Journal of Sport & Exercise Psychology, 2021, 43, 105-114
https://doi.org/10.1123/jsep.2020-0085

Human Kinetics
ORIGINAL RESEARCH

Attenuation of the Köhler Effect in Racially Dissimilar Partnered Exercise Reversed Using Team Identity Strategy

Tayo Moss,[1] Stephen Samendinger,[2] Norbert L. Kerr,[1] Joseph Cesario,[1] Alan L. Smith,[1] Deborah J. Johnson,[1] and Deborah L. Feltz[1]
[1]Michigan State University; [2]SUNY-Farmingdale

The authors describe two research experiments exploring the influence of race on the Köhler motivation gain effect with exercise tasks. Experiment 1 tested whether partner racial dissimilarity affects individual performance. Experiment 2 created a team identity recategorization intervention to potentially counter the influence on performance observed in Experiment 1. White male participants were partnered with either a Black or Asian partner (Experiment 1) or with a Black partner utilizing team names and shirt colors as a team identity recategorization strategy (Experiment 2). Racially dissimilar dyads completed two sets of abdominal plank exercises with a Köhler conjunctive task paradigm (stronger partner; team performance outcome dependent upon the weaker-ability participant's performance). The results of Experiment 1 suggest attenuation of the previously successful group motivation gain effect in the racially dissimilar condition. The simple recategorization strategy utilized in Experiment 2 appeared to reverse motivation losses under conjunctive-task conditions in racially dissimilar exercise dyads.

Keywords: dyads, exercise motivation, racial stereotypes, social identity, team strategies

Individual motivation within groups has been an important topic in sport training and physical activity contexts. Some research has shown that working out with a partner or in a group enhances motivation to exercise (e.g., Feltz et al., 2011). However, there may be situations where individuals exert less effort when exercising in a group than when working individually, such as when individuals do not see their contributions as being instrumental to the team outcome, evaluate their teammates as too superior to keep up with, or feel less identified with the group. This phenomenon has been labeled social loafing (Karau & Williams, 1993). Understanding how motivation in groups (partners in particular) affects individual performance, and under which conditions, is important to help sustain physical activity and to improve training and performance efforts.

The Köhler Motivation Gain Effect in Groups

One approach to improving individual motivation in groups is the Köhler motivation gain effect (KMGE; Köhler, 1926). The KMGE occurs when a team member exerts more effort when paired with a more capable partner than when performing individually (Weber & Hertel, 2007). The KMGE is strongest in conjunctive team conditions, in which the team's potential productivity is equal to the productivity of its least capable member (i.e., the "weak link"). The phenomenon is attributed to Otto Köhler, who noted that performance on a physical task (biceps curls) by weaker rowers was better when their efforts were yoked to stronger rowers (Köhler, 1926). The rowers individually lifted 41-kg weights in synchrony with a metronome, and this number of curls was compared with their efforts when a shared 82-kg weight was used. Köhler's dyads were randomly paired, and he noticed that the optimal weaker–stronger partner performance, after examining all of the individual and yoked sessions, was achieved when the stronger member of the group was moderately better (approximately 33%) than the weaker member (Witte, 1989). Köhler studied the dynamics of group productivity but did not comment on the motivational effect that may have occurred. Unfortunately, Köhler's work went unnoticed over six decades, and it was Witte (1989) who explained the historic importance of Köhler's initial lifting experiment as one of the few early studies to demonstrate that working in a group could encourage exercise motivation.

This motivational increase, or "motivation gain" phenomenon, is inferred through increases in performance effort. It is thought to stem from upward social comparison (i.e., the tendency to be motivated to exceed the performance of one's more capable partner) and indispensability (i.e., the contingency between one's own performance and other valued outcomes, such as good group performance and positive social evaluations; Kerr et al., 2007). Thus, in conjunctive task conditions, where the team's performance is based on the performance of its least capable member, the weakest member is indispensable to the team's outcome. The implications of this indispensability to team performance on conjunctive tasks is important because the more the weakest team member's performance can be improved the better the team-level performance. In terms of practicality, there may be more room for improvement of weaker group members' efforts for overall group performance than for the strongest group members because of "ceiling" or maximum performance limits (Hüffmeier et al., 2017).

The Köhler phenomenon has been shown in a meta-analysis of 17 Köhler effect studies to be a reliable positive motivation gain effect ($g = 0.72$; Weber & Hertel, 2007). The KMGE also has been established as a robust phenomenon in group exercise contexts using exergames (Samendinger et al., 2020). However, there are conditions that can moderate the KMGE and some in particular involve characteristics of the partner, such as partner ability (Feltz et al.,

Moss, Kerr, Cesario, Smith, Johnson and Feltz are with Michigan State University, East Lansing, MI, USA. Samendinger is with SUNY-Farmingdale, East Farmingdale, NY, USA. Moss (mosstayo@gmail.com) is corresponding author.

2012), age (Feltz et al., 2014), and gender (Lount et al., 2000). For instance, males working with a higher ability female enhanced the effect (Lount et al., 2000), while individuals working with a partner who was very superior in ability undermined it (Feltz et al., 2012). In the first instance, teaming up with a dissimilarly gendered partner may heighten the individual's concern for self-presentation or competitiveness. In this case, males could have been influenced by a stereotype belief that females are not as strong as males, and thus if a female outperforms them, it is a threat to their perception of masculinity. In the second instance, teaming up with a much stronger partner might have lessened the weaker partner's sense of group identity with that partner because of such a large perceived difference in ability and, thus, reduce the weaker partner's sense of obligation or indispensability to the group outcome (Kerr & Hertel, 2011).

In addition to partner characteristics of gender and age, perception of one's partner as being from other social categories (i.e., out-groups) to which a person does not psychologically identify (e.g., race, culture, religion) has also been suggested to moderate the KMGE (Kerr & Hertel, 2011). Heightened concern for self-presentation or competitiveness might lead to higher motivation gains when partnered with a more capable out-group member versus when partnered with a more capable in-group member. However, exercising with an out-group member could also lead to lower motivation because of reduced social identity and sense of obligation to that partner, based on social identity theory (Tajfel & Turner, 1986). In the literature on helping behaviors, there is evidence that people are more likely to offer help to in-group members than they are to out-group members (Levine et al., 2005). In terms of the KMGE, Irwin and Thompson (2016) found no enhanced benefit for participants exercising with a stronger partner from a rival university (i.e., out-group) compared with a partner from one's own university (i.e., in-group); both conditions showed the KMGE, though the in-group partner actually demonstrated a slightly higher benefit. Of course, it is possible that one's university affiliation is not as strong as other social category identities in terms of influencing motivation in partnered exercise.

