

Intersectionality matters: Gender, race/ethnicity, and sport level differentiate perceived coach-created motivational climates and psychological needs

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Abstract:

This study examined the intersection of athletes' gender, race/ethnicity, and sport level related to their perceptions of coach-created climates and psychological needs in sports. Participants, including 406 high school athletes ($M_{\text{age}} = 15.47$; 42.3% female) and 440 collegiate athletes ($M_{\text{age}} = 19.73$; 53.9% female) in the United States, completed validated measures of coach-created motivational climates and psychological need satisfaction/frustration. To examine intersectionality, we conducted 2 (male, female) \times 3 (Black, Hispanic/Latinx, White) \times 2 (high school, college) multivariate analyses of variance and follow-up descriptive discriminant analyses on (a) coach-created climates (task involving, autonomy supportive, relatedness supportive, ego involving, and controlling) and (b) psychological needs (satisfaction/frustration of autonomy, competence, and relatedness). Three significant interactions emerged: (a) gender by race on coach-created climates, primarily ego involving ($r_s = -.60$) and controlling ($r_s = -.92$); (b) gender by sport level on coach-created climates, primarily task involving ($r_s = -.50$), ego involving ($r_s = -.46$), and controlling ($r_s = -.42$); and (c) gender by race on psychological needs, primarily competence satisfaction ($r_s = .56$), autonomy frustration ($r_s = -.36$), competence frustration ($r_s = -.60$), and relatedness frustration ($r_s = -.68$). The most consistent results were more perceived disempowering coach-created climates and psychological need frustration in Black male athletes than other gender by race subgroups, but the most positive perceptions in Black female athletes. Additional exploratory analyses indicated that significantly different correlations between coach-created climates and psychological needs were primarily stronger relationships for high school female than high school male athletes. In practice, coaches should consider athletes' intersecting identities and mitigate their gendered and racialized experiences.

Keywords: athletes' gender | race/ethnicity | racism | Black masculinity | Hispanic | self-determination theory | coach-created climates | psychological needs | high school athletes | collegiate athletes

Article:

Self-determination theory (SDT; Deci & Ryan, 2000) has been frequently used to explore athletes' motivational processes, including perceptions of motivational factors such as the sport environment created by others and basic psychological needs (Chu & Zhang, 2019; Keegan et

al., 2014). Basic psychological needs theory (Deci & Ryan, 2000), a mini-theory within SDT, explains that, like physiological needs, individuals need to have three psychological needs (autonomy, competence, and relatedness) satisfied to optimize motivation and functioning in a social context (e.g., sport). Autonomy is defined as the need to perceive a level of volition, competence as the need to feel effective, and relatedness as the need to feel connected in an environment (Deci & Ryan, 2000). Research has shown that athletes' need satisfaction is positively related to various desirable outcomes, such as intrinsic motivation and well-being (Adie et al., 2008). Meanwhile, athletes' psychological needs may be frustrated by their sport environments; such need frustration is likely to be associated with maladaptive outcomes, such as distress, negative emotions, and burnout (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011). Therefore, exploring differences in perceptions of need satisfaction and frustration between athletes from different backgrounds, and factors contributing to these differences, would be helpful for supporting diverse athletes' motivation and, in turn, performance and well-being. In their review of social agents who influence need satisfaction and frustration in sport, Chu and Zhang (2019) found that coaches, compared with parents and peers, have the largest influence and create social environments that have both positive and negative influences on youth and young adult athletes. For instance, positive influences could come from social environments that offer opportunities for athletes to make strategic decisions, receive positive and constructive feedback, and develop trusting relationships; negative influences come from those that limit such opportunities. Coaches' expectations about their athletes' abilities associated with their identities (e.g., gender, race/ethnicity) can influence how coaches provide or withhold these opportunities in sport environments (Solomon et al., 1996). Thus, we assessed how athletes with different identities perceive these environments through coach-created motivational climates. Integrating SDT and achievement goal theory (Ames, 1992), Duda (2013) categorized multidimensional coach-created motivational climates as empowering or disempowering based on coaches' behaviors and creation of the practice and competition environments. An empowering coach-created motivational climate is task involving (e.g., encouraging effort and task mastery as successes), autonomy supportive (e.g., providing rationales and supporting athlete choices), and socially supportive (e.g., promoting cooperation and providing unconditional regard). In contrast, a disempowering coach-created motivational climate is ego involving (e.g., focusing on outcomes and peer comparison as successes) and controlling (e.g., belittling athletes or devaluing their perspectives; Duda, 2013). Athletes' perceptions of the empowering climate dimensions are positively related to need satisfaction and desirable outcomes (e.g., enjoyment) and negatively related to need frustration and undesirable outcomes (e.g., burnout); their perceptions of the disempowering climate dimensions showed the opposite patterns (e.g., Appleton & Duda, 2016; Chu et al., 2021). Despite considerable research on the critical role of social environments, few studies have examined potential differences in athletes' perceptions of motivational climates based on gender, race/ethnicity, or sport level (e.g., Weiss, 2015), and none to our best knowledge have examined such differences based on the intersections of these identities (see Chu & Zhang, 2019; Keegan et al., 2014).

