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Effects of social loafing, collective orientation, and self-efficacy on adolescents cognitive task performance.

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ABSTRACT

This study investigated the effect of social loafing, collective orientation, and self-efficacy on adolescent's cognitive task performance. Eighty students (40 male and 40 females) of Community Secondary School Ugbene-Ajima in Uzo-Uwani (Mean age = 16.88 years, SD = .98) participated in the study. Two questionnaire measures were used in this study: Collective Orientation Scale and New General Self-efficacy Scale (NGSES). Social loafing was manipulated with instructions. Participants worked on a puzzle for 10 minutes after which completed pieces were counted as the measure of cognitive effort. The data were subjected to three-way analysis of variance (ANOVA). Results indicated a significant main effect of social loafing on cognitive task performance, such that the non-social loafing group had better performance in cognitive tasks than the social loafing group. There was no main effect of collective orientation on cognitive task performance. It was further shown that self-efficacy had a significant main effect on cognitive task performance, indicating that participants with high self-efficacy had better performance in cognitive tasks than those with low self-efficacy. It was suggested that efforts to curb social loafing and improve self-efficacy of students may facilitate better performance in intellectual tasks among students.

Many tasks that face students are best accomplished in groups, and many group tasks require the pooling of individual members' inputs (Forsyth, 2010). Most common tasks performed by student's are cognitive tasks such as fixing a puzzle, sports competitions, ability and aptitude questions are a few examples of tasks that require the combination of individual efforts to achieve a common goal. In some cases, these tasks are not best performed in groups, as individuals' efforts diffuse across the group, thereby negatively affecting output. Working in a group is a strategy implemented in some academic exercises such as manual labour, sports/games and puzzle arrangement with the objective to accomplish tasks that cannot be done individually (Haas, 2017).

The Sternberg and Sternberg (2012) triarchic theory of task performance holds that student's ability to successfully carry out a given task is determined by the level of one's creative, analytical, and practical abilities. Being analytical helps a student decide whether an adopted approach could work or not. Practical abilities are used to implement the ideas and persuade others to adopt the approach. In Sternberg's theory, information processing is made up of three different parts, meta-components, performance components, and knowledge-acquisition components that move from higher-order executive functions to lower order functions (Sternberg & Sternberg, 2012). Meta-components are used for planning and evaluating problems, while performance components follow the orders of the meta-components, and the knowledge-acquisition component leads to how to solve the problems. The theory emphasizes information processing, after thought, performance, and knowledge-acquisition as basic components of cognitive task performance by students. This theory in action can be explained by working on a cognitive puzzle task. First, a decision of the object that make up the puzzle is understood, and second, an understanding of the individual pieces of the puzzle.

Solving cognitive tasks (such as puzzles) could be best performed in a group. However, there are factors that can be barriers to effective group performance on cognitive tasks and among them are the phenomenon of social loafing, collective orientation and self-efficacy (Eby & Dobbins, 1998; Bandura, 1988; Robbins & Judge, 2015). According to Karau and Willians (1993), social loafing is a situation in which an individual decreases his/her effort when working on group task rather than on his/her own. In other words, one does not work diligently when working in a group, but individually. For example, a person will sing in a loud voice when truly alone, as opposed to being in a large congregation. From this example, it could be said that social loafing may make teamwork ineffective because it cannot maximize the potential of the individual members. Social loafing is the tendency for individuals to exert less effort on a task while in the social presence of others, than they would individually (Latané, Williams, & Harkins, 1979; Mefoh & Nwanosike, 2012).

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Naturally, social loafing adversely affects performance in a group or team, especially in large groups (Latane et al., 1979; Mefoh & Nwanosike, 2012). Some researchers (Harkins & Szymanski, 1989; Kerr & Bruun, 1983) defined social loafing as motivation loss in groups caused by reduced identifiability or evaluation. They argue that social loafing occurs because, in most studies, individuals' inputs can only be evaluated in the coactive condition. In the collective condition, of course, individual inputs are combined into one group product. When working on collective tasks, individuals can hide in the crowd and avoid taking the blame for a poor group performance. Collective tasks may also lead individuals to feel lost in the crowd such that they cannot receive their fair share of the credit for a good group performance (Latane et al., 1979).
The effects of social loafing has been reported among workers in organisations (Fang & Chang, 2014; Haas, 2017; Karadala, 2013), students (Kurzban, Duckworth, Kable, & Myers, 2013; Mefoh & Nwanosike, 2012; Pageaux, Lepers, Dietz, & Marcora, 2014). Simms and Nichols (2014) conducted a meta-analytic review of studies on social loafing effects on task and mental exercise performance in one decade (2004-2014). The study result revealed that a significant effect of social loafing on task performance was found in 75% of the studies reviewed. The study maintained that social and group dynamics such as team cohesion and personal orientation may be responsible for the remaining 25% of the study that found no effect of social loafing on team/task performance.

