

---

# AN INVESTIGATION OF MOTIVATIONAL VARIABLES IN CROSSFIT FACILITIES

JULIE A. PARTRIDGE, BOBBI A. KNAPP, AND BRITTANY D. MASSENGALE

*Department of Kinesiology, Southern Illinois University, Carbondale, Illinois*

## ABSTRACT

Partridge, JA, Knapp, BA, and Massengale, BD. An investigation of motivational variables in CrossFit facilities. *J Strength Cond Res* 28(6): 1714–1721, 2014—CrossFit is a growing fitness trend in the United States; however, little systematic research has addressed specific motivational principles within this unique exercise environment. The purpose of the study was to explore the influence of gender and membership time on perceptions of motivational climate and goals within the CrossFit environment. Specifically, people may set goals related to self-improvement (i.e., mastery) or focus on their performance in comparison to others (i.e., performance). Motivational climate refers to an individual's perception of being encouraged to focus on either mastery or performance goals from CrossFit trainers. A total of 144 members (88 females; 56 males) completed questionnaires to assess participants' perceptions of CrossFit goal structures and perceptions of the motivational climate encouraged by the trainer within their CrossFit box. Results indicated a significant main effect for gender on preferred goals ( $p \leq 0.05$ ), with males reporting higher levels of performance approach goals and females reporting higher levels of master avoidance goals. Participants who reported shorter membership times were found to have significantly higher mastery-related goals than individuals who reported longer membership times ( $p \leq 0.05$ ). The results from the study suggest that practitioners should consider how perceptions of the motivational climate and goals in group-based exercise settings such as CrossFit may vary based on demographic variables, and that these differences may impact how to most effectively motivate, encourage, and instruct group members, particularly with regard to helping members set goals that most effectively address their approach to the CrossFit regimen.

**KEY WORDS** goal orientation, motivational climate, gender

---

Address correspondence to Julie A. Partridge, jpartrid@siu.edu.

28(6)/1714–1721

*Journal of Strength and Conditioning Research*

© 2014 National Strength and Conditioning Association

1714 <sup>the</sup>Journal of Strength and Conditioning Research<sup>®</sup>

## INTRODUCTION

Because of its focus on broad-based functional movements done at high intensity and its commitment to inclusivity, Rishe (31) of *Forbes Magazine* categorized CrossFit as “one of the fastest growing sports in America” (5). CrossFit programs attempt to develop competence in 10 fitness domains, including accuracy, agility, balance, coordination, cardiovascular and respiratory endurance, flexibility, power, speed, stamina, and strength (41). All members of a CrossFit box complete the same workout of the day (WOD) with the ability to scale the skill down if they are unable to complete a particular movement as prescribed. Workouts of the day are often comprised a range of movements that incorporate strength, endurance, metabolic conditioning, and power (1). The limited academic research which focuses on CrossFit has thus far focused on changes in fitness levels and body composition (36) and physiological changes due to specific movements (16). While group exercise experiences such as physical education classes (7) have been the focus of research studies on motivational factors in the past, the growing popularity, unique delivery style, and inclusive nature of this fitness model are the reasons why we chose to focus this exploratory research study within a CrossFit environment. Although conditioning programs such as CrossFit have received criticisms for increased potential injury among members (3), the research team was specifically interested in examining perceptions of motivational climate and achievement goals among CrossFit members(2).

Achievement goal theory (AGT) (29) is presently the predominant approach to the analysis of achievement motivation, and many studies have attempted to examine its principles in sport, physical education, and exercise settings (4,8,13). As Ames (1) noted, AGT allows one to study individuals in their environment, regardless if that environment is a sporting field or, as in the case of this study, a CrossFit box. The main principle of AGT is concerned with how individuals differentiate competence in an achievement setting. Competence, and therefore achievement goals, may be differentiated on 2 basic dimensions: according to how competence is defined and how it is valenced (14).

Competence is defined by the standard through which it is evaluated: mastery or performance (ego). Ego-involved individuals determine competence through evaluating their

performance against others, whereas the determination of competence from a mastery perspective is more self-referenced in such as when striving to develop a new skill or improve on a previous level of performance (11). Several factors that may influence achievement goal orientation have been examined in the literature, including practice/competitive contexts (18) and sport type (40). Two variables of interest that relate to this study are length of time participating in a sport and gender. Research has demonstrated that the longer people competed in a sport, the more likely they were to report high levels of ego orientation (22). Research on gender differences in goal orientations in sport has been more equivocal, with no strong goal patterns established. Hanrahan and Cerin (17) recently suggested, however, that many of these previous studies failed to account for potentially confounding variables such as level of participation and sport type. Their research revealed that females reported higher levels of task (mastery) orientation than their male counterparts.