Gender, Race/Ethnicity, and Sport Level

Social identities can influence how people perceive and experience their environments. Based on real-life examples and recent findings in sport (Cooper, Davis, & Dougherty, 2017; Simien et al., 2019), it is plausible that athletes with certain racial/ethnic and gender identities (e.g., Black male/female) are more likely to experience their sport environments negatively and their needs as being frustrated. For example, Mikayla Hayes, a Black female basketball athlete from the

University of Florida, shared how she and her Black teammates received sexist and racist comments from their coach (Barr, 2021). In addition, Hispanic/Latinx high school athletes in Northern California faced racialized events that involved opposing fans and players, including being called racial/ethnic slurs and having tortillas thrown at them (Sabedra, 2022). Regarding the level of competition, collegiate athletes (vs. high school) might perceive their sport environments as being more controlling and their needs as being more frustrated given their scholarship rewards and intense schedules (Kingston et al., 2006; Moller & Sheldon, 2020). Additionally, when considered in conjunction with race/ethnicity, collegiate athletes of color may perceive their environments as even more controlling and limiting than their White counterparts. Thus, research must consider the intersection of athletes' identities along with sport level.

Although there is a lack of empirical evidence on the intersections of gender and race/ethnicity in sport motivation research, these demographic variables have been investigated independently (Simien et al., 2019). In terms of athletes' gender, male and female athletes appear to perceive and be influenced by motivational factors differently (see Clancy et al., 2016). Through semistructured interviews with youth sport coaches about their coaching styles, Carroll and Allen (2021) found that coaches vary their behaviors according to the gender of their athletes, such as providing more autonomy support to female than male athletes. Similarly, high school and collegiate female athletes reported greater autonomy, relatedness, and self-determined motivation than their male counterparts (Amorose & Anderson-Butcher, 2007). However, Adie et al. (2008) revealed that male and female athletes did not perceive need satisfaction differently. Beyond athletes' gender, their race/ethnicity is related to how they perceive their sport environments and how they are treated. Athletes of color face racialized environments and behaviors from coaches and teammates, such as stereotyping, racial stacking, microaggressions, and discouragement in the expression of their racial/ethnic identity (Cooper et al., 2013; Simien et al., 2019). For example, Black athletes experience racial stacking when they are put into specific positions with supposed intellectual inferiority (e.g., only playing second base or outfield instead of shortstop or catcher in baseball) and microaggressions that attribute their physical abilities to their race/ethnicity (Cooper et al., 2013; Lee et al., 2018). Hispanic/Latinx athletes are subjected to racist remarks and stereotyping from teammates and coaches, particularly around the perceptions that they are foreigners or illegal immigrants (Manwell et al., 2021; Ortega, 2021). Considering these findings through the lens of SDT, Black and Hispanic/Latinx athletes might perceive their sport environments as controlling, lacking in support, and frustrating their psychological needs. In fact, Ramos et al. (2018) found that non-White collegiate club swimmers perceived lower levels of competence and social motivational factors than their White counterparts. However, Ramos et al. (2018) did not examine specific racial/ethnic differences, which require further exploration.

In addition to gender and race/ethnicity, sport level (e.g., high school vs. college) also may be related to how athletes appraise and are influenced by their sport environments. In their examination of coach-created motivational climates, psychological needs, and motivation in high school and collegiate athletes, Amorose and Anderson-Butcher (2007) found that high school athletes perceived significantly greater autonomy supportive coach-created climates, but less competence satisfaction, than collegiate athletes. They also examined the gender by sport level interaction but found no significant effect. In another study, high school athletes perceived significantly greater task involving coach-created climates, but less competence and social support, than collegiate athletes (Weiss, 2015). In other words, high school athletes may perceive their coach-created environments as being more empowering, but their psychological needs as being less fulfilled, than collegiate athletes. More nuanced considerations of these differences,

such as how sport level might intersect with gender and race/ethnicity, have not been and should be studied.

