**Task Performance in Small Group Settings: The Role of Self-Efficacy, Collective Efficacy, and Group Characteristics**

Jerrine Z. N. Khong

*Independent Researcher*

Gregory Arief D. Liem

*Nanyang Technological University*

Robert M. Klassen

*University of York*

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Requests for further information about this investigation can be addressed to Associate Professor Gregory Arief D. Liem, Psychological Studies Academic Group, National Institute of Education (NIE), SINGAPORE, 637616. E-Mail: gregory.liem@nie.edu.sg. Phone: +65 6219 6045. Fax: +65 6896 9410.

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Abstract

The present study extends the literature by investigating the relative salience of self- and collective efficacy in predicting group performance among early adolescents in Indonesia. A total of 435 early adolescents (mean age 11.70 years, 53% female) were randomly assigned to groups of three to four and completed three group tasks (task 1: puzzles; task 2: math; task 3: puzzles). Results indicated that collective efficacy was a more salient predictor of group performance than self-efficacy. Examination of the interaction effects suggested that the positive effects of collective efficacy on task performance were moderated by the levels of individual members’ self-efficacy, that is, when group members’ self-efficacy was high, task performance was lower. However, the debilitating effect disappears in the last task, where self-efficacy no longer undermines task performance when group members’ collective efficacy is high. Interestingly, heterogeneity of the group in terms of gender and ethnicity composition significantly predicted task performance of the group: groups comprising more boys and groups comprising members of different ethnic backgrounds had lower task performance. Findings are discussed in relation to their theoretical contributions and applied implications for classroom teaching and learning.

**Task Performance in Small Group Settings: The Role of Group Members’ Self-Efficacy, Collective Efficacy, and Group Characteristics**

Individual’s beliefs about their competence in performing a task, or self-efficacy beliefs, motivate and guide their subsequent thoughts, effort, and actions (Bandura, 1997). Since its inception (Bandura, 1977), a substantial body of literature has shown that self-efficacy is generally a potent positive predictor of performance in both organizational and educational settings (e.g., Klassen, Usher, & Bong, 2010; Lee, Lee, & Bong, 2014; Schunk & DiBenedetto, 2015). However, collective efficacy, the group counterpart to self-efficacy in group settings, is comparatively less studied. Despite being labeled as “a neglected construct in the study of school and student achievement” (Goddard, 2001, p. 467), prior research on collective efficacy has primarily been conducted with adult or undergraduate samples in organizational or business school settings (e.g., Lent, Schmidt, & Schmidt, 2006; Tasa, Taggar, & Seijts, 2007; Li, Zhou, Zhao, Zhang, & Zhang, 2015), and recently with teachers in educational settings (e.g., Klassen et al., 2008). Research into collective efficacy among early adolescents, especially in small group settings, is relatively limited.

Although group collaboration, or working together in a group to accomplish tasks, has been found to be beneficial for the quality of learning, achievement, and development of social skills (Galton & Hargreaves, 2009), the role of collective efficacy in group collaboration among early adolescents has not been well understood (Klassen & Usher, 2010). An extant study with Canadian adolescents (Klassen & Krawchuk, 2009), for example, suggests that relative to collective efficacy self-efficacy is a more salient predictor of task performance in small group settings. With the ubiquity of small collaborative learning groups in schools (Webb & Mastergeorge, 2003), further understanding of how collective efficacy beliefs operate in small group settings among early adolescents is useful for practitioners to optimize the benefits of this pedagogical tool. In addition, prior research also did not examine the interactive effects of self- and collective efficacy, nor did they examine the influence of group composition on group performance. The majority of studies were also predominantly conducted in Western settings whereby individualist values are emphasized (Klassen & Usher, 2010), and thus findings cannot be generalized to other cultural settings.

The present study aims to extend and contribute to the literature in the following ways. First, the study not only juxtaposes the salience of self- and collective efficacy but also examines the interactive effect of the two efficacy beliefs in early adolescents’ task performance. Group characteristics (e.g., mean age, group size, mean gender and ethnic compositions of the groups) and their influence on task performance are also examined. The study is also conducted in Indonesia, a culturally collectivistic society that is relatively under-represented in the educational psychology literature.

**Efficacy Beliefs**

Self-efficacy is an individual’s self-perception of his or her own competence in executing a specific task effectively (Bandura, 1997). An important concept for both teachers and students in understanding motivational processes (Schunk & DiBenedetto, 2015), extensive research has been conducted to elucidate the sources and effects of self-efficacy in educational settings. Past studies have consistently shown that self-efficacy correlates positively and significantly with measures of motivation (e.g., task persistence, effort), self-regulation (e.g. performance monitoring, goal setting) and learning (Komarraju & Nadler, 2013; Schunk & Pajares, 2009; Skaalvik, Federici, & Klassen, 2015; for overview, see Schunk & DiBenedetto, 2015). In particular, academic self-efficacy in various subject areas has been shown to predict academic achievement directly (Carroll et al., 2009; Lee et al. 2014) or indirectly via monitoring and regulation of impulses (Komarraju & Nadler, 2013) and grade goals (Lee, Lee, & Bong, 2014). Researchers have also found a similar relationship between self-efficacy beliefs and educational outcomes in early adolescence (e.g., Klassen, 2002; Vieno, Santinello, Pastore, & Perkins, 2007).

Recognizing the interdependence of human behavior, Bandura (1997)’s theory also encompasses group-level beliefs that explain the behavior of individuals in a collective unit. Collective efficacy is defined as “a group’s shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments” (Bandura, 1997, p. 447), or the perceived ability of the group to execute a task effectively. As Tasa, Seijts, and Taggar (2007) posit, “collective efficacy does for teams what self-efficacy does for individuals” (p. 23).

Collective efficacy has been examined across a variety of contexts from sports teams and schools to neighborhoods and organizations (Goddard & Salloum, 2012). Previous studies have documented the influences of collective efficacy on group processes (e.g., goal setting, task strategies employed) and outcomes (e.g., task performance), among others (Baker, 2001; Bandura, 1997; Katz-Navon & Erez, 2005; Kellett, Humphrey, & Sleeth, 2009; Li, Zhou, Zhao, Zhang, & Zhang, 2015). In particular, a meta-analytic review has shown a strong positive relationship between collective efficacy and group performance (Stajkovic, Lee, & Nyberg, 2009). Other studies have also looked at group cohesion (i.e., team members’ positive feelings about group interaction, Lee & Farh, 2004) which has been documented to correlate highly with collective efficacy and positively predicts team performance (Casey-Campbell & Martens, 2009; Castaño, Watts, & Tekleab, 2013; Lent et al., 2006).