Competence is also valenced in terms of approach or avoidance where approach goals are focused on achieving positive outcomes and avoidance goals are focused on avoiding negative outcomes. The valence dimension of competence has been integrated into the achievement goal literature by being crossed with the definition dimension to create a  $2 \times 2$  achievement goal framework (10,14,15).

The  $2 \times 2$  achievement goal framework comprises 4 distinct achievement goals: mastery approach (MAp: focused on achieving intrapersonal or task-based competence), performance approach (PAp: focused on achieving normative competence), mastery avoidance (MAv: focused on avoiding intrapersonal or task-based incompetence), and performance-avoidance (PAv: focused on avoiding normative incompetence). Moreover, in Elliot's framework (14), these 4 goals can be anteceded by a host of individual and situational factors such as perceived motivational climate, perceived competence and implicit theories about the nature of ability. In this study, we chose to focus on perceived motivational climate because it is a prominent construct in contemporary research on achievement motivation (35), yet has received little attention in adult exercise settings. Specifically, motivational climates are an important determining factor in the development of achievement goals and may also impact future voluntary participation (35) and anxiety (19).

The AGT states along with personal goal orientations that an individual may perceive 2 contrasting motivational climates (i.e., task- or ego-involving climate) (2). In a task-involving climate, an emphasis is placed on trying hard to master or improve skills, basing rewards on individual progress, and cooperative learning. Individuals participating in a task-oriented climate tend to adopt adaptive achievement strategies such as selecting challenging tasks, giving maximum effort, and persisting in the face of setbacks. Ego-involving climate, on the other hand, is characterized by

associating rewards to successful performance outcomes, public evaluation of skills, valuing of high ability to succeed, and interpersonal competition (23). Researchers have found that a task-oriented climate is associated with stronger mastery goal orientations in athletes and an ego-oriented climate with stronger performance orientations (19,34). A large body of research in both educational and sport settings indicates that task-involving climates are associated with better psychosocial and performance outcomes than are ego-involving climates (1).

Achievement goal theory remains a relatively untested theory in relation to achievement striving in exercise and fitness settings. Some researchers have questioned the applicability of the achievement goal framework to exercise, stating that in this context there are different reasons for individuals to participate other than the demonstration of competence (32). However, in the context of structured exercise undertaken in the presence of others, it is plausible that concerns about competence and incompetence are salient, just as in sport or physical education (27). The unique context of CrossFit and its emphasis on both intrapersonal- and interpersonal-based competition makes it an ideal setting within which to examine these motivational principles. Therefore, the purpose of this study was to examine perceived motivational climate and achievement goal orientations of CrossFit members. Specifically, we hypothesized that gender and membership time would impact goal orientations, specifically that males would report higher performance-based goals (i.e., PAp and PAv), whereas females would report higher mastery-based goals (i.e., MAp and MAv). Our second hypothesis was that longer membership times would lead to higher performance-based goals and shorter membership times would lead to higher mastery-based goals. We also hypothesized that gender and membership time at CrossFit would impact perceptions of the motivational climate such that longer membership times would be associated with greater perceptions of ego-involving climates.

## METHODS

### Experimental Approach to the Problem

*Demographic Questionnaire.* The demographic questionnaire was used to assess the members' demographic characteristics. The demographic questionnaire used in this study was constructed based on a model developed by the U.S. Census Bureau, which has been heavily field tested, and was used by one of the research team members during a previous study in a CrossFit facility. The questionnaire consists of 7 items, including racial category, sex, age, household income level, sexuality, education level, and length of membership at CrossFit.

*Achievement Goals Questionnaire for Sport.* The  $2 \times 2$  Achievement Goals Questionnaire for Sport (AGQ-S; 8) was used to assess participants' current achievement goals at CrossFit. The AGQ-S consists of 12 items which assesses MAp

(“It is important to me to perform as well as I possibly can”), MAv (“I worry that I may not perform as well as I possibly can”), PAp (“It is important to me to do well compared to others”), and PAv (“My goal is to avoid performing worse than everyone else”) achievement goals in sport. Participants were asked to consider their goal structure at the present time and to rate each item on a 7-point Likert scale (1 = not at all like me to 7 = completely like me). Previous studies using the AGQ-S have shown acceptable internal reliability, latent mean stability, and the construct validity factorial invariance over a 3-week period (8).