In-Group/Out-Group Social Categorization Based on Race

Race may provide a stronger social category identity with which to examine the effects of in-group/out-group characteristics on the KMGE. Research has shown that individuals are less inclined to work in teams with members who are racially dissimilar to themselves (e.g., Hinds et al., 2000). Thus, race may be a more meaningful social identity in the context of physical exercise than one's university affiliation, particularly with Black and White men in the United States. One stereotype about Black males is that they are athletically stronger than White males (Moskowitz & Carter, 2018; Sheldon et al., 2007). The social category of race leads to several questions regarding the KMGE. For example, would White males paired with a moderately stronger Black male partner (out-group member) on a muscular endurance task work harder to support their own social category identity? Or, would factors such as the salience of the athletic prowess stereotype negatively influence the social identity with that partner and reduce his sense of indispensability or obligation to the team effort? Would effects be different with a racially dissimilar partner who did not carry an athletic prowess stereotype? If supporting one's own social category identity was the more salient factor, then the performance effort with a racially-dissimilar partner should be similar with or without an athletic prowess stereotype. In addition, if White participants had a negative stereotype of any racially dissimilar partner's athletic ability but were shown to be weaker in their own performance, they may be more motivated to increase their efforts. This might suggest a "stereotype lift" effect: performance boosted by awareness that an out-group is negatively stereotyped (Walton & Cohen, 2003).

Finally, if the pairing of a stronger Black partner with a weaker White partner reduces the KMGE, can a more inclusive social categorization of team identity be made more salient to replace one's racially based social identity? Finding the answers to these questions is important, not only to build understanding of the boundary conditions of the KMGE, but also on a more practical level to determine how much racial diversity affects partnered exercise environments. For instance, the utility of the KMGE in exergames would be limited if partners had to be very similar in their social categorizations.

The last question regarding a more inclusive social categorization hinges on the concept of recategorization for reducing out-group bias. Recategorization is designed to "structure a definition of group categorization at a higher level of category inclusiveness in ways that reduce intergroup bias and conflict" (Gaertner et al., 2000, p. 102). For instance, making in-group members aware that members of an out-group are similar to one's own group on a different dimension can assist in improving intergroup attitudes (Urban & Miller, 1998). An additional recategorization strategy is to increase the salience of in-group–out-group memberships by introducing factors, such as common goals, which may lead to common in-group identity (Allport, 1954). When recategorization strategies strengthen a common in-group identity, the motivational processes that produced in-group favoritism now benefit the relationship with the former out-group members who currently share the superordinate group identity (Gaertner et al., 2000). A recategorization strategy with partnered out-group members that would lead to a more favorable KMGE would not only enhance weaker exercise team members' performances but overall team performance.

This paper comprises two research experiments that extend prior research by exploring race as a potential moderator of the KMGE, and testing a recategorization intervention using a group dynamics approach to increase physical exercise. The first experiment extends prior research that used exergames to explore whether partner racial dissimilarity moderates individual performance. The second experiment employs a recategorization intervention to allow individuals within a dyadic group to overlook potential racial differences to achieve a team objective. We chose to use only White male participants as the weaker team member as a starting point for this research to reduce design complexity, acknowledging that the dynamics might be different for minority in-group/out-group weaker members.

Experiment 1: Does Partner Race Moderate the Köhler effect?

The purpose of the first experiment was to investigate the motivational effects of racial dissimilarity in a conjunctive group task. In particular, we explored the question of whether stereotypic views about performance might impact one's motivation on a taxing physical task—one that requires muscular endurance. Based on previous work within the KMGE paradigm investigating partnering with an out-group member, as well as research on stereotypes about Black males and their athletic ability, we hypothesized that White male participants with a stronger Black partner would demonstrate significantly less exercise persistence compared with participants

with a stronger White partner under conjunctive-task conditions. We also included a stronger Asian partner condition for exploratory purposes to examine the performance effects of a racially dissimilar partner who was less likely to be perceived as athletically stronger.

Method

Participants

Undergraduate White males ($N = 89$) from a Midwestern university ($M_{age} = 19.82$; $SD = 1.50$) participated in the study for either course credit or $10 in cash. Compensation was not tied to performance. Students were recruited using a university research participant recruitment system. The study was advertised as a research project to examine the effect of exercise video games on exercise behavior.

Participants were randomly assigned into one of the three experimental conditions: White conjunctive partner (WP), Black conjunctive partner (BP), and Asian conjunctive partner (AP).

Experimental Task

Following previous KMGE research, the experimental task involved holding a series of five abdominal planks for as long as possible within an exercise video game (exergame) designed for the PlayStation 2 gaming module using EyeToy: Kinetic software (Feltz et al., 2011; Forlenza et al., 2012; Irwin & Thompson, 2016). These types of exercises are ideal for studying motivation gains and losses because the planks are mostly effort based, and little individual skill or team coordination is needed. There was a 30-s break between each exercise. In addition, each series of plank exercises was performed twice, with a 10-min break period between Blocks 1 and 2.

Participants completed a front plank, two side planks (left and right), and two one-legged planks (left and right) on an exercise mat. For the first exercise, participants were face down on the mat, with legs straight, and they raised their body by placing elbows and toes on the mat. This allowed participants to use their abdominals to elevate and lift their body. The legs, back, and neck should be all in line for this exercise. During the task, the experimenter was in constant communication with the participant ensuring proper planking technique by providing posture guidance, such as "keeping elbows in line with shoulders" and "not letting your hips sag to the ground." Comparable to the front plank, side planks required the body to be elevated from the mat. Participants arranged their body and propped themselves up with their right or left forearm so that their body formed a diagonal line. Finally, the one-legged planks were similar to the front plank, except either the right or left leg was raised in the air; thus, the participant performed these with only the left or right foot firmly on the ground.

Procedure

Institutional review board approval was obtained from Michigan State University before the study was conducted. Before each session, informed consent was obtained and the experimenter confirmed the participant was free of hindering injuries to their arms, shoulders, back, or legs. Afterward, the participants watched a 9-min video that explained the experimental procedures and the plank exercises, and then were given the opportunity to ask questions about the experimental protocol. Participants were not told the exact number of trials they would be performing, but only that they would perform a series of trials. After completing a self-efficacy questionnaire, the first performance block of plank exercises was completed individually. During the 10-min break, all participants were given feedback from the experimenter on their performance (i.e., the average number of seconds they held each exercise). After the rest break, participants met their partner, completed a second self-efficacy questionnaire, and then completed Block 2 with the partnered manipulations (WP, BP, and AP). After Block 2 was completed, additional questionnaires were administered (enjoyment, self-efficacy, team identity, implicit attitudes test [IAT], and participants' perceptions of partner's ability), and participants were verbally debriefed.