Social loafing on its own has gained a notable attention in the cognitive task performance literature. Previous studies indicate that social loafing has varying effects on task performance (Sim & Nicholas, 2014; Williams & Harkins, 1979; Fang & Chang, 2014; Mefoh & Nwanosike, 2012; Hass, 2017; Latane, Williams, & Harkins, 1979). Studies especially working on Nigerian samples seem to be scanty. We thus expect that participants in loafing condition would differ from those in non-loafing condition on cognitive task performance (Hypothesis 1). Another factor that has the potentiality to affect cognitive tasks performance by college student is collective orientation. Many academic assignments and tasks can only be accomplished in groups, and many group tasks are collective tasks that require the individual members' collective orientation. Collective orientation which can be understood as the mutual interdependence of team members (Driskell & Salas, 1992; Driskell, Salas, & Hughes, 2010) has frequently been positively correlated to effective team outcome (Eby & Dobbins, 1998; Stout, Driskell, & Salas, 1997). Chiao (2017) defined collective orientation as a situation where an individual or group see and describe themselves based on the groups they belong to. These people might maintain a life-long affiliation with any group, such as family, high school peers, etc, but the point is they are in it for life. Individuals who are collectively oriented think of themselves and the group as one interdependent system, accomplishing their tasks together with the help of all members, while individuals who are less collectively oriented are much more autonomous in their decision making, viewing themselves and the other group members as individual and separate (Oyserman, Coon, & Kemmelmeier, 2002).

Collective orientation lays emphasis on cohesiveness and togetherness among individuals and prioritization of the group over self. Individuals or groups that ascribe to a collectivistic worldview tend to find common values and goals as more important (Schwartz, 1990), and demonstrate greater orientation toward in-group ranging from the nuclear family to peers, sport team, academic class, and religious or racial/ethnic group (Hui, 1988). Studies support that collectivism shows a consistent association with personal and social values, achievement motivation and task performance (Markus & Kitayama, 1991), patterns of interaction, cognition, perception and self-control (Brewer & Venaik, 2011). Individuals who endorse a high degree of collective orientation are characterized as being embedded in their group contexts and prioritizing group/communal goals over individual goals (Knight & Nisbett, 2007).

Thürmer, Wieber and Gollwitzer (2017) conducted two separate experiments examined the reasoning that collective orientation influences task performance among groups. Study 1 showed that the collective orientation group acted more cooperatively and performed better on a physical persistence task than the individualistic orientation and control groups. To confirm the causal role of collective orientation in persistence task performance, experiment 2 used the same persistence task and allowed groups to communicate with their group members. When communication was hindered, the collective orientation group performed worse than the individualistic orientation and control groups. It was concluded by the study that collective orientation enhances group goal achievement among adolescents.

Pieterse, van Knippenberg and van Ginkel (2010) evaluated the effects of diversity in collective and goal orientation on group performance among a Dutch sample (98 male and female adolescents) aged 15-18 years. The study found that the effect of diversity in collective orientation on task performance was significant, and this result was mediated by group information sharing and group efficiency. Graham, Sonne and Bray (2014) explored the effects of belief in group thought on task performance by school children. It was reported that pupils who are high on group thought correctly assembled more parts of the puzzle than those who rank low on group thought. In another study, Englert, Zwemmer, Bertrams and Oudejans (2015), sought to understand the role of collective mindset in group cooperation and job performance among primary six pupils in Aragon, Spain. The study's result found that pupils who ranked high on collectivism performed poorly on academic task compared with those who rank low on collectivism. Again, Graham, Bray and Ginis (2014) also found that student who hold a collective orientation mindset performed very poorly on puzzle arrangement while those who scored high on individualistic mindset scored higher in the number of puzzles correctly fixed.