*Perceived Motivational Climate in Sport Questionnaire-2.* The Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; 28) was used to assess perceptions of the situationally emphasized goal perspective on the participants’ current workout facility. This questionnaire consists of 33 items broken into 6 subscales, to measure the degree to which the prevailing atmosphere on one’s team is deemed more or less of a task- or ego-involving climate. The subscales for task-involving climate include Cooperative Learning (“The athletes/members help each other to get better and excel”), Important Role (“Each athlete/member feels as if they are an important member of the box”), and Effort/Improvement (“The coach emphasizes always trying your best”). The subscales for the ego-involving climate include Punishment for Mistakes (“The coach gets mad when an athlete/member makes a mistake”), Unequal Recognition (“The coach gives most of his or her attention to the stars”), and Intra-Team Rivalry (“The coach praises athletes/members only when they outperform other members”). For each item, participants report how they feel each item sufficiently describes their particular team on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Previous studies conducted in sport and other physical activities have supported the reliability and factorial validity of the PMCSQ-2 (28).

### Subjects

Participants for this study included 144 members of 2 different CrossFit facilities in the Midwestern United States (88 females; 88 and 56 males). Age range for the participants was 18–71 years (mean = 34.4 years;  $SD = 11.8$ ). After scheduled classes for a 3-day period during the fall of 2012, CrossFit members were asked to participate in a study examining motivational factors. There were no incentives given for participating in the research. The Human Subjects Committee (HSC) at the authors’ university approved the study before the start of data collection. Because all participants were 18 or older, there was no need to obtain parental consent. The methods of the study were explained, and the individuals interested in participating in the study signed consent forms in accordance with HSC requirements. Only individuals who signed the informed consent form were allowed to participate in the study.

### Procedures

Approval was granted to conduct research by the owners/operators of 2 different CrossFit facilities. At the beginning of each scheduled class, an announcement was made to the members regarding the study, and members were instructed to meet with the researcher in the back of the class after their WOD if they were interested in participating in the study. After the workout, all interested participants signed informed consent forms before receiving the packet of 3 questionnaires to complete. To maintain confidentiality, each questionnaire packet had a distinctive identification number to indicate the facility from which the questionnaire was collected. Each survey packet consisted of 3 questionnaires, and the questionnaire order was counterbalanced to avoid any sequencing effects. Participants completed the questionnaires on site in an average of 15 minutes. At least one of the authors was present at all data collection dates to explain and collect informed consent forms, distribute and collect the questionnaire packets, and to answer any participants’ questions.

### Statistical Analyses

Descriptive statistics were calculated for the entire sample as well as by gender and membership time and can be found in Table 1. Internal consistency was calculated for each of the subscales used in the study. A median split was performed on the membership time data to establish 2 groups: those with more membership time at the specific CrossFit facility where they were recruited to participate and those with less time overall. The median was found to be 6 months. To assess the research questions, a 2-factor (gender  $\times$  membership time) multivariate analysis of variance (MANOVA) was used. Multivariate analysis of variance is used to examine the effect of 1 or more nonmetric independent variables on 2 or more metric dependent variables; therefore, a MANOVA was used to provide insights into the nature and predictive power of the independent measures (i.e., gender and membership time) as well as the interrelationships and differences in the multiple dependent measures (i.e., AGQ-S and PMCSQ-2 subscales). Another advantage of using a MANOVA is that it controls experiment-wide error rate by reducing inflated type I error. Multivariate analysis of variance was used to identify any gender  $\times$  membership time interactions and any main effects for gender and membership time. Partial  $\eta^2$  effect size (ES) statistics were calculated to determine the magnitude of observed significant differences. Effect sizes were assessed by the criteria of partial  $\eta^2 < 0.01$ , small; partial  $\eta^2 = 0.06$ , moderate; and partial  $\eta^2 > 0.14$ , large. The upper and lower 95% confidence intervals (CIs) associated with the average scores for each subscale are also reported in the Results.

### RESULTS

All variables were found to be normally distributed, and thus assumptions of linearity were not violated. The mean scores and  $SD$ s for gender and membership time of the AGQ-S and