Partnered Manipulations

All procedures were identical, except for the race of the partner, across the three conjunctive partner conditions (WP, BP, and AP). During the 10-min break following Block 1, each participant was told that the exercises would be completed again, but this time with another male partner. Moreover, participants were told that their partner was in another lab, connected with audio and video via the internet and were led to believe they were interacting live with another person. However, their partner was actually a prerecorded confederate. Participants in all three partnered conditions were given an opportunity to meet their partner through a simulated Web camera-like connection and exchange basic information (e.g., name, hometown, what you like to do for fun). Aside from differing racial appearance, the script of the prerecorded partners' comments was identical for all three partners during the partner interaction, and all three confederates were of similar height and weight.

After this brief interaction, the participant was informed that the second block of exercises would be completed with the partner as a teammate and that the team score would be defined as the score of the person who stopped holding the exercise first (i.e., conjunctive task setting). Also, in line with previous studies, participants were given bogus feedback on how well the partner had done on the first trial. The stronger partner's Block 1 plank score was always stated as a time calculated to be 40% better than the participant's Block 1 score, which creates an unfavorable social comparison yet keeps the task engaging and allows the participant to set an achievable goal (Feltz et al., 2011, 2012). For instance, if the participant held his position for an average of 60 s on Block 1, he was told that his partner had averaged 84 s. This moderate discrepancy (40%) in ability between partners has been shown to be optimal for producing the KMGE with this task (Feltz et al., 2012).

Measures

Persistence. The primary outcome variable of exercise persistence was operationalized as the length of time, measured in seconds, that the plank exercises were held, starting from when participants moved into position until the moment that they quit. To calculate the block scores, the experimenter summed the length of time each individual plank exercise was held.

Enjoyment. Enjoyment was measured with the eight-item version of the Physical Activity Enjoyment Scale (Raedeke, 2007) following the completion of the experiment. This instrument consists of a primary stem, "Please rate how you currently feel about the physical activity you have been doing according to the following scales": followed by the items structured on a 1–7 bipolar scale (e.g., 1 = *I loved it*, 7 = *I hated it*; 1 = *I found it pleasurable*, 7 = *I found it unpleasurable*). An adequate Cronbach's alpha was obtained ($\alpha = .90$) with our sample.

Team Identity. Participants in all three conditions completed a five-item questionnaire that assessed their perceptions of their working relationship with their partner. Participants rated a series of statements (e.g., "I felt like I was part of a team"; "I thought of my partner as a teammate") on a 9-point Likert scale (1 = *strongly disagree*, 9 = *strongly agree*), with responses averaged to produce a scale score, consistent with past research (Moss et al., 2018; Samendinger et al., 2019). An adequate Cronbach's alpha was obtained for the team perception index with our sample (α = .81).

Self-Efficacy Beliefs. As a measure of self-efficacy, participants recorded, at three separate time points, how many seconds they believed they were completely confident they could hold each of the five planks. Consistent with past research, a sum of the five estimated times for each assessment was calculated as the self-efficacy score (Feltz et al., 2011, 2014).

Perceptions of Partner's Ability. Participants also estimated their ability relative to their partner's by responding to the question: "How do you feel compared to your partner?" (1 = *much less capable*, 9 = *much more capable*). We created this measure to explore whether or not participants perceived their partner's ability in holding plank exercises differently depending on their partner's race.

Implicit Association Test. Forsyth (2010) pointed out that an in-group–out-group bias may work on a subtle and unintentional or even unconscious level. Furthermore, there are strong social desirability biases that can undermine the validity of direct measures of stereotype beliefs. For both reasons, an indirect measure of the association of race with physical strength was employed, viz. an Implicit Association Test (IAT) to examine the association between race and strength in the sample. More extensive detail on the IAT is found in the first end note.[1]

Analysis of Data

The primary dependent variable (plank persistence score differences between Block 2 and Block 1) was analyzed with a set of planned orthogonal contrasts, comparing each of the partnered conditions to the other. Cohen effect sizes, with confidence intervals, were calculated for all significant findings. For all ancillary analyses, a one-way analysis of variance (ANOVA) by Condition was utilized. An a priori power analysis was conducted with G*Power 3 (Faul et al., 2007). For a condition main effect, the results of the power analysis showed that with three conditions, 84 participants would be sufficient to obtain a medium effect size of $f = 0.35$ with a power of 0.80 and an alpha level of .05. This effect size is consistent with prior KMGE research, in which similar methods were utilized (Samendinger et al., 2015).

Results

Primary Analysis: Exercise Persistence

The primary dependent variable was the difference score between both blocks (Block 2 – Block 1). The use of a difference score controls for individual differences in task ability and motivation. Although difference scores can lower power if the two measures are not highly correlated, this was not the case with our Block 1 and Block 2 mean plank times, $r(89) = .79$; $p < .001$. Previous studies in this line of research have found consistent patterns between ANOVAs on difference scores and analysis of covariances on Block 2 scores with Block 1 scores as a covariate (e.g., Feltz et al., 2011; Forlenza et al., 2012). Because the difference score means are more directly interpretable than adjusted means produced by analysis of covariance, the difference score analysis is presented. To test the main study hypotheses, a series of planned comparisons was undertaken on the Block 2 – Block 1 difference scores (see Figure 1). There was a significant difference in scores between the WP ($M = 10.66$; $SD = 57.14$) and BP conditions ($M = -19.11$; $SD = 55.97$), $t(57) = 2.02$, $p = .048$, which resulted in a moderate effect size, $d = 0.53$; 95% confidence interval (CI) [0.00, 1.04]. This finding aligns with our hypothesis that participants in the BP condition would put forth less effort in the second block of exercises compared with participants in the WP condition. There was no significant difference in exercise persistence between the

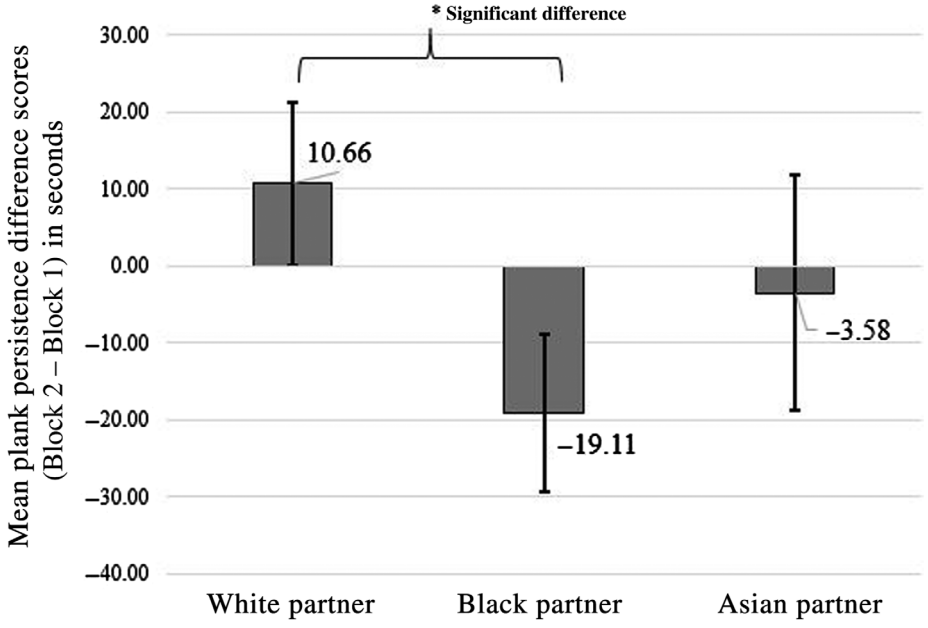

Figure 1 — Mean difference scores on persistence (Block 2 – Block 1) in seconds by partner condition with *SE* bars. $^{*}p < .05$.