The Present Study: Intersectional Focus

Although methodologically sound and informative in their findings, the sport motivation literature has been limited by not considering intersecting identities. The concept of intersectionality was introduced by Crenshaw (1989), suggesting that salient social identities, such as gender, race/ethnicity, class, and sexuality, cannot be explored in isolation, but rather must be considered as interrelated factors. Previous research has utilized this framework to develop a more nuanced understanding of how social identities, especially marginalized ones, can interact to uniquely shape individuals' experiences, perceptions, and well-being across a variety of settings and populations (Collins, 2015; Lim et al., 2021). As illustrated through the aforementioned real-life examples, the intersections of athletes' marginalized identities can predispose them to unequal treatment from others that, in turn, can affect their sport experiences (Cooper, Davis, & Dougherty, 2017; Ortega, 2021). To examine the influence of intersectionality in sport and physical activity, Lim et al. (2021) reviewed 45 studies and concluded that female athletes of all races/ethnicities and male athletes of color experience unique forms of discrimination and differential treatment from a variety of sources, such as belittling stereotypes from the media and their peers. Further, they suggested that female athletes of color experience more discrimination compared with White female athletes or male athletes of color due to the intersection of gender and race/ethnicity, that is, holding two marginalized identities. Thus, athletes with intersecting marginalized identities (e.g., female athletes of color) might perceive their sport environments more negatively and be more frustrated in their psychological needs than athletes holding dominant identities.

Given these initial findings that highlighted the importance of considering intersectionality in sport (see Lim et al., 2021), we examined the intersection of gender (male, female), race/ethnicity (Black, Hispanic/Latinx, White), and sport level (high school, collegiate) in relation to athletes' perceptions of coach-created motivational climates and psychological need satisfaction and frustration. In doing so, we aimed to identify which dimensions of coach-created climates and psychological needs contributed to group differences. Due to the preliminary nature of this topic, we did not form any specific hypotheses.

Method

Transparency and openness

All data, procedures, ethical codes, and other methods developed by the authors are appropriately cited in the text and listed in the reference section. The data sets generated and analyzed in the present study are available upon reasonable request. None of the study materials have been preregistered.

Participants

Although our samples were initially large (505 high school athletes and 523 collegiate athletes), outside of Black, White, and Hispanic/Latinx, we did not have enough representation and statistical power to study other racial/ethnic identities. Thus, we removed 70 (nine American Indian/Alaska Native, 19 Asian, one Native Hawaiian/Pacific Islander, and 41 mixed race) and

68 (three American Indian/Alaska Native, 19 Asian, four Native Hawaiian/Pacific Islander, and 42 mixed race), respectively, from the high school and college samples. In addition, we removed participants with more than 50% missing values (eight from high school; none from college), univariate outliers (13 from high school; eight from college), and multivariate outliers (eight from high school; five from college). After the removal of these cases, the final sample for data analyses was 846 participants.

The final high school sample consisted of 406 athletes ($M_{\text{age}} = 15.47 \pm 1.18$ years) who were drawn from two suburban high schools in the Southwestern United States. The final college sample consisted of 440 athletes ($M_{\text{age}} = 19.73 \pm 1.37$ years) from three National Collegiate Athletic Association Division I institutions in the Southwestern United States and two National Collegiate Athletic Association Division II institutions in the Southwestern and Southeastern United States. The gender composition in the high school/college samples was 42.3%/53.9% female and 57.7%/46.1% male; the race/ethnicity composition in the high school/college samples was 45.7%/58.0% White, 36.7%/8.6% Hispanic/Latinx, and 17.6%/33.4% Black (see Supplemental Table S1). Athletes from both samples participated in sports including baseball, basketball, cross country/track and field, football, soccer, tennis, volleyball, and softball, whereas the college sample also included equestrian, gymnastics, golf, rowing, and swimming.