**TABLE 1.** Overall measures of association, means, and SDs overall, by gender, and by membership time.†

Source	α	Overall		Females		Males		LMT		HMT	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Mastery approach	0.74	6.18	0.87	6.09	0.92	6.29	0.78	6.39*	0.71	5.97*	0.98
Mastery avoidance	0.87	4.93	1.46	5.11*	1.41	4.68*	1.52	5.15*	1.34	4.64*	1.57
Performance approach	0.90	4.24	1.58	4.13*	1.58	4.82*	1.51	4.60	1.49	4.19	1.66
Performance avoidance	0.86	4.14	1.67	4.17	1.76	4.11	1.52	4.33	1.68	3.88	1.64
Task-involving climate	0.82	4.50	0.39	4.52	0.38	4.44	0.41	4.50	0.40	4.48	0.39
Cooperative Learning	0.78	4.55	0.44	4.57	0.42	4.50	0.48	4.57	0.43	4.51	0.46
Important Role	0.75	4.38	0.64	4.44	0.68	4.25	0.55	4.37	0.73	4.36	0.52
Effort/improvement	0.74	4.55	0.38	4.56	0.36	4.52	0.40	4.55	0.39	4.55	0.35
Ego-involving climate	0.89	1.85	0.58	1.81	0.54	1.93	0.64	1.87	0.62	1.82	0.56
Punishment for Mistakes	0.74	1.52	0.55	1.68	0.48	1.60	0.64	1.55	0.58	1.48	0.50
Unequal Recognition	0.86	1.88	0.74	1.94	0.73	1.94	0.76	1.92	0.77	1.83	0.72
Intra-Team Rivalry	0.62	2.48	0.83	2.44	0.84	1.88	0.85	2.46	0.86	2.48	0.80

\*Significant difference  $p \leq 0.05$ .

†LMT = low membership time; HMT = high membership time.

PMCSQ-2 subscales were calculated and can be found in Table 1. The internal reliability of each of the subscales of the PMCSQ-2 and AGQ-S was calculated before continuing with further analyses of the data set. The internal reliability of each scale was assessed in relation to a Cronbach's alpha criterion of 0.70, which is generally considered to be an acceptable level of internal reliability in psychological research (39). All but 2 of the subscales achieved this criterion and were therefore included in all subsequent analyses. The 2 subscales that failed to reach the criterion of 0.70 for Cronbach's alpha were the PMCSQ-2 "Important Role" (0.558) and "Intra-Team Rivalry" (0.624). An item-total correlation analysis was performed to identify which, if any, items could be deleted to improve the reliability. After removing item 19 ("At this box, each athlete/member has an important role") from the "Important Role" subscale, the new Cronbach's alpha was 0.746; after removing item 6 (At this box, the coach praises athletes/members only when they outperform other members) from the "Intra-Team Rivalry" subscale, the new Cronbach's alpha was 0.730. The adjusted scales were then included in the subsequent analyses.

A MANOVA was used to examine the effect of 1 or more nonmetric independent variables on 2 or more metric dependent variables while reducing inflated type 1 error; therefore, a MANOVA was used to provide insights into the nature and predictive power of the independent measures (i.e., gender and membership time) and the interrelationships and differences in the multiple dependent measures (i.e., goal orientation and perceived motivational climate). Results from the 2-factor (gender  $\times$  membership time) MANOVA did not indicate a significant interaction (Wilk's  $\lambda = 0.869$ ,

$F_{(10,117)} = 1.758, p = 0.076$ , partial  $\eta^2 = 0.131$ ), which suggests that there are no significant differences in achievement goals and perceived motivational climate for males and females in respect to membership time. A multivariate gender main effect was identified; however, no main effect was found for membership time.

The MANOVA showed a significant main effect for gender (Wilk's  $\lambda = 0.741, F_{(20,234)} = 1.891, p = 0.014$ ) indicating significant differences between males and females. The ES (partial  $\eta^2 = 0.139$ ) indicated that the magnitude of the observed differences was large. Follow-up between-subject 1-way ANOVAs showed significant differences between gender for MAV Goals ( $F_{(2,126)} = 3.376, p = 0.037$ , partial  $\eta^2 = 0.051$ ) and PAP Goals ( $F_{(2,126)} = 3.455, p = 0.035$ , partial  $\eta^2 = 0.052$ ). Females reported higher levels of MAV goals (mean = 5.11 + 0.23,  $SD = 1.41$ , CI = 4.88–5.34) than male participants (mean = 4.68 + 0.25,  $SD = 1.52$ , CI = 4.43–4.93), whereas males reported higher levels of PAP goals (mean = 4.82 + 0.25,  $SD = 1.51$ , CI = 4.57–5.07) than female participants (mean = 4.13 + 0.26,  $SD = 1.58$ , CI = 3.87–4.39).