WP condition and AP condition ($M = -3.58$; $SD = 83.96$), $t(51) = .76$, $p = .449$.

Ancillary Analyses

In terms of enjoyment (see Table 1), a one-way ANOVA by Condition was not significant, $F(2, 82) = 2.92$, $p = .059$. Participants in the WP ($M = 4.05$; $SD = 0.61$) condition did not seem to enjoy exercising with a partner of their own race any more compared with the BP partner ($M = 3.79$; $SD = 0.50$) or AP ($M = 3.75$; $SD = 0.43$), despite plank performance differences. A one-way ANOVA by Condition on the team identity index, was not significant, $F(2, 81) = 0.87$, $p = .42$ (Grand $M = 4.33$; $SE = 0.17$). Participants thought of themselves somewhat as a team. Likewise, there was no significant difference in self-efficacy (see Table 2) between conditions for each of the three measurement points, Fs(2, 82) = 1.02, 0.24, and 0.48; ps > .62 (Time 1: $M = 55.96$ s, $SD = 32.16$; Time 2: $M = 45.55$ s, $SD = 21.26$; Time 3: $M = 34.26$ s, $SD = 17.34$). In addition, there were no differences among conditions in perceived partner ability, $F(2, 82) = 0.98$; $p = .38$. Participants in all conditions rated their partner as more capable in ability ($M = 2.44$; $SD = 1.16$).

In terms of implicit associations between strength and different racial groups for the White–Black IAT, positive D scores indicated that participants exhibited moderate associations between Black and strong (relative to White and weak: $M = 0.40$; $SD = 0.33$), confirming the stereotypes in the expected direction. For the Asian IA, the D scores were low and negative ($M = -0.15$; $SD = 0.36$), meaning that respondents had a slight association with Asian and weak. Unfortunately, not enough data were useable ($n = 45$) to examine if IAT moderated performance effects.[2]

Discussion of Study 1

The purpose of this study was to investigate the motivational implications of partner racial dissimilarity within the KMGE paradigm. Unlike previous research using male/female partners, where male participants worked harder with a stronger female than with another male (Lount et al., 2000), White participants who exercised with a Black partner (out-group member) persisted significantly less than participants who exercised with a White partner (in-group member). There was no such significant decline for White participants paired with an Asian partner, suggesting that participants were not sensitive to racial dissimilarity, per se, but to having a Black partner, in particular. But having such a partner did not result in a lower level of team identification. Furthermore, there were no condition differences in perceptions of the partner's comparative ability. That is, participants did not report that they thought their Black partner was any more capable (therefore not physically comparable) than those in the WP and AP conditions. Nor can the findings be explained by differences in participants' self-efficacy beliefs. This was unsurprising; it has been the typical pattern for most of the research on KMGE in physical exercise contexts (Samendinger et al., 2020).

Racially dissimilarity, per se, was not a motivating factor for White participants to work harder to support their own social category identity. This would have resulted in greater persistence with both Black and Asian partners, which was clearly not observed. Although the IAT results showed that the sample held a slight association between Asian and weak, there did not appear to be a "stereotype lift" (Walton & Cohen, 2003) boosting White participants' efforts to work harder with an Asian partner than those paired with a White partner. Perhaps, if White males held a strong negative stereotype of a group's athletic prowess, researchers might see this type of lift, such as Lount et al. (2000) found with strong female partners.

While as a group, White participants did not make statements suggesting their Black partners were stronger than they were, the IAT responses suggest that the sample did indeed associate Black with strong, but they did not make that association with Asian and strong. This association of Black and strong could support a stereotype belief explanation that White participants might have acted on their implicit perception of their Black partner as being too strong for them to be engaged and challenged by the goal of keeping up with him, which may have seemed less achievable than those with a White partner.

However, another explanation could be that White participants felt less engaged and obligated to help their Black partner in the team effort than did those with a White partner, and this may have led to lower persistence. That is, the type of task and perceived ability stereotype may have been irrelevant. Regardless of whether an athletic prowess stereotype of Black men negatively influenced White men's ability to socially compare or compete with their Black partner or negatively influenced their sense of obligation to the team effort, perhaps another social identity categorization could

Table 1 Study 1 Ancillary Measures by Condition, *M* (*SD*)

Measure	BP	WP	AP
Enjoyment	3.79 (0.50)	4.05 (0.61)	3.75 (0.43)
Team identity	4.37 (1.54)	4.59 (1.58)	4.03 (1.54)
Partner ability	2.37 (1.25)	2.68 (0.98)	2.26 (1.16)

Note. AP = Asian conjunctive partner; BP = Black conjunctive partner; WP = White conjunctive partner.

Table 2 Study 1 Self-Efficacy in Seconds by Condition and Time, *M* (*SD*)

Time	BP	WP	AP	Total
Time 1 (before Block 1 planks)	52.67 (26.96)	52.48 (36.76)	63.26 (32.16)	55.96 (32.16)
Time 2 (before Block 2 planks)	44.13 (19.38)	44.86 (24.32)	47.85 (20.45)	45.55 (21.26)
Time 3 (after Block 2 planks)	32.39 (14.56)	33.83 (19.69)	36.88 (17.34)	34.26 (17.34)

Note. AP = Asian conjunctive partner; BP = Black conjunctive partner; WP = White conjunctive partner.

be emphasized that supersedes one's racial identity to build a motivating shared team identity.

Experiment 2: Does a Recategorization Strategy Reduce Social-Category Out-Group Biases in the Köhler Effect?

Using the same experimental exercise task, Experiment 2 was concerned with facilitating group cooperation between individuals from different racial backgrounds. Specifically, the aim of this experiment was to explore a recategorization strategy that emphasized team identity over racial identity to boost feelings of indispensability toward the team performance that might otherwise be attenuated by the unfavorable social comparison with a stronger Black partner.