Collective efficacy plays a critical role in educational settings, where teachers work together to influence students, and students are exposed to various group settings, be it class groups or transient groups with diverse members. As Kurt Lewin (1943) aptly stated, “all education is group work” (p.115), underscoring the need to investigate the dynamics of group processes and cooperative learning. Cooperative group work has been shown to be an effective approach, and for some cases more effective than the whole class approach, when teaching new concepts in English, Mathematics, and Science to students aged 11 to 14 years (Galton, Hargreaves, & Pell, 2009). In spite of theoretical and empirical arguments on the importance of collective interaction and motivation in schools for *both* the teachers and the students, the majority of studies have focused on teachers’ collective beliefs and its influence on student achievement (e.g., Klassen et al., 2008, 2010). A review of self-efficacy studies conducted from 2000 to 2009 revealed that only 2 out of 227 studies had looked at collective efficacy of students (Klassen & Usher, 2010). More recently, Pina-Neves, Faria, and Räty (2013) presented an integrated model of students’ self-efficacy and their collective sense of efficacy as a class and explored their comparative impact on individual academic achievement. The authors found that while both self- and collective efficacy contributed positively to academic achievement, the impact of students’ collective efficacy seemed to be weaker, perhaps due to the independent nature of students’ individual achievement.

In a study conducted by Klassen and Krawchuk (2009), 414 Canadian early adolescents were randomly assigned into small groups of three or four and participants completed a series of three interdependent performance tasks. Completed measures of self- and collective efficacy, along with group cohesion, indicated that although the effects of collective efficacy beliefs on performance increased over time, self-efficacy was still a more salient predictor of group performance. Findings from this study were used to elucidate the dynamics of collective efficacy among early adolescents and offer practical implications for group work among students in school.

Nonetheless, there is generally a paucity of studies that examine collective efficacy among school students, in particular, the relationship between collective efficacy and group performance among early adolescents. Those who did, such as Klassen and Krawchuk (2009), did not examine the effect of group characteristics on performance beyond controlling for group size, nor did they examine possible interactive effects between self- and collective efficacy. In addition, the study was conducted in Canada, a primarily individualistic country, and findings may not be generalisable to early adolescents in other cultures, such as those from collectivistic countries.

**Cultural Differences in Efficacy Beliefs**

 The influence of cultural values on motivation has received increasing attention in educational settings (Klassen, Durksen, & Tze, 2013). While extensive research has been conducted in the field of efficacy beliefs, about 58% of the research studies on efficacy beliefs were conducted in America (Klassen & Usher, 2010). Cross-cultural self- and collective efficacy investigations are important as it provides valuable insights into how these beliefs are shaped and explain how they might operate as a function of culture (Pajares, 2000).

 The cultural value that has received the most attention is individualism and collectivism. The individualism/collectivism (I/C) continuum was posited to play a critical role in the formation of efficacy in diverse settings through its influence on information appraisal and the differing values placed on efficacy sources (Oettingen, 1995). It was proposed that in Western individualistic cultures, where individual processes are emphasized, self-efficacy is a more important motivating factor, whereas collective efficacy is more relevant in non-Western collectivistic settings where the focus is placed on group-oriented values (Klassen, 2004; Triandis, 1996).

 In rejection of the idea that self-efficacy has a lesser influence in collectivistic cultures, Bandura (1997) maintained that “People live their lives neither entirely autonomously nor entirely interdependently in any society. . . . Interdependence does not obliterate a personal self” (p. 32). He argued that even individuals in collectivistic settings vary in their level of collectivism, and these individuals, too, will behave differently when interacting with in-group and out-group members. Thus, self-efficacy is equally valued by collectivists as “without a resilient sense of self, people are easily overwhelmed by adversities in their attempts to improve their group life through collective effort” (p. 32).

Nonetheless, emergent studies in various settings seem to suggest that there are indeed cultural differences in the manifestation of efficacy beliefs (for review, see Evans, 2014; Klassen, 2004). Earley (1993) reported that for collectivist participants, performance and efficacy beliefs were highest in the group setting while for individualist participants, it was in the individual setting. Other studies documented higher levels of self-efficacy in individualistic countries such as America while collectivistic countries like Hong Kong displayed higher levels of collective efficacy when predicting participative decision making and job control (Lam, Chen, & Schaubroeck, 2002; Schaubroeck, Lam, & Xie, 2000). Oettingen and Zosuls (2006) reviewed studies which compared adolescents who were raised in an Asian or Western culture and found that those who grew up in Asian cultures hold weaker self-efficacy beliefs than their counterparts in mastering developmental tasks in domains of achievement, vocation, and emotional independence. Yet, the same adolescents were also documented to have more successful mastery of the above-mentioned tasks. In educational settings, studies investigating teachers’ collective efficacy also provided evidence that cultural contexts influence the relationship between efficacy beliefs and outcome variables (Klassen et al., 2008; Klassen et al., 2010; for review, see Klassen et al., 2013).

 As posited by Driskell and Salas (1992), “Some team members are more collectively oriented than are others – that is, they exhibit more interdependent behavior in task group – and this may affect team performance” (p. 279). Differences in cultural beliefs affect how efficacy beliefs are formed (Evans, 2014; Pajares, 2000) and these beliefs may be particularly consequential for early adolescents who are prone to changes in their perceived efficacy to complete specific tasks (Oettingen & Zosuls, 2006; Stipek, 1998).

**Group Characteristics**

The diversity among group members is another area of concern that has received much attention from small group researchers. Previous studies have suggested that group characteristics are predictive of team performance, perhaps as it highlights the diversity among team members (Bell et al., 2011; Lee & Farb, 2004; Trinh, 2015; Williams & O’Reilly, 1998). As diversity indicators, the predictive power of group characteristics is said to be dependent on the length of time the group members have worked together since the formation of the group (Harrison, Price, Gavin, & Florey, 2002). In particular, surface-level diversity (e.g., overt demographic differences in age, gender, and ethnicity) are particularly significant to newly formed groups as group members possess little information on their team mates that can be utilized to predict the behavior of other group members (Allport, 1954). To reduce uncertainty in their prediction, they rely on easily observable surface level differences to predict the possible thoughts, attitudes, and consequently, the behaviour of others (Fiske, 2002).

Research examining surface-level diversity have indicated that it has a negative impact on the groups’ social integration (Harrison et al., 2002), with the increased diversity ultimately leading to a decline in group performance through its negative influence on members’ cooperation, coordination, and cohesion (Milliken & Martins, 1996). Specifically, the majority of studies examining surface level differences have investigated the impact of heterogeneity in ethnicity and gender on group process and performance in organizational settings. Williams and O’Reilly (1998) reported that a large number of field studies have revealed that heterogeneous teams in terms of ethnicity and gender are often less cohesive, and exhibit decreased performance. In a meta-analysis by Bell et al. (2011), the authors examined the link between demographic diversity and team performance and found that race and gender diversity were negatively related to team performance. Trinh (2015) reviewed studies which examined the impact of demographic diversity and confirmed that ethnicity diversity has a negative influence on team communication and member's learning. Other surface variables such as group size are commonly included as a control variable (e.g., Klassen & Krawchuk, 2009) while age is less often investigated. In Bell et al. (2011), age diversity of the groups was found to be unrelated to group performance.