In general, some studies have implicated the role of collective orientation on cognitive task performance (Graham, Sonne, & Bray, 2014; Thumer, Wieber, & Gollwiezer, 2017) whereas others deny the relationship (Englert, Zwemmer, Bertrams, & Oudejans, 2015; Graham, Bray, & Ginis, 2014). The inconsistent results garnered from the various studies forms the relevance of this present study

as the researchers aim to understand if collective orientation could affect cognitive task performance in the Nigerian context. We therefore anticipate that participants who score higher on collective orientation ranking will differ from those who score low on cognitive task performance (Hypothesis 2).

Extant literature has shown self-efficacy as a major factor implicated in cognitive task performance (Bandura, 1988). According to Bandura (1977), self-efficacy refers to the extent to which people believe they can start, and complete a given task with or without the assistance of another person. It is people's judgments of their capabilities to organize and execute courses of action independently. Self-efficacy deals with an individual's self-evaluation of their capabilities for certain action or behaviour and the effort needed to overcome any obstacles in exhibiting such behaviour. According to Graham (2011), the act of individuals making judgment on their capabilities gives an insight into how people make decisions to engage in a task independently. Bandura (1997) postulates that, self-efficacy determines the willingness of a person to perform certain tasks. Chan, Kalliath, Brough, O'Driscoll, Siu and Timms (2017) support the notion that self-efficacy may influence task performance by an individual.

One's sense of self-efficacy can play a major role in how one approaches goals, tasks, and challenges. Because self-efficacy is developed from external experiences and self-perception and is influential in determining the outcome of many events, it represents the personal perception of external social factors such as peers and groups and how it affects his/her reactions to challenges (Kwak & Bandura, 1998). According to Bandura (1998), people with high self-efficacy are more likely to view difficult tasks as something to be mastered rather than something to be avoided even though they may be working on the task as an individual or as a group. In two studies, Ouweneel and Schaufeli (2013) adopted a subgroup approach and created a natural setting in Study 1 and manipulated self-efficacy level in study 2 subgroups based upon their change in self-efficacy over time and examined whether these subgroups showed similar changes over time in task performance. The results of both studies confirmed that students' increases/decreases in self-efficacy were related to corresponding increases/decreases in their study task performance over time. In another study, Sitzmann and Yeo (2013) conducted a meta-analytic investigation of the within- person self-efficacy domain and sought to know whether self-efficacy was a product of past performance or a driver of future performance. The study result showed that past performance on a task increases self-efficacy, which in turn leads to greater performances in more difficult tasks in the future. Vancouver, Gullekson, Morse and Warren (2014) in their study found that students who were high on learning and performance self-efficacy reported less stress while learning and solving cognitive tasks than those who rank low on self-efficacy.

In a 2015 study, Duncan, Fowler, George, Joyce and Hankey found that low level of self-efficacy leads to mental fatigue which was negatively related with cognitive task performance by school pupils. Graham (2015) sought to advance the understanding of self-regulation and self- control of exercise behaviour in two separate studies. Study 1 showed that self-control depletion leads to reductions in task self-efficacy, while study 2 revealed that self-efficacy predicted poor performance in cognitive exercises. Locke, Lee, Fredrick and Bobko (2014) examined effect of self-efficacy, goals and task strategies on task performance among junior secondary school students. The study result revealed that self-efficacy did not influence task performance. That is, students who were high on self-efficacy ranking did not differ from those who were low on the construct when their performances were rated. Overall, self-efficacy is positively and strongly related to task-related performance; Obstacles often stimulate people with high self-efficacy to greater efforts, where someone with low self-efficacy will tend toward discouragement and giving up; a person with high self-efficacy will attribute failure to external factors, where a person with low self-efficacy will blame failure on low ability. For example, someone with high self-efficacy with regard to puzzle fixing may attribute a poor test grade to a harder-than-usual test, illness, lack of effort, or insufficient preparation. A person with a low self-efficacy will attribute the result to poor schematic ability (Jongen, 2015). We anticipate that participants who rank high on self-efficacy will differ from those who rank low on cognitive task performance (Hypothesis 3).