Previous research (Moss et al., 2018) using partners who were not racially dissimilar incorporated a strategy to enhance team identity, in which participants in partnered groups were told to wear same-colored t-shirts and were assigned team names. This team identity strategy resulted in significant increases in persistence compared with a control condition. We used a similar strategy in Experiment 2 to test whether pairing White participants with a stronger Black partner would boost performance compared with not using this enhanced team identity strategy, as well as compared with an individual control (IC) condition. We hypothesized that participants in the Black partner condition with added team identity (BPI) would have a significantly greater motivation gain (i.e., a greater increase or smaller decrease in exercise persistence) compared with those in the Black partner only (BP) condition. Furthermore, we expected that both BPI and BP would have a significant motivation gain compared with those in the IC group. Past KMGE research has shown that performing with a more capable conjunctive partner, even a dissimilar one, enhances performance compared with performing alone (Samendinger et al., 2020).

Method

Participants

Participants included 87 undergraduate White males from a Midwestern university who participated in the study for course credit and were recruited from the same university recruitment system as in Experiment 1. Due to participant recruitment issues that became more difficult as the semester was ending, seven White male IC participants from a previous study (Moss et al., 2018) were randomly selected and added, post hoc, to the current 20 IC participants to make the IC sample size 27. This addition brought the total sample more in line with power analysis, which was the same as that used in Experiment 1. There is precedent for this approach in other studies (e.g., Kerr et al., 2013). The lab setting, participant pool, and procedures for data collection were the same for IC participants in the current study as in Moss et al. (2018). Participants were randomly assigned into one of the three experimental conditions: BP ($n = 29$), BPI ($n = 31$), and IC ($n = 27$). Mean age of the total sample was 20.11 ($SD = 0.36$).

Procedure

The procedures were the same as those used in Experiment 1 for the first trial block. During the 10-min rest break, all participants were given feedback from the experimenter on their performance (i.e., the average number of seconds they held each exercise). After the break, Block 2 involved partnered manipulations (BP and BPI) or IC. After the completion of Block 2, and administration of questionnaires, participants were verbally debriefed.

Partnered Manipulations

Individual Control. During the 10-min break period, participants in the IC were instructed to wait patiently for further instructions. After a few minutes, participants were told they would complete the same set of exercises again after the end of the break. Following the break period, participants were given a brief synopsis of the protocol immediately before performing Block 2, which was in the same sequence as Block 1.

Conjunctive Partner (BP and BPI). The procedures for the two conjunctive partner conditions (e.g., BP and BPI) were identical except for the recategorization intervention. Similar to Experiment 1, during the 10-min break following Block 1, the participants were told that the exercises would be completed again, but this time with another male partner. Moreover, participants were told that their partner was in another lab, connected via the Internet. However, their partner was actually the same prerecorded confederate that we used in the BP condition for Experiment 1. Participants in both partnered conditions were given an opportunity to meet their partner and exchange basic information (e.g., name, hometown, what you like to do for fun) through a Web camera-like connection. After this brief interaction, the participant was informed that the second block of exercises would be completed with the partner as a teammate and that the team score would be defined as the score of the person who stopped holding the exercise first. Just as in Experiment 1, each participant was given veridical feedback on his Block 1 plank score and his partner's Block 1 plank score, which was always stated as 40% better than the participant's score.

In the BPI condition, we incorporated a recategorization intervention based on Moss et al. (2018) to create a common identity for participants and their partner to help reduce potential out-group biases. During the break before Block 2, the experimenter mentioned to the participant that his partner would choose a team shirt for the two of them to wear to represent the team's identity. The confederate partner always chose red. The experimenter then gave the participant a red shirt to match his partner's. After donning the team shirts, participants were asked to choose a team name out of 20 options (e.g., Dragons, Bears, Vipers) to represent their team for Block 2.

Measures

The measures were the same as those used in Experiment 1 with one exception. We did not include the IAT because our short-term intervention was primarily focused on enhancing team identity rather than reducing implicit bias.

Analysis of Data

The primary dependent variable (plank persistence score differences between Block 2 and Block 1) and all ancillary variables were analyzed with a one-way ANOVA by Condition. Cohen effect sizes, with confidence intervals, were calculated for all significant findings. As with Experiment 1, an a priori power analysis was conducted with G*Power 3 (Faul et al., 2007). For a condition main effect, the results of the power analysis showed

that with three conditions, 84 participants would be sufficient to obtain a medium effect size of $f = 0.35$ with a power of 0.80 and an alpha level of .05.

Results

Primary Analysis: Exercise Persistence

First, the Block 2 – Block 1 difference scores showed no significant difference between the seven randomly selected males ($M = -46.94$; $SD = 45.72$) from the IC condition in Moss et al. (2018) and the 20 new participants ($M = -130.28$; $SD = 107.74$) in that group, $t(25) = -1.97$; $p = .06$. Block 2 – Block 1 difference scores were again used to test the main study hypotheses using a one-way ANOVA (Figure 2). Significant differences were noted in plank block difference scores among the BPI ($M = 16.72$; $SD = 47.87$), the BP ($M = -35.30$; $SD = 64.78$), and the IC conditions ($M = -108.68$; $SD = 101.74$), $F(2, 84) = 20.99$; $p < .001$. Post hoc follow-up tests using the Tukey procedure indicated that the BPI group persisted significantly longer than the BP group, $p < .021$; $d = 0.92$; 95% CI [0.37, 1.44]. Moreover, participants in BPI, $d = 1.6$; 95% CI [1.00, 2.18], and BP, $d = 0.87$; 95% CI [0.31, 1.40], group persisted significantly longer than those in the IC group ($ps < .001$). These results align with our main hypotheses that participants in the partnered conditions (BP and BPI) would have a significant motivation gain compared with the control condition, and that participants in the team identity partnered condition (BPI) would have a significant motivation gain compared with the participants in the (BP) condition.

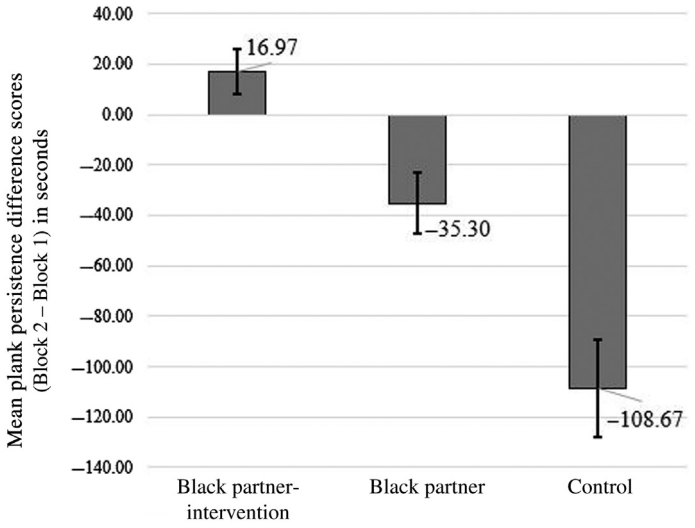

Figure 2 — Mean difference scores on persistence (Block 2 – Block 1) in seconds by partner condition with *SE* bars. *Note*. All condition comparisons were statistically significant.