However, few have endeavored to explore the above relationships among adolescents in schools. Previous literature may offer some insight on the possible influence of diversity among adolescents, in particular through its link with adolescent friendship norms. As the theory of homophily suggest, individuals are more likely to establish a relationship with people who are perceived to be more similar to them, and thus friendships in adolescence are often similar in gender and ethnicity (Baerveldt, Van Duijin, Vermeiji, & Van Hemert, 2004). Children have also been found to attribute fewer positive traits and more negative traits to peers of the opposite gender, compared to own-gender peers (Susskind & Hodges, 2007), suggesting that children may be less willing to interact with other-gender peers. Research examining children's ethnic group attitudes also suggest that generally children like someone from their ethnic in-group over out-group, although some variations across different ethnic groups were observed (Davis, Leman, & Barrett, 2007). Thus, group diversity is also likely to negatively affect group performance in adolescence where great emphasis is placed on friendships, and adolescents in homogenous groups are more satisfied with their groups as they are congruent with their friendship norms.

**The Present Study**

The main objective of this study is to investigate the role of group members’ efficacy beliefs and group characteristics on task performance in small group settings. Extending previous research (e.g., Klassen & Krawchuk, 2009), we examined adolescents’ group performance in Indonesia, a non-western and relatively collectivistic culture. We hypothesized that compared to self-efficacy, collective efficacy will be a more salient predictor of group performance in a collectivistic culture. In addition, group characteristics were also examined to discern the influence of surface-level diversity on group performance among early adolescents. In line with the above literature, group size and age will be included as a control variable. It is hypothesized that heterogeneity of the group in terms of gender and ethnicity will negatively predict task performance among adolescents due to their preference in forming relationships with similar peers.

**Methods**

**Participants**

The sample (*M*age= 11.70, *SD* = 1.13) consisted of 435 early adolescents randomly divided into 116 groups of three or four participants of the same grade. These participants were in Year 5 (24.8%), Year 6 (22.5%), Year 7 (26.9%), and Year 8 (25.7%). Of the total sample, 53% were female and the majority of the sample were Chinese (81.1%), with 9.4% of mixed ethnicity (Chinese and non-Chinese) and the other 9.5% being non-Chinese. This sample was drawn from a middle-sized private school that catered to students from Year 1 to Year 12. The language spoken at home was mainly Indonesian (85.7%), with local dialect (2.1%) and a mixture of both (12.2%) as the next most common home languages. All the participants were born and grew up in Indonesia.

**Measures**

**Self-efficacy and collective efficacy.** Both the self-efficacy and collective efficacy measures were constructed according to guidelines by Bandura (2006) and recommendations by self-efficacy researchers (Klassen, 2004; Pajares, 1996). As asserted by Bandura (1997, p. 37), efficacy measures should focus on beliefs “about what one can do under different sets of conditions with whatever skills one possesses” rather than on assessing current skills. Thus, in the current study, the efficacy measures assessed the individuals’ or groups’ beliefs in their ability to carry out a task exhibited close similarities with the criteria task and reflected increasing levels of challenge (e.g., when a greater amount of tasks and a certain time constraint are set). Items on the self-efficacy and collective efficacy measures were worded to reflect students’ estimations of their performance on the subsequent task when they attempted the task individually (for self-efficacy) and as a group (collective efficacy). For example, the main instruction of the self-efficacy measure for the puzzles (find-the-difference or FTD) task read, “Now think about doing five of these puzzles by yourself (or with your group for collective measure) in four minutes (there are 60 differences). What is your confidence level of getting 10 to 60 of these differences in four minutes?” This instruction was followed by six statements reflecting increasing levels of challenge, ranging from “Working by myself, in 4 minutes I can get at least 10 rights” to “Working by myself, in 4 minutes I can get at least 60 rights.” The collective efficacy measure had parallel wording as the self-efficacy measure, but asked participants to rate their confidence in their group, for example, “In 4 minutes, I think our group can get at least 10 right”. Participants responded to these self-efficacy and collective efficacy measures on an 11-point scale (0 = Can’t do it at all; 5 = Maybe can do; 10 = Certainly can do). Following the procedure by Klassen and Krawchuk (2009), in the interest of time, self-efficacy (SEFTD) was measured only once prior to the first find-the-difference task (FTD 1) and was used as a predictor for both find-the-difference tasks (FTD 1 and FTD 2). The Cronbach’s alpha reliability was = .91 for SEFTD, = .89 for CE1FTD, = .93 for SEMATH, = .90 for CEMATH, and = .88 for CE2FTD.

**Group cohesion.** Group cohesion was measured using a 5-item scale adapted from Lee and Farh (2004). The scale was originally developed by Price and Miller (1986) to assess the levels of togetherness and of the desirability of relationships among members of a group. Two items were slightly modified to suit the nature of the task and the fact that the participants were in their early adolescence. For example, “Would you socialize with a member of your group?” became “Would you ‘hang out’ with members of your group?” to suit our adolescent participants. Participants responded on an 11-point response scale (1 = not at all; 5 = extremely well/certainly). Cronbach’s alpha reliability for this scale was good (= .77).

**Performance tasks.**Two performance tasks (find-the-difference [FTD] puzzles and simple arithmetic problems) designed by Klassen and Krawchuk (2009) for a similar study were used in the present study. These tasks were developed to provide sufficient challenge for children and adolescents (i.e., 10-15 years) with varied ages and abilities and to foster interdependence and collaboration. As recommended by small group researchers (e.g., Baker, 2001), collective efficacy was measured over at least three tasks. In this study, the three tasks included two FTD tasks (performance tasks 1 and 3) and one arithmetic task (performance task 2). The FTD task consisted of five pairs of similar pen-and-ink drawings (puzzles) with 12 subtle differences in each puzzle which participants had to spot and mark out in four minutes. The math task was included and administered between the two FTD tasks to promote the formation of collective efficacy beliefs by providing additional group experiences (Baker, 2001). It consisted of 70 questions, each requiring participants to calculate the sum of three 2-digits numbers (e.g., 89 + 13 + 10). The math task was meant to be familiar to all students in Year 5 and Year 6. Both FTD and math tasks were designed to ensure positive task interdependence, in which good performance and success were dependent on each member’s contribution and cooperation (Johnson, Johnson, & Holubec, 1993; Katz-Navon & Erez, 2005). The tasks were meant to be *additive* and *cooperative* (Shaw, 1976) suggesting that group’s performance was an aggregate of individual members’ performances and that chances of success were highly dependent on cooperation between group members (see Klassen & Krawchuk, 2009 for a more detailed description of the tasks). The FTD tasks and arithmetic questions were presented in such a way that all group members could work simultaneously.

**Procedures**

Based on recommendations from small group researchers (Baker, 2001; Lindsley, Brass, & Thomas, 1995), collective efficacy was measured over at least three tasks to elucidate the dynamic relationship between collective efficacy and group performance. A series of three tasks would allow group members to evaluate both their individual and collective performance. Participants completed the tasks in this sequence: the first set of five find-the-difference puzzles (FTD 1), a set of 70 math items, and a second set of five FTD puzzles (FTD 2). All tasks and measures were in the Bahasa Indonesian as the official language in Indonesia.

Participants in the same grade gathered in the classes of 30-40 and were introduced to the project. The students were divided at random into small groups of three or four. Each of them was assigned a number and students with the same number were asked to group together. For example, in the class comprising 35 students, which allowed forming nine groups (eight groups of four and one group of three), the students were randomly assigned a number between 1 to 9. This procedure enabled us to form groups randomly. Each of the students was given individual response booklets that contained a demographic section, an example of a FTD puzzle, and the measures for self-efficacy, collective efficacy, and group cohesion. After the students had provided their demographics, researchers introduced the FTD puzzles and gave explanations on how to complete them. They were then given one minute to complete the FTD example individually. Subsequently, the correct answers were revealed to the students and they were requested to complete the first self-efficacy measure (SEFTD). After the completion of SEFTD measure, students were randomly assigned to small groups of three or four participants.