Results from the MANOVA failed to show a significant main effect for membership time (Wilk's  $\lambda = 0.880, F_{(10,117)} = 1.591, p = 0.117$ , partial  $\eta^2 = 0.120$ ); however, follow-up between-subject 1-way ANOVAs showed significant differences between membership times for MAP goals ( $F_{(1,126)} = 11.961, p = 0.001$ , partial  $\eta^2 = 0.087$ ) and MAV goals ( $F_{(1,126)} = 5.581, p = 0.020$ , partial  $\eta^2 = 0.042$ ). The partial  $\eta^2$  values indicated that the magnitude of the observed differences were moderate and small, respectively. Participants who were members of CrossFit for fewer than 6 months reported higher levels of both mastery-oriented goals (MAP: mean = 6.39 + 0.12,  $SD = 0.706$ , CI = 6.27–6.51; MAV: mean = 5.15

+ 0.22,  $SD = 1.34$ ,  $CI = 4.93-5.37$ ) than participants who were members for more than 6 months (MAP: mean = 5.97 + 0.16,  $SD = 0.976$ ,  $CI = 5.81-6.13$ ; MAV: mean = 4.64 + 0.26,  $SD = 1.57$ ,  $CI = 4.38-4.90$ ).

## DISCUSSION

This study examined the impact of membership time and gender on goal orientation and perceived motivational climate of CrossFit participants. We hypothesized that gender and membership time would impact goal orientations, specifically that males would report higher performance-based goals (i.e., PAp and PAv), whereas females would report higher mastery-based goals (i.e., MAP and MAV). Our second hypothesis was that longer membership times would lead to higher performance-based goals and shorter membership times would lead to higher mastery-based goals. We also hypothesized that gender and membership time at CrossFit would impact perceptions of the motivational climate such that longer membership times would be associated with greater perceptions of ego-involving climates.

Our first hypothesis was partially supported by the data. The MANOVA indicated that females reported higher levels of MAV goals, whereas males reported higher levels of PAp goals. This finding is consistent with the previous research that has suggested that women are more likely to adopt more mastery-based goals (42), and specifically that female athletes score higher on MAV goals (5). MAV goals represent a unique category within the  $2 \times 2$  framework proposed by Elliot and McGregor (15), wherein goals are defined in reference to the absolute standards of the task or one's own ability to attain the task and are negatively valenced. Therefore, the need to avoid looking incompetent or being unable to complete a WOD effectively would be an example of a MAV goal. Because of the heteronormative constructs of the feminine body in western culture, it is more common to see women expending energy in the cardiovascular room rather than the weight room in an effort to obtain the desired feminine body without becoming too bulky (12). Salvatore and Marecek (33) found that women are often underrepresented in weight-based exercise. Thus, many women are unfamiliar with weight lifting techniques and may even be intimidated by environments that include heavy weights, such as in a CrossFit facility (12). In interviews with CrossFit members, conducted for a qualitative study examining the reproduction and resistance of traditional gender norms in the CrossFit setting, Knapp (24) found that many of the female members had little to no previous experience with weight training. This lack of previous experience meant that many of the females were unfamiliar with proper lifting techniques and intimidated to lift a large amount of weight over their heads which may help to explain why females in this study were more likely to score higher on MAV goals. Furthermore, Elliot and McGregor (15) have suggested that MAV goals may be more likely among those individuals who

bring less than optimal motivational dispositions into achievement environments that foster intrinsic interest and the pursuit of a challenge.

Males in this study were found to be more likely to endorse PAp goals, which have been found to be associated with higher levels of performance, self-confidence, and self-concept in achievement domains (30,37). Males have been found to report higher levels of self-confidence and competence in the physical domain in numerous studies to date, particularly in situations that are considered more gender-appropriate or gender-stereotyped (25,38). Although CrossFit is marketed toward and encourages participation for both genders, the focus on strength training may still be seen as a more "masculine" activity, due to the persistent cultural belief that muscles equal masculinity (6,26). This perceived consistency between muscle development and masculinity results in weight training spaces as often being marked as masculine (20) which allows for males to develop more confidence in this area.

Our second hypothesis was also partially supported by the results, which indicated that participants who were members of a CrossFit gym for less than 6 months reported higher levels of both MAP and MAV goals than those who were members for greater than 6 months. Previous research in the sport domain has indicated that longer involvement leads to greater levels of ego orientation (22). Although this study was conducted in an exercise (rather than sport) setting, the higher levels of mastery-based goals among less-experienced CrossFit members suggests that level of experience in this particular exercise setting is associated with more self-directed goals. It is possible that as new members acclimate to the CrossFit environment, their primary goals must be focused on the gaining of new skills, training techniques, and intrapersonal improvements. In many instances, it takes participants' time to fully understand the terminology (such as many reps as possible) and movements (such as a squat clean) used in a CrossFit workout. In the beginning stages, participants are likely to be learning not only what comprises each prescribed movement but also the various ways one can scale such movements. Such demands on the novice CrossFitter may explain why those newer to the environment were more likely to have higher mastery-based goals.