Ancillary Analyses

In terms of enjoyment (see Table 3), a one-way ANOVA by Condition was not significant, $F(2, 84) = 2.57$; $p = .083$, but all groups reported high enjoyment ($M_{BPI} = 4.76$, $SD = 0.87$; $M_{BP} = 4.92$, $SD = 0.94$; $M_{IC} = 4.41$, $SD = 0.72$). An independent samples t test on the team identity index was not significant, $t(58) = -1.25$; $p = .22$. Participants in both partnered conditions perceived being a part of a team ($M_{BPI} = 5.08$, $SD = 1.72$; $M_{BP} = 4.55$, $SD = 1.56$), at least moderately so. Likewise, there was no significant difference in self-efficacy (see Table 4) between conditions for each measurement point Fs(2, 83) = 0.38, 0.42, and 0.76; ps > .47 (Time 1: $M = 56.46$ s, $SD = 27.58$; Time 2: $M = 43.44$ s, $SD = 18.52$; Time 3: $M = 34.54$ s, $SD = 15.7$). Finally, an independent samples t test on the one-item perceived partner ability was not significant, $t(58) = -.715$; $p = .48$ ($M_{BPI} = 2.16$, $SD = 0.97$; $M_{BP} = 2.00$, $SD = 0.76$).

Discussion of Study 2

The aim of Experiment 2 was to explore a possible a solution to the attenuation of the KMGE observed in racially dissimilar partnered exercise. Finding a solution that would lead to a more favorable KMGE would enhance not only weaker team members' performances but overall team performance when individuals are partnered with out-group members in conjunctive group exercise tasks. Our strategy was to enhance the salience of team identity and

Table 3 Study 2 Ancillary Measures by Condition, *M* (*SD*)

Measure	BP	BPI	IC
Enjoyment	4.92 (0.43)	4.76 (0.87)	4.41 (0.72)
Team identity	4.55 (1.56)	5.08 (1.72)	—
Partner ability	2.00 (0.76)	2.16 (0.97)	—

Note. BP = Black conjunctive partner; BPI = Black partner condition with added team identity; IC = individual control.

Table 4 Study 2 Self-Efficacy in Seconds by Condition and Time, *M* (*SD*)

Time	BP	BPI	IC	Total
Time 1 (before Block 1 planks)	59.29 (28.21)	53.18 (28.68)	57.20 (26.14)	56.46 (27.58)
Time 2 (before Block 2 planks)	44.04 (21.07)	42.69 (18.14)	43.65 (16.52)	43.44 (18.52)
Time 3 (after Block 2 planks)	32.35 (13.57)	34.09 (13.16)	37.52 (20.21)	34.54 (15.7)

Note. BP = Black conjunctive partner; BPI = Black partner condition with added team identity; IC = individual control.

teamwork over in-group social identity using a social recategorization-based solution (Gaertner et al., 2000).

The findings supported our main hypothesis that participants in the BPI condition would perform significantly better than participants in the other two conditions (BP and IC). In Experiment 1, we found that White participants might have acted on an implicit perception of their Black partner as being too strong to keep up with him on a challenging physical task. These results occurred even though the Black partner was not any stronger than the White or Asian partner, and all participants reported that they felt like they were part of a team. Results in Experiment 2 support this view. However, the incorporated team identity intervention aided in improving exercise persistence difference scores. The BPI group's persistence increase was comparable ($M = 3.34$) to those who performed with a White partner in Experiment 1 ($M = 2.79$). Simply being allowed to choose a team name and wear the same color team shirt eliminated the fatigue effect in Trial Block 2 and significantly improved performance scores from the first block compared with ICs. Even though there were no self-reported differences in perceptions of being a team between the BPI and BP groups, we argue that our intervention may have aided in enhancing the participant's strength in social identification with their partner. It is possible that the team identification operated at a more implicit level (Devos et al., 2012). Furthermore, the self-report item, "I feel part of a team" may have been too general to capture the nature of even short-term team identity. Perhaps the BPI participants felt more "ingroup ties" (i.e., a sense of commonality and connectedness with their partner; Cameron, 2004). These simple strategies may have created an environment that increased the salience of the team task and the participant's social identity as a teammate.

Participants may have heightened the sense of obligation to not let their partner down when they had a team name and team shirt. Any increased attention on team identity features (i.e., team name and t-shirt) may have been enough to at least temporarily overcome intergroup biases that stem from surface-level diversity perceptions (Harrison et al., 1998) and permit the comparison and obligation mechanisms believed to be at the core of the KMGE. Research in work groups exploring the effect of surface-level diversity (i.e., relations, bio, or demographic diversity) has failed to demonstrate a consistent relationship with performance in a variety of contexts and task conditions (Horwitz & Horwitz, 2007; Stahl et al., 2010). However, there has not been work on surface-level diversity perceptions in interdependent exercise task settings, particularly when bias may be linked to judgements of physical ability. It also may be that utilizing game-like features, such as competition with another dyad team, may serve to enhance the sense of team identity and enjoyment, despite exerting more effort compared with no-partner conditions (Moss et al., 2018).

Our results also support previous findings that performing with a stronger partner, under conjunctive task conditions, regardless of dissimilarities with that partner, is better than having no partner at all (Samendinger et al., 2020). The KMGE was evident in both the BP and BPI groups in that participants fatigued less compared with those in the IC group who performed the second trial block alone.

General Discussion

The two experiments presented in this paper expanded previous KMGE research by examining racial dissimilarity as a moderator of motivation effects within a dyadic conjunctive task in group exercise contexts. The underlying mechanisms for the KMGE are that (a) a weaker group member upwardly compares performance with that of a partner (social comparison mechanism), and/or (b) a weaker group member appreciates that their efforts are key to the group performance (indispensability mechanism; Kerr et al., 2007). Experiment 1 results showed that in the BP condition, participants had less of a motivational gain than those in the WP condition, which may have been due to a stereotype belief that Blacks are stronger athletically and thus keeping up with a BP would seem unachievable. Thus, the BP may not have been as relevant a social comparison partner as the WP, and there may have been insufficient sense of team identity to feel as indispensable to the BP as the WP.

Experiment 2 showed that a simple team intervention helped to reduce motivation losses in White participants with Black partners. The intervention was intended to create an intergroup structure that fosters an enhanced team identity between group members to create a more inclusive, superordinate representation of the group (Dovidio & Gaertner, 1999). Our results suggest that White men will increase their efforts with Black partners when they are given techniques that enhance their team awareness as compared with exercising alone or without the intervention. This type of intervention may be a plausible method for reducing both traditional and contemporary forms of prejudice, as well as stereotype assumptions (Dovidio & Gaertner, 1999). Research suggests implicit bias issues are potential sources of uneasiness in organizational settings (Tsui & Gutek, 1999). Our experimental model may be useful in reducing uneasiness by assisting racially dissimilar teams in generating a common in-group identity. The findings suggest that there are simple applied strategies to enhance performance motivation in White/Black dyad situations (e.g., working together in a two-person bobsled event, carrying a piece of military weaponry that requires two people, etc.) by creating a greater sense of team identity. Future research should examine how recategorization techniques may enhance the team identity of a dyadic group in applied, real-world circumstances.