Each small group was given a test booklet containing all the performance tasks (FTD 1, math task, FTD 2). The FTD puzzles and math questions were printed on facing pages so two pages can be displayed at one time, allowing concurrent viewing and cooperative work by group members. The small groups were informed that they will be working together on the tasks and were advised that cooperation will lead to higher chances of success. Prior to working on FTD 1, the students completed a collective efficacy scale individually (CEFTD). The groups then completed a series of eight tasks in the following sequence: collective efficacy scale (CEFTD; completed individually), FTD 1 (completed by group), math example items (individual), SEMATH (individual), CEMATH (individual), math task (group), group cohesion measure (individual), CE2FTD (individual), and FTD 2 (group). The researchers offered verbal encouragements to cooperate throughout the session and reminded participants to open the test booklets to two pages. Participants were debriefed about the purpose of the study at the end of the 40-50 minute session.

**Analyses**

The most common methodological approach of past studies of group processes was the aggregation of individual-level variables to group-level variables (Alavi & McCormick, 2008). In particular, Bandura (1997) believed that collective efficacy is an *individually* based assessment of group capability. He and various small group researchers (e.g., Goddard, 2001; Lee & Farh, 2004; Prussia & Kinicki, 1996) had favoured the aggregation of each group members’ perceived collective efficacy to form a group-level variable of collective efficacy, as opposed to aggregations of individual members’ self-efficacy in achieving the group outcome, or through group discussion assessment of collective efficacy. Similarly, following their recommendations, individual-level variables (academic ability, self-efficacy, collective efficacy, and group cohesion) were aggregated to form group-level variables. The aggregated scores were assigned to all group members within the same group1.

Similarly, to assess group characteristics diversity within each group, we aggregated the individual variables for group characteristics (group size, age, gender, and ethnicity) to the group level. Gender was coded as follows: female = 0 and male = 1. The mean variable indicated both gender diversity in the group, and whether the group had more male or female members. For example, a mean score of 0 indicates 100% homogenous female group; a mean score of 0.5 indicates 50% female, 50% male, and 100% diverse group; a mean score of 1 indicates 100% homogenous male group. The mean gender variable, like the one we calculated and used in this study, has been used to examine gender diversity and was found to show similar results as compared to other gender diversity indexes (see e.g., Wegge, Roth, Neubach, Schmidt, & Kanfer, 2008). For ethnicity diversity, we examined the proportion of ethnic minority students in the student groups. This is in line with past educational research where ethnic composition of classrooms is often operationalized by calculating the proportion of ethnic minority students in the classroom (see e.g., Van Ewijk & Sleeger, 2010). In this study, student’s ethnicity was coded in such a way that the greater the ethnic heterogeneity of a group (i.e. the group consists of more members of different ethnic backgrounds) the higher the ethnicity mean or aggregated score of the group (1 = Chinese, 2 = Mixture Chinese & Non-Chinese, 3 = Non-Chinese). Both gender and ethnic composition of the group were treated as a continuous variable (mean) in all models, with the mean scores assigned to all group members belonging to the same group (see Wegge et al., 2008; Van Ewijk & Sleeger, 2010 for a similar rationale).

In addition to the theoretical rationale, one-way ANOVAs were conducted with group as the independent variable and self-efficacy, collective efficacy, and group cohesion (i.e. the variables that would be aggregated) as the dependent variables to determine within-group variability (Lee & Farb, 2004; Prussia & Kinicki, 1996). The ANOVAs were significant at *p* <.01, suggesting that there was more between-group variability than within-group variability. This provided statistical support for the appropriateness of group-level creations of the individual variables. All statistical analyses were conducted using IBM SPSS Statistics 21.

**Results**

**Preliminary and Correlation Analyses**

Descriptive statistics (mean, SD), distributional properties (skewness, kurtosis), and correlation coefficients for the key variables are presented in Table 1. The distributional properties of the multi-item subscales approximate a normal distribution as indicated by relatively low skewness and kurtosis values (i.e., observed skewness values < 1.07 and observed kurtosis values < 5.66). Curran, West, and Finch (1996) asserted that skewness values less than 2 and kurtosis values less than 7 can be accepted as within the cut-off for normal distribution.

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Positive correlations were found between collective efficacy in a task and actual group performance in the corresponding task: FTD 1 (*r* = .25, *p* < .01), math (*r* = .43, *p* < .01) and FTD 2 (*r* = .30, *p* < .01). Albeit relatively weaker, self-efficacy for the FTD task was positively associated with group performance for FTD 1 (*r* = .12, *p* < .05) and FTD 2 (*r* = .24, *p* < .01), and self-efficacy in math was positively correlated with group performance on the math task (*r* = .32, *p* < .01). Self-efficacy was also positively correlated with collective efficacy in the corresponding tasks (*r* = .68 between SEFTD and CE1FTD; *r* = .86 forSEMATH and CEMATH; *r* = .59 for SEFTD and CE2FTD; all at *p* < .01). These correlations between the two efficacy beliefs were in the same range as those in a study by Klassen and Krawchuk (2009) who found the average correlations of *r* = .61 and *r* = .56 between SEFTD and CE1FTD and between SEFTD and CE2FTD, respectively, and the average correlation of *r* = .82 between SEMATH and CEMATH, across their two samples (older and younger early adolescents).

The present findings that the two efficacy beliefs in the corresponding tasks shared between 35% and 74% of the variances were consistent with Bandura's (1997) theoretical contention that self-efficacy and collective efficacy develop from similar sources (e.g., past performance, vicarious experiences; see also Goddard, Hoy, & Woolfolk-Hoy, 2004). Furthermore, as individual group members’ own abilities in performing an assigned task affect their group’s ability in its performance on the task, it is intuitively logical to expect that individual group members’ self-efficacies contribute to their group’s collective efficacy. This relationship is further strengthened by the fact that, in most studies that examined both self-efficacy and collective efficacy (e.g., Klassen & Krawchuk, 2009), the information on the two efficacy beliefs is derived from self-report measures. Whilst these relatively high relationships between the two efficacy beliefs may potentially lead to a ‘*net*’ suppression effect (Cohen & Cohen, 1983) which occurs when the regression coefficient of a predictor variable in predicting a criterion variable has an opposite sign from the correlation of the two variables, it is indeed the purpose of this study to ascertain the extent to which one of the two efficacy beliefs *acts as* a suppressor variable for the other in predicting a group performance among the sample of Indonesian adolescents just like Klassen and Krawchuk (2009) did with their Canadian sample (i.e., to examine the effect of self-efficacy on a group performance while controlling for the effect of collective efficacy, and *vice versa*, see Ludlow & Klein, 2014 for a recent discussion on suppression effects).