Method

Participants in this study were 80 Senior Secondary School (SS2) students (40 males and 40 females) selected from Community Secondary School Ugbene-Ajima in Uzo-Uwani Local Government Area of Enugu State, using stratified random sampling. The sample was drawn from the total population of ninety-two (92) SS 2 students. Their ages ranged from 15 to 18 years, with mean age of 16.8years (*SD* = .98).

Instruments

Materials for this study were Driskell, Salas and Hughes' (2010) Collective Orientation Scale; Chen, and Gully and Eden's (2001) New General Self-efficacy Scale, while cognitive task performance was measured as the number of pieces of a puzzle participant correctly fits.

Collective Orientation Scale (COS

To assess an individual's Collective Orientation level, the Driskell, Salas, and Hughes' (2010) collective orientation scale was employed. It is a scale rated on a 5-point Likert response format, ranging from 1 (Definitely agree) to 5 (definitely disagree). It was developed to evaluate how individuals feel about working in team settings. The developed scale was specific to evaluate collective orientation factors which helped in predicting team interdependence and team task performance. The collective orientation scale consists of 15 items which are divided into two main factors. The first factor, composed of 10 items, is used to measure affiliation and the second factor, composed of 5 items, evaluates dominance. A collectively oriented person is one who has a high affiliation score and a low dominance score (Driskell et al., 2010). Driskell et al (2010) reported

that the 15-item scale demonstrated acceptable internal consistency, with a Cronbach's alpha of .85, as did the subscales, with alphas of .85 and .75 for the Affiliation and Dominance subscales, respectively. Examples of items in the COS are, "When solving a problem, it is very important to make your own decision and stick by it.", "I find working on team projects to be very satisfying.", "I prefer to complete a task from beginning to end with no assistance from others.", 'I always ask for information from others before making any important decision". For the present study, the Collective Orientation Scale yielded a Cronbach's alpha of .80 which was an acceptable internal consistency reliability index.

New General Self-efficacy Scale (NGSES)

The NGSES developed by Chen, Gully and Eden (2001) was used to assess participants' perceptions of their general abilities across different tasks and situations. The scale consists of 8 items rated on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). All the scale items are directly scored and an individual's possible total score ranges from 8-40 with higher scores implying high level of self-efficacy while lower scores indicate low self-efficacy. An example item is: "I am confident I can perform effectively on many different tasks". Chen et al. (2001) reported an internal consistency alpha of .82 for the NGSS. For the present study, the NGSES yielded a Cronbach's alpha of .79 which was an acceptable internal consistency reliability value.

The material used for the measurement of cognitive task performance was a coloured giraffe toy that has on each side 26 pieces alphabets/numbers respectively. Participants were tasked with assembling the puzzle, which is a relatively simple task that does not require much experience. Cognitive task performance was measured as the number of pieces of a puzzle participant correctly fits. It ranges from 1-26 with high scores indicating better performance on the task (vice-versa).

Procedure

On arrival, participants were told that they would be helping to find a solution to a problem within 10 minutes, and that participation was voluntary. All the students present indicated interest to participate in the study. After the selection of the sample, the students were assigned to the two groups (non-social loafing and social loafing) through a simple random selection technique. These were done by assigning numbers 1 to 80 to participants, and participants with odd numbers were pulled to one group and vice versa. Each group was made up of 40 participants (20 Males, 20 Females). Group 1 was the No-loafing condition while Group 2 was the loafing condition. Prior to the commencement of the experiment, the collective orientation and the self-efficacy scales were administered to all the participants in each condition and participants responded as it applied to them individually within ten minutes. Social loafing was manipulated by varying the information given to the two groups concerning task performance. The No-loafing condition received the following instruction:

You are welcome to this experiment; your task is to fix the coloured giraffe puzzle on your desk, concentrate on your work and do not talk to any person as you work.