The primary limitation for our experiments is that we included only White male participants. Therefore, we were not able to make comparisons to participants in other racial and gender categories. In addition, our task was limited to a muscular endurance task. Other tasks might not invoke a stereotype belief that Black males are stronger athletically, and we would, therefore, not expect the same results. Future research could employ our same paradigm with Black and White confederate partners using an effort-based persistence task that is not based on muscular strength (e.g., a balance task or hand-steadiness task) compared with our plank exercises. Moreover, our participants were young and healthy college students and may have had different cultural viewpoints than other cohort groups. For example, older adults may show findings that suggest a higher sense of ethnocentrism (i.e., negative attitude toward individuals unlike oneself; Nosek et al., 2007), which could impact outcomes within our experimental paradigm. Beyond these limitations, we conducted this research in a controlled laboratory setting, which may affect external reliability in applied settings. Unlike research environments, organizational settings may provide constant reinforcement of demographic differences, which can contribute to stress associated with diversity (Tsui & Gutek, 1999). This could render ineffective the simple recategorization technique that we used here. Multiple social factors in nonlab settings may also influence performance-related diversity concerns in exercise, sport, or work dyads. Furthermore, the strategies utilized in our experiments were short-lived, and may have different implications if the partners interacted for a longer period of time. Future research may need to compare the pattern of results found in our experiments to settings outside of the laboratory.

These limitations acknowledged, the present experiments are valuable to the knowledgebase. They demonstrate the KMGE can be attenuated in racially dissimilar partnered exercise where race is potentially a cue to performers of lesser or greater capability. Moreover, they demonstrate that this attenuation can be addressed through a simple team identity recategorization strategy. This advances our understanding of motivation in groups as tied to exercise contexts, and as such, meaningfully extends the exercise psychology literature.

Notes

1. Previous research has used an IAT to assess the association between a social category and some evaluation or trait of interest (Arkes & Tetlock, 2004). Within our study, the procedure for those in the BP condition involved viewing five pictures each of White and Black faces as the primes. Participants in the AP condition viewed White and Asian faces, while those in the WP condition were randomly assigned to the White/Black or White/Asian face primes. The targets or "words" were adjectives in relation to physical strength (e.g., muscular) or weakness (e.g., frail) connotations that were paired with the faces. Participants had to push either the key labeled strong or the one labeled weak as fast as possible. The test consisted of three blocks of 20 practice trials each followed by a 40 trial test block for strong words paired with Black faces (weak with White faces). Then the pairing was switched (i.e., strong with White), and two practice blocks were administered, followed by another 40 trial test block. The same procedure was used for Asian and White faces. Previous research incorporating this IAT to assess racial attitudes has found that White participants were quicker to respond to good words for White faces and quicker to respond to the bad words for Black faces (Fazio et al., 1995). We used Greenwald et al.'s (2003) method to determine if there was a significant difference between the average length of time it took individuals to associate strong or weak words with Black or White by computing a statistic called the "*D* score." *D* is the difference between the average response latencies of the contrasted conditions (e.g., Black with strong/White with weak; White with strong/Black with weak) divided by the *SD* of response latencies across the conditions (distinct from the pooled within-conditions *SD*). As Greenwald et al. note, *D* is functionally an effect size assessment, at the participant level, that is similar to Cohen's *d*. *D* has a theoretical minimum of −2 and maximum of +2. Values further from 0 indicate greater associations. The computation of *D* is described in detail in the Greenwald et al. paper.

2. The experimenter had intermittent technical difficulties with the software program.

References

Allport, G.W. (1954). *The nature of prejudice*. Addison-Wesley.

Arkes, H.R., & Tetlock, P.E. (2004). Attributions of implicit prejudice, or "would Jesse Jackson 'fail' the Implicit Association Test?" *Psychological Inquiry, 15*(4), 257–278. doi:10.1207/s15327965pli1504_01

Cameron, J.E. (2004). A three-factor model of social identity. *Self and Identity, 3*(3), 239–262. doi:10.1080/13576500444000047

Devos, T., Huynh, Q.-L., & Banji, M.R. (2012). Implicit self and identity. In M.R. Leary& J.P. Tangney (Eds.), *Handbook of self and identity* (2nd ed., pp. 155–179). Guilford.

Dovidio, J.F., & Gaertner, S.L. (1999). Reducing prejudice: Combating intergroup biases. *Current Directions in Psychological Science, 8*(4), 101–105. doi:10.1111/1467-8721.00024

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191. PubMed ID: 17695343 doi:10.3758/BF03193146

Fazio, R.H., Jackson, J.R., Dunton, B.C., & Williams, C.J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology, 69*(6), 1013. PubMed ID: 8531054 doi:10.1037/0022-3514.69.6.1013

Feltz, D.L., Forlenza, S.T., Winn, B., & Kerr, N.L. (2014). Cyber buddy is better than no buddy: A test of the Köhler motivation effect in exergames. *Games for Health Journal, 3*(2), 98–105. PubMed ID: 26196051 doi:10.1089/g4h.2013.0088

Feltz, D.L., Irwin, B., & Kerr, N. (2012). Two-player partnered exergame for obesity prevention: Using discrepancy in players' abilities as a strategy to motivate physical activity. *Journal of Diabetes Science and Technology, 6*(4), 820. PubMed ID: 22920808 doi:10.1177/193229681200600413

Feltz, D.L., Kerr, N.L., & Irwin, B.C. (2011). Buddy up: The Köhler effect applied to health games. *Journal of Sport & Exercise Psychology, 33*(4), 506–526. PubMed ID: 21808077 doi:10.1123/jsep.33.4.506

Forlenza, S.T., Kerr, N.L., Irwin, B.C., & Feltz, D.L. (2012). Is my exercise partner similar enough? Partner characteristics as a moderator of the Köhler effect in exergames. *Games for Health Journal, 1*(6), 436–441. PubMed ID: 26192061 doi:10.1089/g4h.2012.0047

Forsyth, D.R. (2010). *Group dynamics*. Wadsworth Cengage Learning.