Group cohesion was positively correlated with all the group performances (*r* = .17 for FTD 1; *r* = .19 for the math task; and *r* = .15 for FTD 2, all at *p* < .01). In terms of group characteristics, group size was associated with better performance in all the tasks: FTD 1 (*r* = .16, *p* < .01), math (*r* = .37, *p* < .01) and FTD 2 (*r* = .19, *p* < .01). Interestingly, the higher proportion of male students in the groups was associated with lower self-efficacy beliefs (range between *r* = -.13 and *r* = -.26, *p* < .01), collective efficacy beliefs (range between *r* = -.06 and *r* = -.11), as well as performance in math (*r* = -.11, p < .05) and FTD 2 (*r* = -.12, p <.01), whereas the more ethically heterogeneous the groups were related to lower group performances (*r* = -.22 for FTD 1; *r* = -.13 for the math task; and *r* = -.18 for FTD 2, all at *p* < .01).

**Main Analysis**

To examine how variables in the current study predicted group performance in the three tasks, hierarchical multiple regression analyses were performed for each of the performance tasks (FTD 1, the math task, and FTD 2). Members’ mean self-efficacy and mean academic ability was entered in step 1. In the second step, collective efficacy and group cohesion were entered. Group characteristics variables (group size, mean gender, mean ethnic, and mean age) were entered in the third step. Finally, the interaction term for self-efficacy and collective efficacy (SF\*CF) was entered in the final step. Results for the regression analyses were presented in Table 2. For the interpretation of the interaction effects, multiple equations were formed by alternating the values of the main effects and holding all other variables in the model constant. For all three tasks, the high and low group were defined as those scoring more than one standard deviation above and below the variable mean respectively. This enabled us to plot Figures 1-3.

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For Task 1 (FTD 1), self-efficacy and academic ability were entered in step 1, with self-efficacy significantly predicting group performance ( = .12, *p* < .05), *R2* = .015, *p* < .05. The addition of collective efficacy and group cohesion at step 2 further increased prediction of group performance, *R*2 = .072, *p* < .001. Group characteristics added to the equation at step 3 also significantly increased explained variance, *R*2 = .258, *p* < .001. In step 4, SF\*CF interaction term was entered and increased prediction of group performance, *R*2 = .012, *p* < .01. The final model was predictive of group performance on FTD 1 (*R2* = .357, *F* (9, 425) = 26.165, *p* < .001). Self-efficacy ( = -.14, *p* < .05), collective efficacy ( = .18 *p* < .01), group cohesion ( = .14, *p* < .01), mean ethnic ( = -.15, *p* < .001), mean age ( = .51, *p* < .001), and the SF\*CF interaction term ( = .12, *p* < .001) contributed significantly to group performance on FTD 1.

The interaction between self-efficacy and collective efficacy (SF\*CF) was plotted and presented in Figure 1. Generally, groups of participants with high levels of collective efficacy performed better than those with low levels of collective efficacy; groups of participants with lower levels of self-efficacy performed better than those with higher levels of self-efficacy. However, the negative effect of self-efficacy appeared to be more pronounced in groups of participants with a lower level of collective efficacy.

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INSERT FIGURE 1 ABOUT HERE

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For Task 2 (math task), group performance at step 1 (*R2* = .101, *p* < .001) was predicted by self-efficacy ( = .30, *p* < .001) while academic ability was not a significant predictor. In step 2, the entry of collective efficacy and group cohesion significantly increased prediction (*R*2 = .102, *p* < .001), as did the addition of group characteristics variables in step 3, (*R*2 = .386, *p* < .001). The SF\*CF interaction term in the final step significantly increased R2, *R*2 = .005, *p* < .05. In the final model, self-efficacy ( = -.20, *p* < .01), collective efficacy ( = .11, *p* < .01), group cohesion ( = .08, *p* < .05), group size ( = .32, *p* < .001), mean gender ( = -.09, *p* < .05), mean age ( = .575, *p* < .001), and the SF\*CF interaction term ( = .08, *p* < .05) significantly predicted group performance on the math task, *R2* = .594, *F* (9, 425) = 69.091, *p* < .001.

Figure 2 shows the interaction between self-efficacy and collective efficacy in the math task. Consistent with the previous task, groups of participants with high levels of collective efficacy led to higher group performance in comparison to those with low collective efficacy; groups of participants with a lower level of self-efficacy appeared to perform better than those with a higher level of self-efficacy.

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INSERT FIGURE 2 ABOUT HERE

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In the final task (FTD 2), both self-efficacy and academic ability were entered in step 1 and self-efficacy ( = .24, p < .001) was a significant predictor, *R2* = .056, *p* < .001. Adding collective efficacy and group cohesion at step 2 significantly increased prediction (*R*2 = .05, *p* < .001), with collective efficacy ( = .25, *p* < .001) contributing to the increase. In step 3, group characteristics were entered and further increased prediction of group performance, *R*2 = .306, *p* < .001. The SF\*CF interaction term further increased prediction when entered in step 4, *R*2 = .011, *p* < .01. The final model significantly predicted group performance on FTD 2, *R2* = .425, *F* (9, 425) = 34.844, *p* < .001. Collective efficacy ( = .14, *p* < .01), group size ( = .12, *p* < .01), mean gender ( = -.11, *p* < .01), mean ethnic ( = -.10, *p* < .05), mean age ( = .54, *p* < .001), and the SF\*CF interaction term ( = .11, *p* < .01) were significant predictors.

A graph of the SF\*CF interaction term is presented in Figure 3. Analogous with previous performance tasks, groups of participants exhibiting high levels of collective efficacy had generally better performance relative to those with low levels of collective efficacy. However, in contrast with group performance on FTD 1 and the math task (task 1 and 2, respectively), the effect of self-efficacy on group performance were different for groups of participants with differing levels of collective efficacy. That is, the effect of self-efficacy tended to be positive on group performance for groups of participants with a higher level of collective efficacy, whereas the effect of self-efficacy tended to be negative on group performance for groups of participants with a lower level of collective efficacy. As a result, groups of participants that had higher levels of both collective and self-efficacies showed the highest level of group performance.

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INSERT FIGURE 3 ABOUT HERE

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**Discussion**

 Previous research conducted among early adolescents has shown that self-efficacy was a more salient predictor of task performance in small group settings compared to collective efficacy (Klassen & Krawchuk, 2009). However, few studies to date have explored the interaction between efficacy beliefs, the influence of group characteristics in small group settings among early adolescents. Consistent with our hypothesis, results indicated that not only was collective efficacy was a positive predictor of task performance for FTD 1, the math task, and FTD 2, it was also a more salient predictor compared to self-efficacy. These findings corroborated past studies with undergraduates where collective efficacy, rather than self-efficacy, predicted task performance in highly interdependent tasks (Katz-Navon & Erez, 2005; Kellett, Humphrey, & Sleeth, 2009). However, in comparison to Klassen and Krawchuk’s (2009) study involving samples of early adolescents, the current findings differ from that of their study in Canada, where self-efficacy, as opposed to collective efficacy, was a more salient predictor of task performance.