The athletes were part of two larger, grant-funded studies on social environments and motivation in sport. Yet, data for this study have not been reported elsewhere. Due to the data having been collected as part of two larger studies, we performed a recommended retrospective design analysis using an R function, *retrodesign()*, to calculate the (a) power, (b) Type S error—the probability that the replicated estimate carries a wrong sign, and (c) Type M error (i.e., exaggeration ratio)—the expectation of the absolute value of the estimate divided by the effect size (see Altoè et al., 2020; Gelman & Carlin, 2014, for detailed discussions on design analysis). Based on the final sample size of this study, a significance level of $\alpha = .05$, and an effect size of $d = 0.20$, the retrospective design analysis indicated power = .90, Type S error = 0, Type M = 1.07 (i.e., 7%), indicating that our sample size was adequate for producing replicable significant results (i.e., group differences) with correct directions and minimal overestimates of the population differences (Gelman & Carlin, 2014).

Procedure and Measures

Upon approval from the university's institutional review board, we contacted athletic administrators and coaches via email to seek permission for their athletes' participation in the study. Following receipt of permission from two high schools and five universities, we obtained informed parental consent and child assent from the high school athletes and informed consent from the collegiate athletes. To mitigate social desirability and subsequent common-method bias, we collected data in person at each corresponding site by explaining the study (e.g., no right or wrong answers as long as they are truthful) to the consented athletes and distributing pencil-and-paper surveys for them to complete in the absence of coaches and athletics staff (Podsakoff et al., 2012). Each data collection session took 20–25 min. Upon survey completion, which included demographic and sport participation information as well as the measures (with a balance of positively and negatively worded items) described below, each athlete received a cash payment or small gift for their participation.

Coach-Created Motivational Climates

We assessed coach-created motivational climates using the 34-item Empowering and Disempowering Motivational Climate Questionnaire (Appleton et al., 2016). Participants responded to each item on a Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The motivational climate dimensions included (a) task involving (nine items; e.g., “My coach encourages athletes to try new skills”), (b) autonomy supportive (five items; e.g., “My coach gives athletes choices and options”), and (c) relatedness supportive (three items; e.g., “My coach really appreciates athletes as people, not just as athletes”) climates, which are empowering; (d) ego involving (seven items; e.g., “My coach gives most attention to the best athletes”), and (e) controlling coaching (10 items; e.g., “My coach yells at athletes for messing up”) climates, which are disempowering. The scores of the measure showed good validities and reliabilities in youth and young adult athletes across various sports and countries in past studies (Appleton et al., 2016; Chu et al., 2021; Martínez-González et al., 2021) and this study (see Table 1).

Psychological Need Satisfaction and Frustration

We measured satisfaction of psychological needs using a six-item autonomy scale (e.g., “I help decide what I do when participating in my sport”; Hollembeak & Amorose, 2005), the five-item Perceived Competence subscale of the Intrinsic Motivation Inventory (e.g., “I think I am pretty good at my sport”; McAuley et al., 1989), and the five-item Need for Relatedness Scale (e.g., “In my team, I feel supported”; Richer & Vallerand, 1998). We assessed frustration of psychological needs using the 12-item Psychological Need Thwarting Scale (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011), which includes three subscales (four items each): autonomy (e.g., “I feel pushed to behave in certain ways”), competence (e.g., “Situations occur in which I am made to feel incapable”), and relatedness (e.g., “I feel other people dislike me”) subscales. Across all the psychological need satisfaction and frustration items, participants responded on a Likert scale from 1 = strongly disagree to 7 = strongly agree. The scores of these measures demonstrated good validities and reliabilities for assessing youth and young adult athletes across sports and countries in past studies (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Chu et al., 2021) and this study (see Table 1).

Data Analysis

We first screened the data set for missing and invalid values, outliers, and normality, removing cases with invalid responses or more than 50% of missing values. Then, we detected univariate normality based on $|\text{skewness}|$ and $|\text{kurtosis}| < 2$ and univariate outliers using $|z| > 3$ (George & Mallery, 2010; Tabachnick & Fidell, 2013). We further assessed multivariate outliers and normality using the MULTINOR graphical method, which plotted chi-square values against the Mahalanobis distance (D^2) of the predictors (Thompson, 1990). After data inspection and handling of missing data, we computed the means of each subscale, followed by Cronbach’s alpha, and descriptive statistics as preliminary analyses.