Our third hypothesis was not supported by the results. There was no significant difference in perceptions of the motivational climate between less experienced and more experienced members. This suggests that while goals may change through experience at CrossFit, the perception of what is emphasized and rewarded within the climate does not. It is important to note that coaches have been found to have a significant influence on the perceived motivational climate in sport (21). Furthermore, these coaching influences have been found to influence levels of motivation across time (9), emphasizing the importance of this component within an achievement domain. Coaches operating at each CrossFit box may tend to maintain a consistent approach to

developing and creating the motivational climate, thus leading to little difference in the way that individuals perceive the climate in which they are asked to perform. CrossFit classes are structured such that both novices and more experienced members take classes together, which may necessitate coaches using a more consistent motivational and instructional approach to encourage a focus on self-improvement and personal challenge regardless of overall skill/experience level.

It is important to note that membership times for this study were relatively low overall, as both of the boxes that were sampled had opened within the past 2 years. As CrossFit continues to grow in popularity and members stay in these environments, motivational climate perceptions may begin to change. The methodology was also cross-sectional and therefore future research should explore more longitudinal methodologies to look more closely at the issue of whether motivational climate changes across time in CrossFit. Furthermore, previous research has indicated that goal orientations may differ between training and competition settings (40). It is possible that the current findings would not transfer to more competitive settings such as CrossFit Games competitions. Furthermore, although this study focused exclusively on CrossFit group exercise, future research should investigate whether these findings would be found in other group exercise settings (e.g., traditional group exercise classes such as aerobics or Zumba).

### PRACTICAL APPLICATIONS

The practical applications from this study are derived primarily from greater understanding of the goal orientations and perceptions of motivational climate in group exercise (specifically CrossFit) participants. CrossFit is one of the fastest growing fitness movements in the United States, it is important to understand how goals of the members and their perceptions of the motivational climate within the box may change over time or may be associated with gender. Results from this study may help practitioners determine if a CrossFit-type program might be appropriate for their athletes' training regimen, and, if so, the best strategies for implementation of such a program. Participants in this study were more likely to perceive a mastery-based motivational climate at CrossFit, indicating that focusing on improvements and gaining mastery over new skills is an important focal point for these individuals. Increased time in a program such as CrossFit may decrease this focus on mastery objectives as members become more familiar with basic movements/skills and begin to focus on how the climate in the CrossFit box encourages competition with other members (e.g., leader boards, etc.). Thus, creating a motivational climate in an exercise setting in which individuals' performances are monitored and recorded for the purpose of comparisons with others, or the development of larger scale fitness competitions may result in similar outcomes from a motivational standpoint. Understanding the impact of

these types of approaches is important because many conditioning programs may use these strategies with their clients/athletes.

Differences in goal structures across gender found in this study suggest that male and female CrossFit participants may view their goals differently and therefore, practitioners should be aware of what goals their clients have and the best way to encourage those individuals appropriately based on these types of variables. Encouraging mastery of skills can be beneficial for more self-referent individuals; however, some members will benefit from settings goals and standards that are based on others' performances and should be encouraged appropriately.

The inclusivity that CrossFit encourages may also be important in opening this form of physical activity to a large range of people outside of traditional sport and exercise settings. Therefore, it is important to understand the way that participants perceive the motivational climate and achievement goals. Recognizing the influence of such demographic factors such as gender and length of time in a program can also help practitioners to recognize and modify their behaviors to most effectively create optimal motivational environments for their clientele.

### NOTES

- The WODs for the 2 CrossFit facilities used in this research varied from one another but were consistent with the CrossFit standard of incorporating movements that incorporate strength, endurance, metabolic conditioning, and power. These CrossFit facilities used standardized Hero workouts (these WODs are standardized by CrossFit Headquarters and are named after various military or civil service heroes such as the Hotshots 19 named after the firefighters who lost their lives fighting a wildfire in Arizona in 2013), WODs posted by CrossFit Headquarters, as well as, WODs developed by the owners/head trainers. Because of the fact that participants in this varied in the amount of time they had been a part of these CrossFit facilities, it is not practical to provide the reader with all the WODs that the participants engaged in during their time with CrossFit. Additionally, the exact WODs the participants engaged in on the day that they filled out their questionnaires should have little to no impact on the participants' perceptions of motivational climate and their own goal achievement orientation. Furthermore, because of the reasons of confidentiality, the authors are unable to provide the names or Web sites for the two CrossFit facilities that were used in this study.
- The content of this article is not meant as an endorsement of CrossFit, nor do the authors suggest that strength and conditioning professionals should incorporate CrossFit training methods into their programs. However, as documented in the article, CrossFit is

one of the fastest growing fitness movements, and as such it is important for scholars to examine this training regimen from multiple theoretical perspectives so that strength and conditioning professionals can make educated decisions. Although this research does not encourage people to take up CrossFit, it does explore the perceptions of motivational climate and achievement goal orientations of people who were already actively engaged in a CrossFit training program.