The Loafing condition (group 2) was instructed as follows:

"*You are welcome to this experiment; your task is to work in a group to fix the coloured giraffe puzzle at the center of the table. The puzzle is 40 pieces and while each of you will be working on a puzzle, you are expected to work together to complete the puzzles".*

Prior to the commencement of the experiment, the researchers arranged a laboratory where each participant had a desk on which the giraffe puzzle was placed. Each desk was tagged against a participant in reverse order 1 to 80 to control the influence of the participants knowing that the researchers marked their desk for identification. The No-loafing group sat individually with the giraffe puzzle placed on their desk and with strict supervision. While the social loafing condition worked in a group of 40. The participants were invited into the laboratory and after the experimenter read the instruction, the experimenter left the laboratory and returned after 10 minutes and instructed the participants to stand and leave the laboratory. Using the reversed codes identification numbers, the researchers picked the puzzle and recorded the scores. Participants were scored by counting the pieces of the giraffe puzzle correctly fixed over 26. At the end of the experiment, the participants were fully debriefed on the true purpose of the study. All participants were treated in accordance with APA ethical standards.

Design/Statistics

The study adopted a 2x2x2 factorial design. The three factors were social loafing (social loafing versus no-loafing), Collective Orientation (high versus low collective orientation), and self-efficacy (high versus low). Analysis of variance (ANOVA) statistic was used to analyze the study data in the Statistical Package for the Social Sciences (SPSS).

Results

Table 1 showed that students in the No-loafing group had a task performance score of 14.58 (SD = 6.52) while those in the Loafing group had a mean score of 8.38 (SD = 3.89). For collective orientation groups, those with low collective orientation obtained an average task performance score of 12.63 (SD = 8.50) while those with high collective orientation had a mean score of 11.29 (SD = 2.17). Students with low self-efficacy had a mean task performance score of 5.11 (SD = 3.58) while students with high self-efficacy had a mean task performance score of 12.28 (SD = 5.98).

Table 1: Descriptive statistics for cognitive task performance scores by social loafing, collective orientation and self-efficacy groups

Variable	Value Label	*N*	Mean	*SD*
Social Loafing	Nonloafing group	40	14.58	6.52
	Loafing group	40	8.38	3.89
Collective orientation	Low	11	12.63	8.50
	High	69	11.29	2.17
Self-Efficacy	Low	9	5.11	3.58
	High	71	12.28	5.98

Table 2: Tests of between subject effects of social loafing, collective orientation and self-efficacy on cognitive task performance

Source	Type III Sum of Squares	*DF*	Mean Square	*F*	Partial Eta Squared
Social Loafing (SL)	131.20	1	131.20	6.70*	.09
Collective orientation (CO)	7.46	1	7.46	.38	.01
Self-Efficacy (SE)	274.11	1	274.11	13.99**	.16
SL * CO	26.03	1	26.03	1.33	.02
SL * SE	76.10	1	76.10	3.89*	.05
CO * SE	22.84	1	22.84	1.17	.02
SL * CO * SE	.10	1	.10	.01	.00
Error	1410.01	72	19.58		
Total	13552.00	80			
Corrected Total	3017.95	79			

Table 2 showed a significant main effect of social loafing on task performance, $F(1, 72) = 6.70$, $p \leq .05$. Those in the no-loafing group had higher task performance scores ($M = 14.58$, $SD = 6.52$) than those in the loafing group ($M = 8.38$, $SD = 3.89$). The effect size of .09 indicates that about 9% of the variance in cognitive task performance was explained by social loafing.

There was no main effect of collective orientation on task performance, ($p>.05$). The task performance scores of those with low collective orientation ($M = 12.63$, $SD = 8.50$) did not differ significantly from the task performance scores of those with high collective orientation ($M = 11.29$, $SD = 2.17$). The effect size of .01 indicates that about 1% of the variance in cognitive task performance was explained by collective orientation.

It was further shown that self-efficacy had a significant main effect on cognitive task performance, $F(1, 72) = 13.99$, $p< .001$. Those with low self-efficacy had lower task performance scores ($M = 5.11$, $SD = 3.58$) than those with high self-efficacy ($M = 12.28$, $SD = 5.98$). The effect size of .16 indicates that about 16% of the variance in task performance was explained by self-efficacy.

The interaction effect between social loafing and collective orientation on task performance was not significant ($p>.05$). There was a significant interaction effect of social loafing and self-efficacy on task performance, $F(1, 72) = 3.89$, $p < .05$, with an effect size of .05. The slope of the interaction (See Figure 1 Below) showed that those in the No-loafing group with low self-efficacy had lower task performance scores ($M = 5.43$, $SD = 3.69$) compared to those in the No-loafing group with high self-efficacy ($M = 16.52$, $SD = 5.20$). Similarly, those in the Loafing group with low self-efficacy group had lower task performance scores ($M = 4.00$, $SD = 4.24$) than those in Loafing group with high self-efficacy group ($M = 8.60$, $SD = 3.80$).