Table 1. Group Means and Standard Deviations for Coach-Created Motivational Climates and Psychological Need Satisfaction and Frustration

Gender		Race/ethnicity			Level	
Male (n = 437)	Female (n = 409)	Black (n = 220)	Hispanic/ Latinx (n = 188)	White (n = 438)	High school (n = 406)	College (n = 440)

Variable	α	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>
Coach-created motivational climates (range = 1-5)								
Task involving	.83	4.03(0.59)	4.14 (0.58)	4.08 (0.59)	4.09 (0.59)	4.08 (0.58)	4.04 (0.59)	4.12 (0.58)
Autonomy support	.73	3.79 (0.62)	3.75 (0.71)	3.78 (0.64)	3.77 (0.63)	3.77 (0.69)	3.75 (0.59)	3.79 (0.73)
Relatedness support	.79	3.82 (0.78)	3.68 (0.99)	3.73 (0.82)	3.90 (0.84)	3.70 (0.94)	3.86 (0.81)	3.66 (0.95)
Ego involving	.84	3.21 (0.78)	3.15 (0.93)	3.21 (0.83)	2.99 (0.82)	3.24 (0.87)	3.07 (0.85)	3.28 (0.84)
Controlling	.80	3.00 (0.63)	2.87 (0.73)	3.00 (0.68)	2.85 (0.68)	2.95 (0.69)	2.88 (0.66)	2.99 (0.70)
Psychological needs (range = 1-7)								
Autonomy satisfaction	.74	4.35 (0.98)	4.27 (1.10)	4.23 (0.99)	4.45 (0.91)	4.29 (1.11)	4.41 (1.01)	4.22 (1.06)
Competence satisfaction	.75	5.22 (0.94)	5.19 (0.98)	5.12 (1.02)	5.09 (0.98)	5.30 (0.91)	5.17 (1.00)	5.24 (0.92)
Relatedness satisfaction	.90	5.23 (1.09)	5.16 (1.32)	5.23 (1.20)	4.99 (1.21)	5.26 (1.20)	4.92 (1.20)	5.45 (1.16)
Autonomy frustration	.84	3.99 (1.33)	3.97 (1.45)	3.94 (1.43)	3.63 (1.39)	4.15 (1.33)	3.72 (1.33)	4.22 (1.39)
Competence frustration	.87	3.27 (1.35)	3.40 (1.54)	3.28 (1.46)	3.25 (1.34)	3.39 (1.49)	3.30 (1.32)	3.36 (1.56)
Relatedness frustration	.81	3.04 (1.37)	2.86 (1.34)	2.96 (1.44)	2.94 (1.31)	2.95 (1.33)	3.16 (1.27)	2.77 (1.40)

For the main analyses, we conducted two independent 2 (male, female) \times 3 (Black, Hispanic/Latinx, White) \times 2 (high school, college) multivariate analyses of variance (MANOVAs). In the first, we used coach-created motivational climates (i.e., task involving, autonomy supportive, relatedness supportive, ego involving, and controlling) as the dependent variables, and in the second, psychological need satisfaction and frustration (i.e., autonomy satisfaction, competence satisfaction, relatedness satisfaction, autonomy frustration, competence frustration, and relatedness frustration). To delineate the multivariate effects, we conducted a follow-up descriptive discriminant analysis (DDA) after each MANOVA. DDA creates a composite variable from the observed dependent variables that accounts for the largest differences in the independent variable (i.e., groups). The unique strengths of DDA include answering research questions that address multivariate effects and reducing the Type I errors caused by conducting univariate post hoc tests (see Barton et al., 2016; Enders, 2003, for detailed discussions).

Based on Enders's (2003) guidelines, we investigated the statistical significance ($p < .05$) and squared canonical correlation ($R_c^2 > .02$) to determine whether the function was worth interpreting. If so, we then examined structure coefficients ($r_s > .30$) along with standardized discriminant coefficients to determine which dependent variables were contributing to the significant group differences. Next, we conducted follow-up univariate analyses on the corresponding interaction composites and group centroids—group means based on the composite dependent variable (i.e., discriminant function scores)—from the significant interaction effects. We then determined the specific group differences that were significant based on nonoverlapping 95% confidence intervals (CI) between two interaction composites or group centroids.

Due to our focus on intersectional analyses, we performed follow-up univariate analyses on the group centroids from the significant main effects only if the corresponding interaction effects were not significant (Enders, 2003). The Bonferroni-adjusted significance levels of $\alpha = .025$ ($.05/2$) and $\alpha = .016$ ($.05/3$) were used for the composite comparisons of gender or level and race/ethnicity, respectively. Partial eta-squared (η_p^2) values of .01, .06, and .14, and Cohen's d values of 0.20, 0.50, and 0.80, indicated small, medium, and large effect sizes, respectively (Cohen, 1988).

