quality of article critique and proposal combined). However, these two variables predict the group outcome in different ways. Specifically, whereas the *mean* agency score predicted the quality of the article critique and research proposal combined, the within-group *variability* in pathways score—rather than the mean pathways score—predicted the level of group performance as measured by the quality of the article critique and the research proposal. More specifically, groups attaining the lowest levels of performance tended to report the

lowest levels of agentic thinking and the greatest variation with respect to pathways to meet desired goals.

The relationship found in the present study between hope and group performance in a graduate-level research methods course emerged despite the fact that the majority of students thought in ways that were very hopeful. Indeed, it is possible that this relationship would have been even stronger if (a) a greater proportion of the graduate students thought in less hopeful ways and (b) the graduate students were more heterogeneous with respect to their levels of hope because statistical power typically is enhanced by greater variability (Cohen, 1988). Thus, future researchers in this area might consider examining the role that hope plays in influencing cooperative group outcomes among students who do not think in ways that were as hopeful as were the participants in the present sample. Of the two hope variables that predicted group performance, agentic thinking that motivates an individual to use those pathways to attain an outcome or meet a goal was by far the best predictor, explaining 17.5% of the variance in performance. In the current investigation, the effect size (i.e.,  $R^2$ ) pertaining to the hope variables of pathways (3.0%) and agentic thinking (17.5%) combined (20.5%) is larger than some of the effect sizes reported for other predictors of group outcomes in the literature: anxiety ( $R^2 = 13.2\%$ ; Collins et al., 2004) and peer orientation ( $R^2 = 1.8\%$ , Hancock, 2004;  $R^2 = 2.6\%$ , Onwuegbuzie, 2001). Indeed, the proportion of variance explained by the two hope variables represents a moderate-to-large effect size (Cohen, 1988), which suggests that hope plays an important role in the cooperative learning group process. To illustrate these current findings in the context of earlier studies, of the 19 personality variables assessed in the studies that have been conducted to date (i.e., Collins et al., 2004, DaRos-Voseles et al., 2003, 2005, 2006; Onwuegbuzie & Collins, 2002), agentic thinking explains the sixth highest proportion of variance in group achievement.

Although, the majority of students were hopeful, results indicate that the groups containing students with the lowest levels of agentic thinking (i.e., self-determination to utilize pathways to attain a goal) tended to achieve the lowest levels of performance. Therefore, it is plausible that the current finding that groups containing students with the lowest levels of agentic thinking—one component comprising the construct of hope—tended to achieve the lowest levels of performance might have arisen because these students were more likely to have higher levels of anxiety given the complexity of the assignment and the context, namely, a research methodology course. Indeed, low levels of hope have been found to predict high levels of anxiety among graduate students enrolled

in statistics courses (Onwuegbuzie, 1998), as well as being associated with maladaptive studying and examination-taking coping strategies (Onwuegbuzie & Snyder, 2000). In an earlier study, Collins et al. (2004) found that groups attaining the lowest scores on an article critique assignment tended to report the highest levels of anxiety and to be the most heterogeneous with respect to research anxiety. Further, students with low levels of hope have been found to utilize more disengagement coping strategies, such as problem avoidance, when faced with stressful academic situations (Chang, 1998). Thus, the relationship between hope and anxiety should be a topic for future research.

New evidence supporting the relationship between hope and academic procrastination was found by Alexander and Onwuegbuzie (2007) pertaining to the impact of hope upon students' reading and writing — two of the most important features of critiquing a research article and writing a research proposal—the two assignments studied in the present investigation. Specifically, these researchers observed that students who exhibited lower levels of hope were more likely to procrastinate on the three tasks of writing term papers, studying for examinations, and reading weekly assignments than were those students with higher hope scores. The relationship between hope and levels of procrastination on these three tasks likely can be explained with respect to Folkman, Lazarus, Dunkel-Schetter, DeLongis, and Gruen's (1986) findings that planful problem solving (or "ways") and positive reappraisal of events (suggestive of "will", i.e., being determined to think about positive rather than negative issues) are associated both with improvements in positive affect and satisfactory outcomes. Another pertinent finding is that of DaRos-Voseles et al. (2005), who documented that cooperative groups that attained the highest levels of academic procrastination due to task aversiveness tended to be those with the lowest levels of performance on the article critique. Further, groups with the lowest levels of achievement tended to be those containing graduate students who reported procrastinating the most frequently on the following three academic tasks: keeping up with weekly reading assignments, writing a term paper, and performing administrative tasks. It appears that hope and academic procrastination are inextricably intertwined in determining achievement among cooperative learning groups.

As in all studies, threats to internal and external validity of the findings prevail. With respect to internal validity, it should be noted that the score reliability coefficient for the pathways subscale of the Hope scale was somewhat low (i.e., .66). Yet, despite this relative low score reliability coefficient, this subscale still yielded a statistically significant finding—that the

variability in pathways was a statistically significant predictor of the group performance score. However, because score reliability positively affects statistical power (Onwuegbuzie & Daniel, 2004), it is possible that a higher score reliability estimate for the pathways subscale would have increased the effect size pertaining to this variable beyond the 3.0% variance explained found in the present study. Notwithstanding, replications of this study are needed using different measures of hope to assess the reliability of this finding.

Another threat to internal validity stems from the variation in group sizes (i.e., 2 to 7). Indeed, Onwuegbuzie, Collins, and Elbedour (2003) found a relationship between group size and group performance on the article critique. However, it should be noted that the majority of groups (i.e., 75.3%) contained between 3 and 5 participants, explaining why the standard deviation pertaining to group size was relatively small (i.e., 1.07). Thus, it is possible that the potential negative impact of group size variation was minimal.

With respect to external validity, it is not clear how generalizable these findings are across gender and ethnicity, given that the participants were predominantly female and White. Thus, it is possible that the current results do not generalize to male graduate students and to graduate students representing other ethnicities. Indeed, Onwuegbuzie (1999) documented ethnic differences in performance in research methodology courses. As such, more research in this area is needed using a larger sample of males and other ethnic and racial groups.

Despite these limitations, the findings of the present investigation contribute to the literature pertaining to the cooperative learning processes and further validate the construct of hope as a mediating factor impacting the experiences of college students. Thus, as recommended by Collins et al. (in press), future research should investigate simultaneously the role that hope and other personality variables play in the cooperative learning group process. Indeed, studies utilizing mixed research techniques will provide a broader perspective of the group dynamics within cooperating learning settings.

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