Gaertner, S.L., Dovidio, J.F., Banker, B.S., Houlette, M., Johnson, K.M., & McGlynn, E.A. (2000). Reducing intergroup conflict: From superordinate goals to decategorization, recategorization, and mutual differentiation. *Group Dynamics: Theory, Research, and Practice, 4*(1), 98. doi:10.1037/1089-2699.4.1.98

Greenwald, A.G., Nosek, B.A., & Banaji, M.R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*(2), 197. PubMed ID: 12916565 doi:10.1037/0022-3514.85.2.197

Harrison, D.A., Price, K.H., & Bell, M.P. (1998). Beyond relational demography: Time and the effects of surface-and deep-level diversity on work group cohesion. *Academy of Management Journal, 41*(1), 96–107. doi:10.2307/256901

Hinds, P.J., Carley, K.M., Krackhardt, D., & Wholey, D. (2000). Choosing work group members: Balancing similarity, competence, and familiarity. *Organizational Behavior and Human Decision Processes, 81*(2), 226–251. PubMed ID: 10706815 doi:10.1006/obhd.1999.2875

Horwitz, S.K., & Horwitz, I.B. (2007). The effects of team diversity on team outcomes: A meta-analytic review of team demography. *Journal of Management, 33*(6), 987–1015. doi:10.1177/0149206307308587

Hüffmeier, J., Filusch, M., Mazei, J., Hertel, G., Mojzisch, A., & Krumm, S. (2017). On the boundary conditions of effort losses and effort gains in action teams. *Journal of Applied Psychology, 102*(12), 1673. PubMed ID: 28749151 doi:10.1037/apl0000245

Irwin, B.C., & Thompson, N.S. (2016). The impact of social category diversity on motivation gains in exercise groups. *American Journal of Health Behavior, 40*(3), 332–340. PubMed ID: 27103412 doi:10.5993/AJHB.40.3.5

Karau, S.J., & Williams, K.D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology, 65*(4), 681. doi:10.1037/0022-3514.65.4.681

Kerr, N.L., Feltz, D.L., & Irwin, B.C. (2013). To pay or not to pay? Do extrinsic incentives alter the Köhler group motivation gain? *Group Processes and Intergroup Relations, 16*(2), 257–268. doi:10.1177/1368430212453632

Kerr, N.L., & Hertel, G. (2011). The Köhler group motivation gain: How to motivate the "weak links" in a group. *Social and Personality Psychology Compass, 5*(1), 43–55. doi:10.1111/j.1751-9004.2010.00333.x

Kerr, N.L., Messé, L.A., Seok, D.-H., Sambolec, E.J., Lount, R.B., & Park, E.S. (2007). Psychological mechanisms underlying the Köhler motivation gain. *Personality and Social Psychology Bulletin, 33*(6), 828–841. PubMed ID: 17475617 doi:10.1177/0146167207301020

Köhler, O. (1926). Kraftleistungen bei einzel- und gruppenabeit [Physical performance in individual and group situations]. *Industrielle Psychotechnik, 3,* 274–282.

Levine, M., Prosser, A., Evans, D., & Reicher, S. (2005). Identity and emergency intervention: How social group membership and inclusiveness of group boundaries shape helping behavior. *Personality and Social Psychology Bulletin, 31*(4), 443–453. PubMed ID: 15743980 doi:10.1177/0146167204271651

Lount, R.B., Jr., Messé, L.A., & Kerr, N.L. (2000). Trying harder for different reasons: Conjunctivity and sex differences as bases for motivation gains in performing groups. *Zeitschrift für Sozialpsychologie, 31*(4), 221–230. doi:10.1024//0044-3514.31.4.221

Moskowitz, G.B., & Carter, D. (2018). Confirmation bias and the stereotype of the black athlete. *Psychology of Sport and Exercise, 36,* 139–146. doi:10.1016/j.psychsport.2018.02.010

Moss, T., Feltz, D.L., Kerr, N.L., Winn, B., Smith, A.L., & Spencer, B. (2018). Intergroup competition in exergames: Further tests of the Köhler motivation effect. *Games for Health Journal, 7*(4), 240–245. PubMed ID: 29958003 doi:10.1089/g4h.2017.0122

Nosek, B.A., Smyth, F.L., Hansen, J.J., Devos, T., Lindner, N.M., Ranganath, K.A., … Banaji, M.R. (2007). Pervasiveness and correlates of implicit attitudes and stereotypes. *European Review of Social Psychology, 18*(1), 36–88. doi:10.1080/10463280701489053

Raedeke, T.D. (2007). The relationship between enjoyment and affective responses to exercise. *Journal of Applied Sport Psychology, 19*(1), 105–115. doi:10.1080/10413200601113638

Samendinger, S., Beckles, J., Forlenza, S.T., Pfeiffer, K.A., & Feltz, D.L. (2015). Partner weight as a moderator of exercise motivation in an obese sample. *Medical Research Archives,* (3). doi:10.18103/mra.v0i3.277

Samendinger, S., Hill, C.R., Kerr, N.L., Winn, B., Ede, A., Pivarnik, J.M., … Feltz, D.L. (2019). Group dynamics motivation to increase exercise intensity with a virtual partner. *Journal of Sport and Health Science, 8*(3), 289–297. PubMed ID: 31193273 doi:10.1016/j.jshs.2018.08.003

Samendinger, S., Max, E., Feltz, D.L., & Kerr, N.L. (2020). Back to the future: The Köhler motivation gain in exergames. In S.J. Karau (Eds.), *Individual motivation within groups: Social loafing and motivation gains in work, academic, and sports teams* (pp. 149–190). Academic Press.

Sheldon, J.P., Jayaratne, T.E., & Petty, E.M. (2007). White Americans' genetic explanations for a perceived race difference in athleticism: The relation to prejudice toward and stereotyping of Blacks. *Athletic Insight, 9*(3), 31–56.

Stahl, G.K., Maznevski, M.L., Voigt, A., & Jonsen, K. (2010). Unraveling the effects of cultural diversity in teams: A meta-analysis of research on multicultural work groups. *Journal of International Business Studies, 41*(4), 690–709. doi:10.1057/jibs.2009.85

Tajfel, H., & Turner, J.C. (1986). The social identity theory of intergroup behavior. In S. Worchel& W.G. Austin (Eds.), *Psychology of intergroup relations* (pp. 7–24). Nelson-Hall.

Tsui, A.S., & Gutek, B.A. (1999). *Demographic differences in organizations: Current research and future directions*. Lexington Books.

Urban, L.M., & Miller, N. (1998). A theoretical analysis of crossed categorization effects: A meta-analysis. *Journal of Personality and Social Psychology, 74*(4), 894. doi:10.1037/0022-3514.74.4.894

Walton, G.M., & Cohen, G.L. (2003). Stereotype lift. *Journal of Experimental Social Psychology, 39*(5), 456–467. doi:10.1016/S0022-1031(03)00019-2

Weber, B., & Hertel, G. (2007). Motivation gains of inferior group members: A meta-analytical review. *Journal of Personality and Social Psychology, 93*(6), 973–993. PubMed ID: 18072849 doi:10.1037/0022-3514.93.6.973

Witte, E.H. (1989). Köhler rediscovered: The anti-Ringelmann effect. *European Journal of Social Psychology, 19*(2), 147–154. doi:10.1002/ejsp.2420190206