 Perhaps, in a collectivist culture such as Indonesia, collective efficacy played a greater role in predicting performance in interdependent group task among early adolescents. As the literature suggests, cultural values may indeed affect the manifestation of efficacy beliefs (Klassen, 2004; Lam et al., 2002; Oettingen & Zosuls, 2006; Schaubroeck et al., 2000). According to the I/C theory, people in cultures high in individualism (e.g., the United States and Canada) are more autonomous and place a higher emphasis on individual goals, whereas people in collectivist cultures (e.g., Indonesia) are more interdependent and focus on the needs of the in-group (Hofstede, Hofstede, & Minkor, 2010; Triandis, 1996). In fact, it was posited that children in collectivistic settings are often taught to follow and respect the needs of their in-group by their families (Hofstede et al., 2010; Oettingen, 1995) and these cultural values may influence collectivist children to be more reliant on group effort than individual ability (Mau, 2000). Thus, in the current study conducted in a collectivist culture, collective efficacy has a stronger effect on adolescents’ group performance, perhaps as the goals of the in-group are of a higher importance when determining social behavior as opposed to individual goals.

 The above findings do offer some support to the notion that efficacy beliefs manifest differently among adolescents from different cultural backgrounds during group work. However, Klassen (2004) cautioned that such differences in cross-cultural comparisons can also be attributed to other contextual differences beyond cultural factors such as education systems. Thus, the stronger role of collective efficacy, in comparison to self-efficacy, in predicting group task performance may also be due to education system differences. That is, some education systems group students in such a way that they belong to the same class throughout their schooling years. The time the students spend together may help foster their bonding as a class through the recognition and acceptance of strengths and weaknesses of individual members of the class and, in turn, heighten the role of collective efficacy in predicting group task performance. Although this class arrangement was not the case in the present study, the fact that the study was conducted in the midst of the academic year may perhaps have induced the participants’ greater group cohesion which then led to the stronger role of collective efficacy compared to self-efficacy. Future research may clarify this by conducting the same group activities in the beginning and at the end of academic year.

Examination of interaction effects indicated that the positive effects of high collective efficacy on task performance were moderated by the levels of group members’ self-efficacy. Highest performance at FTD 1 and the math task was observed when self-efficacy was low. Conversely, when group members’ self-efficacy was high, groups with high collective efficacy achieved comparatively lower performance for the two tasks. These findings seem to suggest that when individual students in a group were overconfident, perhaps wanting to present their individual abilities during the collaborative work, group performance will be undermined. Indeed, Stone (1994) have pointed out that initial “first impression” self-efficacy beliefs can lead to overestimates of personal capabilities (i.e. overconfidence). These overconfident individuals are more likely to commit logic errors, have lower motivation (Vancouver, Thompson, Tischner, & Putka, 2002; Vancouver & Kendall, 2006; Vancouver, Gullekson, Morse, & Warren, 2014) and contribute fewer resources to the task (Stone, 1994), all of which have a debilitating impact on task performance. Studies examining the impact of decrease in confidence on performance suggest that some self-doubt encourages individuals to work towards mastering the challenges and would, in turn, lead to better performance (Bandura & Locke, 2003; Woodman, Akehurst, Hardy, & Beattie, 2010). Thus, as far as collaborative work is concerned, the optimal approaches for better group performances are beliefs and trust in the groups’ efficacy and a lesser emphasis on individuals’ performance.

In task 3, however, a group’s performance on the puzzle problems is no longer undermined by the overconfidence of its members, at least when group members’ collective efficacy is high. Group process seemed to have taken place over time and group members’ self-efficacy no longer undermines group performance, with self- and collective efficacy appearing to have a synergistic effect in group performance. Collective efficacy plays an important role in buffering the negative effect of self-efficacy on group performance over time. Perhaps as the groups worked cooperatively over the different tasks, performance feedback given after the task assist them in developing outcome expectancy on future performance (Bandura, 1997) and they thus adjusted their behaviors accordingly to optimize task performance of the group (Tasa et al., 2007). Recent research also suggests that beyond self-efficacy, individual’s confidence in the capabilities of another to reach the designated goal may also drive group performance (Emich, 2012), and such information may be obtained as group interactions increase over tasks. As Moore and Chang (2009) concluded in their study, timely feedback provided after task performance will recalibrate the relationship between participants’ self-efficacy and subsequent performance. Through the incorporation of feedback into their self- and collective efficacy beliefs, members realize the importance of cooperation and may find strategies that may capitalize their individual strengths in ways that promote cooperation and group’s efficiency.

On the other hand, at low levels of collective efficacy, groups of participants with high levels of self-efficacy had the worst task performance across all three tasks. At low levels, the buffering effect of collective efficacy on the negative effect of self-efficacy on group performance is limited. Perhaps when confidence in the group is low, group members are less likely to unlikely to benefit from cooperative work, even after multiple tasks. Individual confidence alone is not sufficient to salvage group performance.

Another purpose of the present study was to examine the role of group composition, especially gender and ethnicity, on task performance. Consistent with general expectations, groups which are larger (i.e. 4 members compared to 3) or whose members are relatively older performed better on all three performance task as they have more resources to utilize, either physically (more members) or cognitively (older). Heterogeneity of the group in terms of ethnicity (FTD 1), gender (math task), or both (FTD 2) was a significant predictor of group performance among early adolescents in the study. Specifically, groups that had more boys and groups consisting of members from different ethnic backgrounds had lower task performance. Results from the current study, especially in task 3, corroborated past research examining the influence of surface level characteristics on group performance (Bell et al., 2011; Trinh, 2015; Williams & O’Reilly, 1998) and suggest that these relationships are also manifested in small group settings among early adolescents.

The negative relationships can be explained by Byrne’s similarity-attraction theory (1971), which posits that individuals are attracted to form relationships with people who are similar to them (McPherson, Smith-Lovin, & Cook, 2001; Nangle, Erdley, Zeff, Stanchfield, & Gold, 2004). While cross-gender and cross-ethnic friendships are not unusual (Quillian & Campbell, 2003; McDougall & Hymel, 2007), adolescents generally prefer to form friendships with same-gender and same-ethnic others (Baerveldt et al., 2004; Eckes, Trautner, & Behrendt, 2005). Accordingly, members in homogenous groups are more likely to be characterized with mutual attraction and this possibly translates into stronger group cohesion, improved impression of their fellow group members and ultimately better group performance. Taken together, Byrne’s theory, along with adolescents’ preference for gender and ethnic homophily, suggest that in groups whose members are different in overt demographic variables, diversity may impede group processes and thus negatively affect the performance of adolescents groups in the early days of group interactions.

**Educational Implications**

In contrast to findings from Klassen and Krawchuk’s (2009) study, results from this study suggest that performance of early adolescents in Indonesia are more influenced by their beliefs in the group’s capabilities to complete the task than their own individual capacity. Not only do these results provide evidence that expression of motivation beliefs in adolescents is influenced by cultural contexts, it also highlights the potential value of small groups in collectivistic settings. In light of the findings that collective efficacy is a more salient predictor of group performance in collectivist culture, teachers may wish to focus attention on strategies that increase cooperative skills among students, and in turn, increase the benefits of group work in school settings. This can be done through encouraging students’ reflection on behaviours that promote or impede group processes and consequently make relevant adjustments to increase their success rate (Peterson & Schreiber, 2012), and have been documented to increase group effectiveness by increasing collective efficacy, members’ effort, among others (Johnson & Johnson, 2009).