**ACKNOWLEDGMENTS**

The authors acknowledge the Crossfit owners and members for their collaboration in this study. There was no conflict of interest for the authors in conducting this research. This research was not funded by any source. The results of this study do not constitute endorsement of the product by the authors or the National Strength and Conditioning Association.

**REFERENCES**

1. Ames, C. Achievement goals, motivational climate, and motivational processes. In: *Motivation in Sport and Exercise*. GC Roberts, ed. Champaign, IL: Human Kinetics, 1992. pp. 161–176.
2. Ames, C and Archer, J. Achievement goals in the classroom: Students' learning strategies and motivation process. *J Educ Psychol* 80: 260–267, 1988.
3. Bergeron, M, Nindl, BC, Deuster, PA, Baumgartner, N, Kane, SF, Kraemer, WJ, Sexauer, LR, Thompson, WR, and O'Connor, FG. Consortium for health and military performance and American College of Sports Medicine Consensus paper on extreme conditioning programs in military personnel. *Curr Sports Med Rep* 10: 383–389, 2011.
4. Biddle, SJH, Wang, CKJ, Kavussanu, M, and Spray, CM. Correlates of achievement goals orientations in physical activity: A systematic review of research. *Eur J Sport Sci* 3: 1–20, 2003.
5. Cetinkalp, ZK. Achievement goals and physical self-perceptions of adolescent athletes. *Soc Behav Personal* 40: 473–480, 2012.
6. Choi, PYL. Muscle matters: Maintaining visible differences between men and women. *Sex Evolut Gend* 5: 71–81, 2003.
7. Christodoulidis, T, Papaioannou, A, and Digelidis, N. Motivational climate and attitudes toward exercise in Greek senior high school: A year-long intervention. *Eur J Sport Sci* 1: 1–12, 2001.
8. Conroy, DE, Elliot, AJ, and Hofer, SM. A 2 X 2 achievement goals questionnaire for sport: Evidence for factorial invariance, temporal stability, and external validity. *J Sport Exerc Psych* 25: 456–476, 2003.
9. Conroy, DE, Kaye, MP, and Coatsworth, JD. Coaching climates and the destructive effects of mastery-avoidance achievement goals on situational motivation. *J Sport Exerc Psychol* 28: 69–92, 2006.
10. Cury, F, Elliot, AJ, Da Fonseca, D, and Moller, AC. The social-cognitive model of achievement motivation and the 2 x 2 achievement goal framework. *J Pers Soc Psychol* 90: 666–679, 2006.
11. Duda, JL. Motivation in sport: The relevance of competence and achievement goals. In: *Handbook of Competence and Motivation*. AJ Elliot and CS Dweck, eds. New York, NY: Guilford Press, 2005. pp. 318–335.
12. Dworkin, SL. A woman's place is in the...cardiovascular room? Gender relations, the body, and the gym. In: *Athletic Intruders: Ethnographic Research on Women, Culture and Exercise*. A Bolin and J Granskog, eds. Albany, NY: State University of New York Press, 2003. pp. 131–158.
13. Edmunds, JK, Ntoumanis, N, and Duda, JL. A test of self-determination theory in the exercise domain. *J Appl Soc Psychol* 36: 2240–2265, 2006.