Figure 1: Slope of the interaction effect of social loafing and self-efficacy on task performance

Discussion

This study examined the effect of social loafing, collective orientation and self efficacy on adolescent's cognitive task performance among senior secondary school students. The first hypothesis which stated that participants in the no social loafing condition would perform better than participants in the social loafing condition on the cognitive task was confirmed. This finding is consistent with previous studies (e.g., Mefoh & Nwanosike, 2012; Karau & Williams, 1995; Kravitz & Martin, 1986; Price & Harrison, 2006; Weldon & Gargano, 1988) showing that social loafing engenders negative consequences that affect groups. Like in most of those studies the observation made in this experiment could be related to the theory of diffusion of responsibility. People working alone think they are personally responsible for task outcome; but when they work in groups this feeling of responsibility diffuses to others. In this experiment, participants were led to believe that their scores would be added together to those of other participants to arrive at the group's total score. Because of an individual's presence in a group of large size, some people often feel that their efforts are not needed or will not be recognized (Kerr,1989).

The result of this study did not confirm the second hypothesis which stated that participants with high collective orientation would significantly perform better on the cognitive task than those participants with low collective orientation. Collective orientation had no main significant effect on cognitive task performance such that the task performance scores of participants with low collective orientation did not differ from the task performance scores of those with high collective orientation on cognitive task performance. This finding is consistent with previous studies (e.g., Graham, Bray, & Ginis, 2014; Englert, Zwemner, Bertrans, & Oudejans, 2015; Thumer, Wieber, & Gollwitxer, 2017). Previous research (Masuda & Nisbett, 2001; Graham, Sonne, & Bray 2014) had shown a positive relationship between collective orientation and cognitive task performance. The variance in the finding of this study and previous reports could be as a result of individual personal orientation, geographical settings as well as variance in learning ability.

The third hypothesis which stated that participants with high self-efficacy would perform significantly better on the cognitive task than those with low self-efficacy was supported in this study, as self-efficacy had a significant main effect on cognitive task performance. Those with low self-efficacy had lower task performance scores than those with high self-efficacy on cognitive task performance. Thus, an individual's perception of his general ability across task has a significant main impact on cognitive task performance. The result of this study is consistent with previous findings (Ouweneel & Schaufeli, 2013; Sitzmann & Yeo, 2013; Vancouver, Gullekson, Morse, & Warren, 2014; Duncan, Fowler, George, Joyce, & Hankey, 2015; Baumeister, 2014; Graham, 2015; Locke, Lee, Fredrick, & Bobko, 2014) that students increase/decrease in self-efficacy were related to corresponding increase/decrease in cognitive task performance.

Interaction effect was also considered in this study. There was no significant interaction effect of social loafing and collective orientation on cognitive task performance. It can be argued that social loafing is more likely to occur when teams lack cohesiveness and are less aware of their individual and collective performance outcomes (Driskell, Radtke, & Salas, 2003). However, there is a significant interaction of social loafing and self efficacy on cognitive task performance. Possible explanation could be that participant's levels of self-efficacy have a significant impact on student's changes in behaviour when performing a cognitive task. The interaction effect of collective orientation and self efficacy was not significant. The three-way interaction effect of social loafing, collective orientation and self- efficacy was not significant.

This study is not without limitations. Apart from the small number of participants involved in this study as well as using only one class of students (SS2), the study also used a between subject design with each group comprising of forty (40) participants. Collective orientation and self-efficacy were not also manipulated. If the following limitations were considered, it is possible that different results would have emerged from the study. Thus, subsequent studies should consider a larger number of participants, variety in classes of students and other designs such as within subject design.

Conclusion

The findings of this study have provided some insights on how social loafing, individuals level of self efficacy and collective orientation manifests itself within interacting groups during a cognitive task. Besides adding to the "maturing" field, this research has some implications for practitioners by further examining team performance, and specifically how social loafing plays out among team members when performing a cognitive task. By this, the findings may be beneficial to schools and team builders because they provide better understanding of factors that could minimize performance in groups while performing a cognitive task.

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