Group characteristics were also included as predictors in the current study, and findings indicated that the more heterogeneous the groups in terms of gender and ethnicity, the lower the performance of the group. This holds important implications in the growing multicultural settings we witness in educational systems around the globe where students are often placed into mixed-ethnicity and mixed-sex groups for various tasks. On the other hand, studies in organization settings have also suggested that group diversity may sometimes enhances task performance (Roberge & Dick, 2010; van Knippenberg & Schippers, 2007) and proposed that the differing results may be due to moderating variables such as openness to diversity (Hobmanm Bordia, & Gallois, 2004) and personality characteristics such as openness to experience (Homan et al., 2008). As such, highlighting the positive implications of diversity beliefs can assist individuals in monitoring and modifying their attitudes towards diversity (van Dick, van Knippenberg, Hägele, Guillaume, & Brodbeck, 2008). Teachers should highlight the errors in students’ implicit theories about the consequences of working in a diverse group and emphasize the importance of looking beyond easily observable demographic characteristics. This is especially true for groups who do not have prior collaboration experience and are thus more likely to rely on surface characteristics to make judgments (Fiske, 2002; Harrison et al., 2002).

Finally, results indicated that the detrimental effect of self-efficacy decreases across task when group confidence is high. This suggests that as interactions increased between group members, they gain confidence in the group’s ability to execute the tasks efficiently and come to realize that working as a team is more effective than individual contributions. Teachers should thus emphasize in their instructions the importance of collaboration and group cohesiveness in classroom group tasks and also monitor group processes such that the effectiveness of this instructional tool is enhanced. Feedback regarding the group performance should be readily available to allow for adjustment of expectations and behaviors to maximize group performance (Tasa et al., 2007).

Numerous studies have documented the value of group work as an effective pedagogy for enhancement of learning (and eventual academic outcomes) and improvement of attitudes (in particular towards out-groups) through socialization (Galton & Hargreaves, 2009; Kutnick et al., 2005). While the aim of group work in schools may not always be performance-linked, researchers have demonstrated the positive benefits of cooperative group work on academic performance in various subject domains (Galton et al., 2009). The current study adds to the current literature by providing insights on how motivational beliefs operate in small groups of adolescents, and suggestions on how cooperation and learning may be fostered through their influence on group processes.

**Limitations and Future Research**

This study was not without limitations. For the sake of brevity, self-efficacy (SEFTD) was only measured at one time (prior to FTD 1) and was used as a predictor for FTD 1 and FTD 2. While the nature of tasks is the same, self-efficacy may have been a stronger predictor of performance at FTD 2 had it been measured prior to the task.

Following the recommendations of small group researchers (e.g., Lee & Farh, 2004), analyses were conducted with group-level variables where all predictors were individually assessed and subsequently aggregated at the group level. It is important to take note that while some researchers (e.g., Lent et al., 2006) chose to conduct analyses at the individual level, the majority of researchers examining group processes preferred group-level variables (Alavi & McCormick, 2008). In fact, Lent et al. (2006) reported that collective efficacy tended to account for more variance in team performance (49%) at the group level than at individual level (36%), although the authors proposed that both correlations were relatively large. Further, others (e.g., Whiteoak, Chalip & Hort, 2004) commented that there may be no difference in validity or reliability of both levels of analysis. Thus, although additional statistical analyses conducted in the present study have supported the appropriateness of aggregating the measures to group level, future studies may further illuminate group processes-related phenomena by conducting analyses at different levels.

The aggregated gender and ethnicity variables were treated as continuous variables in our analyses while they should be, more strictly speaking, ordinal variables. However, as the resulting mean scores which formed the ordinal categories is large (7 or more categories), findings from simulation studies (see e.g., Rhemtulla, Brosseau-Liard, & Savalei, 2012) had suggested that treating them as continuous variables would generate similar results. Also, although individual and group levels of analysis in studies looking into collective efficacy have shown substantively consistent findings (see e.g., Klassen & Krawchuk, 2009; Lent et al., 2006), regression analyses in the current study were conducted at the individual level with their aggregated group scores (*n* = 435). An alternative method would be to conduct regression using groups as a unit of analysis (*k* = 116). Further analyses using groups revealed that relationships between variables were in the predicted direction, identical to our original analyses, but some variables were no longer significant at *p* < .05. This may have been due to the decreased in sample size leading to a lack of power. In future studies, a larger sample size would be considered to ensure that there is sufficient power to detect statistical differences, regardless of analyses methods.

In the present study, students were placed in temporary groups for a brief period of three performance tasks. In educational settings, project groups in schools can be short-termed like the ones in the current study or can span across a semester or a year depending on the requirements of the school. Aside from surface characteristics, deep characteristics, such as members’ personalities, attributes and values, also influence group performance and its influences increases as group members’ interactions increased. Conversely, the effects of surface-level diversity, although having an immediate influence on members’ behaviors during early stages of a project, diminish in its impact on performance across time (Harrison et al., 2002). Thus, in future studies, the performance of small groups in adolescents can be measured over a longer period of time and deep characteristics can be assessed to give a more comprehensive picture of how diversity affects group performance.

**Conclusion**

This study expands the available literature on adolescents’ task performance in small group settings by exploring the role of both self- and collective efficacy and group characteristics. Findings indicated that collective efficacy was a more salient predictor across all the three tasks, over and above self-efficacy, and the debilitating effect of self-efficacy decreases over time as group members had the opportunity to interact more often. In addition, the more heterogeneous the group was in terms of gender and ethnicity, the lower the task performance the group. Together, these findings provided insights into how students in contrasting cultures behave in small group settings.

Footnote 1:

Following a reviewer’s comment, we conducted further analyses using groups (*k* = 116) instead of students (*n* = 435) at the unit of analysis and obtained similar findings. While all predicted relationships between variables were identical to the individual-level analyses, some variables such as our interaction term were no longer significant at *p* <.05 level. One plausible reason is due to the decrease in sample size from 435 to 116. In view of the number of variables we have included in our regression analyses (nine variables), the substantially smaller sample size may have decreased the power of the test, thus affecting the statistical significance of the findings. We recognized this as a limitation of the current study and have listed it as such under the limitations section.