14. Elliot, AJ. Approach and avoidance motivation and achievement goals. *Educ Psychol* 24: 149–169, 1999.
15. Elliot, AJ and McGregor, HA. A 2 X 2 achievement goal framework. *J Pers Soc Psychol* 80: 501–519, 2001.
16. Farrar, RE, Mayhew, JL, and Koch, AJ. Oxygen cost of kettlebell swings. *J Strength Cond Res* 24: 1034–1036, 2010.
17. Hanrahan, SJ and Cerin, E. Gender, level of participation, and type of sport: Differences in achievement goal orientation and attributional style. *J Sci Med Sport* 12: 508–512, 2009.
18. Harwood, CG. Assessing achievement goals in sport: Caveats for consultants and a case for contextualization. *J Appl Sport Psychol* 14: 106–114, 2002.
19. Harwood, C and Swain, AJ. The development and activation of achievement goals within tennis: II. A player, parent, and coach intervention. *Sport Psychol* 16: 111–137, 2002.
20. Johnston, L. Flexing femininity: Female body-builders refiguring "the body". *Gend Place Cult* 3: 327–340, 1996.
21. Jowett, S. When the "honeymoon" is over: A case study of a coach-athlete dyad in crisis. *Sport Psychol* 17: 444–460, 2003.
22. Kavussanu, M and Ntoumanis, N. Participation in sport and moral functioning: Does ego orientation mediate their relationship? *J Sport Exerc Psychol* 25: 501–518, 2003.
23. Kim, MS, Duda, JL, and Gano-Overway, L. Predicting occurrence of and responses to psychological difficulties: The interplay between achievement goals, perceived ability, and motivational climate among Korean athletes. *Int J Sport Exerc Psychol* 9: 31–47, 2011.
24. Knapp, BA. Rx'd and shirtless: An examination of gender in a CrossFit box. Unpublished manuscript, 2013.
25. Lirgg, CD, George, TR, Chase, MA, and Ferguson, RH. Impact of conception of ability and sex-type of task on male and female self-efficacy. *J Sport Exerc Psychol* 18: 426–434, 1996.
26. Mishkind, ME, Rodin, J, Silberstein, LR, and Striegel-Moore, RH. The embodiment of masculinity: Cultural, psychological, and behavioral dimensions. In: *The American Body in Context: An Anthology*. JR Johnston, ed. Wilmington, DE: Scholarly Resources Inc., 2001. pp. 103–120.
27. Moreno, JA, Cervelló, E, and González-Cutre, D. Relationships among goal orientations, motivational climate, and flow in adolescent athletes: Differences by gender. *Span J Psychol* 11: 181–191, 2008.
28. Newton, M, Duda, JL, and Yin, Z. Examination of the psychometric properties of the perceived motivational climate in sport questionnaire-2 in a sample of female athletes. *J Sports Sci* 18: 275–290, 2000.
29. Nicholls, JG. *The Competitive Ethos and Democratic Education*. Cambridge, MA: Harvard University Press, 1989.
30. Pajares, F, Britner, SL, and Valiante, G. Relation between achievement goals and self-beliefs of middle school students in writing and science. *Contemp Educ Psychol* 25: 406–422, 2000.
31. Rische, P. Froning and Thorisdottir repeat CrossFit titles as Games growth continues while eyeing greater media distribution. 2012. Available at: <http://www.forbes.com/sites/prishe/2012/07/20/froning-thorisdottir-repeat-crossfit-titles-as-games-growth-continues-while-eyeing-greater-media-distribution/>. Accessed October 11, 2012.
32. Roberts, GC. Understanding the dynamics of motivation in physical activity: The influence of achievement goals and motivational processes. In: *Advances in Motivation in Sport and Exercise*. GC Roberts, ed. Champaign, IL: Human Kinetics, 2001. pp. 1–50.
33. Salvatore, J and Marecek, J. Gender in the gym: Evaluation concerns as barriers to women's weight lifting. *Sex Roles* 63: 556–567, 2010. doi: 10.1007/s11199-010-900-8.
34. Seifriz, J, Duda, JL, and Chi, L. The relationship of perceived motivational climate to achievement-related affect and cognitions in basketball. *J Sport Exerc Psychol* 14: 375–391, 1992.

35. Smith, MM, Sommer, AJ, Starkoff, BE, and Devor, ST. Crossfit-based high intensity power training improves maximal aerobic fitness and body composition. *J Strength Cond Res* Epub ahead of print. doi: 10.1519/JSC.obo13e318289e59f.
36. Spray, CM and Wang, CKJ. Goal orientations, self-determination, and pupils' discipline in physical education. *J Sports Sci* 19: 903–913, 2001.
37. Stoeber, J and Crombie, R. Achievement goals and championship performance: Predicting absolute performance and qualification success. *Psychol Sport Exerc* 11: 513–521, 2010.
38. Stone, J and McWhinnie, C. Evidence that blatant versus subtle stereotype threat cues impact performance through dual processes. *J Exp Soc Psychol* 44: 273–280, 2008.
39. Tabachnick, BG and Fidell, LS. *Using Multivariate Statistics* (3rd ed.). New York, NY: Harper Collins, 1996.
40. van de Pol, PKC and Kavussanu, M. Achievement goals and motivational responses in tennis: Does context matter? *Psychol Sport Exerc* 12: 176–183, 2011.
41. What is CrossFit? (2012). Available at: <http://community.crossfit.com/what-is-crossfit>. Accessed October 11, 2012.
42. White, SA and Zellner, SR. The relationship between goal orientation, beliefs about the causes of sport success, and trait anxiety among high school, intercollegiate, and recreational sport participants. *Sport Psychol* 10: 58–72, 1996.