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| Table 1. |
| *Descriptive Statistics and Within-Group Correlations for Early Adolescents* |
| No. | Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1 | Group Size | - |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | Mean Gender | .025 | - |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | Mean Ethnic | -.217\*\* | -.016 | - |  |  |  |  |  |  |  |  |  |  |  |
| 4 | Mean Age | .125\*\* | .030 | -.093 | - |  |  |  |  |  |  |  |  |  |  |
| 5 | Academic Ability | -.039 | -.183\*\* | -.145\*\* | -.135\*\* | - |  |  |  |  |  |  |  |  |  |
| 6 | Group Cohesion | -.007 | -.216\*\* | -.096\* | .002 | .338\*\* | - |  |  |  |  |  |  |  |  |
| 7 | SEFTD | -.145\*\* | -.258\*\* | .003 | .253\*\* | .207\*\* | .187\*\* | - |  |  |  |  |  |  |  |
| 8 | SEMATH | -.056 | -.133\*\* | -.020 | .373\*\* | .236\*\* | .157\*\* | .595\*\* | - |  |  |  |  |  |  |
| 9 | CE1FTD | -.008 | -.150\*\* | -.008 | .320\*\* | .208\*\* | .210\*\* | .683\*\* | .727\*\* | - |  |  |  |  |  |
| 10 | CEMATH | -.024 | -.113\* | -.067 | .412\*\* | .282\*\* | .235\*\* | .502\*\* | .855\*\* | .711\*\* | - |  |  |  |  |
| 11 | CE2FTD | -.055 | -.063 | .019 | .323\*\* | .263\*\* | .298\*\* | .592\*\* | .732\*\* | .791\*\* | .761\*\* | - |  |  |  |
| 12 | FTD 1 Score | .155\*\* | -.018 | -.220\*\* | .524\*\* | .035 | .170\*\* | .120\* | .292\*\* | .251\*\* | .263\*\* | .253\*\* | - |  |  |
| 13 | Math Score | .372\*\* | -.110\* | -.130\*\* | .644\*\* | .104\* | .185\*\* | .173\*\* | .316\*\* | .326\*\* | .430\*\* | .260\*\* | .421\*\* | - |  |
| 14 | FTD 2 Score | .190\*\* | -.117\* | -.176\*\* | .591\*\* | .028 | .145\*\* | .235\*\* | .302\*\* | .243\*\* | .299\*\* | .306\*\* | .611\*\* | .477\*\* | - |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Mean | 3.80 | .47 | 1.28 | 11.69 | 6.91 | 20.99 | 30.97 | 44.74 | 41.85 | 53.88 | 43.24 | 30.45 | 60.41 | 35.69 |
|  | SD | .400 | .234 | .329 | 1.13 | .544 | 2.50 | 6.74 | 9.46 | 7.20 | 8.57 | 7.41 | 7.71 | 7.69 | 4.90 |
|  | Skewness | -1.51 | .238 | 1.17 | -.179 | -.086 | -.626 | -.215 | -.270 | -.774 | -.475 | -.768 | .788 | -.953 | -.112 |
|  | Kurtosis | .267 | -.345 | 1.339 | -1.30 | -.134 | -.094 | -.072 | -.165 | .964 | -.165 | 1.19 | 2.70 | .065 | -.523 |
|  | Cronbach’s Alpha (α) | - | - | - | - | - | .77 | .91 | .93 | .89 | .90 | .88 | - | - | - |
| \* *p* < .05. \*\* *p* < .01. |

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| Table 2. |
| *Summary of Hierarchical Regression Analysis Predicting Group Performance (n = 435)* |
|  |  | **Task 1: FTD 1** |  | **Task 2: Math Task** |  | **Task 3: FTD 2** |
|  | Variable | *β* | *R2* | *ΔR2* | *ΔF* |  | *β* | *R2* | *ΔR2* | *ΔF* |  | *β* | *R2* | *ΔR2* | *ΔF* |
| **Step 1** |  | .015\* | .015 | 3.19\* |  |  | .101\*\*\* | .101 | 24.24\*\*\* |  |  | .056\*\*\* | .056 | 12.70\*\*\* |
|  | Self-efficacy | .118\* |  |  |  |  | .309\*\*\* |  |  |  |  | .239\*\*\* |  |  |  |
|  | Academic Ability | .011 |  |  |  |  | .031 |  |  |  |  | -.022 |  |  |  |
| **Step 2** |  | .086\*\*\* | .072 | 16.88\*\*\* |  |  | .203\*\*\* | .102 | 27.45\*\*\* |  |  | .107\*\*\* | .052 | 12.49\*\*\* |
|  | Self-efficacy | -.102 |  |  |  |  | -.176\* |  |  |  |  | .088 |  |  |  |
|  | Academic Ability | -.055 |  |  |  |  | -.047 |  |  |  |  | -.084 |  |  |  |
|  | Collective Efficacy | .302\*\*\* |  |  |  |  | .572\*\*\* |  |  |  |  | .252\*\*\* |  |  |  |
|  | Group Cohesion | .144\*\* |  |  |  |  | .094\* |  |  |  |  | .082 |  |  |  |
| **Step 3** |  | .354\*\*\* | .258 | 41.97\*\*\* |  |  | .589\*\*\* | .386 | 99.99\*\*\* |  |  | .413\*\*\* | .306 | 55.51\*\*\* |
|  | Self-efficacy | -.134\* |  |  |  |  | -.194\*\* |  |  |  |  | .010 |  |  |  |
|  | Academic Ability | .032 |  |  |  |  | .111\*\* |  |  |  |  | .017 |  |  |  |
|  | Collective Efficacy | .146\* |  |  |  |  | .308\*\*\* |  |  |  |  | .101\* |  |  |  |
|  | Group Cohesion | .136\*\* |  |  |  |  | .091\*\* |  |  |  |  | .074 |  |  |  |
|  | Group Size | .045 |  |  |  |  | .311\*\*\* |  |  |  |  | .112\*\* |  |  |  |
|  | Mean Gender | -.014 |  |  |  |  | -.085\*\* |  |  |  |  | -.110\*\* |  |  |  |
|  | Mean Ethnic | -.145\*\*\* |  |  |  |  | .031 |  |  |  |  | -.096\* |  |  |  |
|  | Mean Age | .497\*\*\* |  |  |  |  | .571\*\*\* |  |  |  |  | .538\*\*\* |  |  |  |
| **Step 4** |  | .357\*\*\* | .012 | 7.90\*\* |  |  | .594\*\*\* | .005 | 5.48\* |  |  | .425\*\*\* | .011 | 8.40\*\* |
|  | Self-efficacy | -.135\* |  |  |  |  | -.202\*\* |  |  |  |  | .000 |  |  |  |
|  | Academic Ability | .019 |  |  |  |  | .105\*\* |  |  |  |  | .000 |  |  |  |
|  | Collective Efficacy | .180\*\* |  |  |  |  | .340\*\*\* |  |  |  |  | .143\*\* |  |  |  |
|  | Group Cohesion | .143\*\* |  |  |  |  | .079\* |  |  |  |  | .080 |  |  |  |
|  | Group Size | .049 |  |  |  |  | .321\*\*\* |  |  |  |  | .115\*\* |  |  |  |
|  | Mean Gender | -.010 |  |  |  |  | -.092\* |  |  |  |  | -.113\*\* |  |  |  |
|  | Mean Ethnic | -.150\*\*\* |  |  |  |  | .027 |  |  |  |  | -.099\* |  |  |  |
|  | Mean Age | .510\*\*\* |  |  |  |  | .575\*\*\* |  |  |  |  | .542\*\*\* |  |  |  |
|  | SF\*CF | .117\*\* |  |  |  |  | .078\* |  |  |  |  | .114\*\* |  |  |  |
| *n* = 435 students in 116 groups (*k* = 116) *\*p* < .05. \*\**p* < .01. \*\*\**p* < .001 |



Figure 1. Self-efficacy x Collective Efficacy on Group Performance (FTD 1)



Figure 2. Self-efficacy x Collective Efficacy on Group Performance (Math)



Figure 3. Self-efficacy x Collective Efficacy on Group Performance (FTD 2)