Results

Missing data analyses revealed only 0.77% of all data points across cases and survey items were missing. Due to the relatively large sample size and small proportion of missing values, we imputed the data using mean substitution (Parent, 2013). Additionally, we conducted a series of t -tests examining whether significant differences existed between participants with and without missing data, and none of them were significant ($p > .05$). The final data set achieved both univariate and multivariate normality. Table 1 displays the means and standard deviations for each coach-created climate and psychological need satisfaction and frustration variable by gender, race/ethnicity, and level. The general trends of the means indicated that positive factors (e.g., autonomy satisfaction) were higher than the midpoint of the scales, and negative factors (e.g., autonomy or competence frustration) were at or below the midpoint of the scales.

Coach-Created Motivational Climates

The MANOVA on coach-created motivational climates resulted in a significant ($p < .001$) Box's M test, which violates the assumption of homogeneity of variances and covariances across groups. Thus, we used Pillai's Trace instead of Wilks' Lambda to evaluate the statistical significance of the results (Tabachnick & Fidell, 2013). Significant interaction effects were found between gender and race, Pillai's Trace = .029, $F(10, 1662) = 2.40$, $p = .008$, $\eta_p^2 = .014$, and gender and level, Pillai's Trace = .016, $F(5, 830) = 2.75$, $p = .018$, $\eta_p^2 = .016$; but not between race and level, Pillai's Trace = .017, $F(10, 1662) = 1.42$, $p = .165$, $\eta_p^2 = .008$, or gender, race, and level, Pillai's Trace = .019, $F(10, 1662) = 1.59$, $p = .105$, $\eta_p^2 = .009$. The follow-up DDAs of the significant interaction effects revealed significant functions of gender by race and gender by level, accounting for 1.7% and 2.5% of the variance, respectively, in coach-created motivational climates.

Gender by Race Interactions

Examination of the standardized discriminant function coefficients and structure coefficients suggested that ego involving ($r_s = -.60$) and controlling ($r_s = -.92$) climates primarily contributed to the differences across gender by race (see Table 2). The group centroids indicated significantly more negative perceptions of coach-created motivational climates in (a) Black male than White male and female (of all races/ethnicities) athletes and (b) Black male and White male than Black female athletes, $F(2, 840) = 8.91$, $p < .001$, $\eta_p^2 = .021$ (see Table 3, Figure 1, and Supplemental Table S2).

Table 2. Squared Canonical Correlations, Standardized Discriminant Function Coefficients, and Structure Coefficients for Significant Effects on Coach-Created Motivational Climates and Psychological Needs

Variable	R_c^2	Standardized coefficient	r_s	r_s^2
Gender x Race	.017			
Task involving		.02	.18	.03
Autonomy support		.30	.23	.05
Relatedness support		-.56	.12	.01
Ego involving		.03 ^a	-.60 ^b	.36
Controlling		-1.09	-.92 ^b	.85
Gender x Level	.025			
Task involving		-.89	-.50 ^b	.25
Autonomy support		-.43	-.21	.04
Relatedness support		.82	.26	.07
Ego involving		-.40	-.46 ^b	.21
Controlling		-.17	-.42 ^b	.18
Gender x Race	.045			
Autonomy satisfaction		-.20	.15	.02
Competence satisfaction		.66	.56 ^b	.32
Relatedness satisfaction		-.60	.04	.00
Autonomy frustration		-.10	-.36 ^b	.13
Competence frustration		-.29	-.60 ^b	.36
Relatedness frustration		-.69	-.68 ^b	.47
Level	.187			
Autonomy satisfaction		-.18	-.14	.02
Competence satisfaction		-.09	.15	.02
Relatedness satisfaction		.70	.60 ^b	.36
Autonomy frustration		.79	.47 ^b	.22
Competence frustration		-.03	-.01	.00
Relatedness frustration		-.48	-.41 ^b	.17

Note. R_c^2 = squared canonical correction; r_s = structure coefficients; r_s^2 = squared structure coefficients. ^a Variables with high structure coefficients but low standardized discriminant coefficients due to shared variance with other predictors. ^b $|r_s| > .30$.

Table 3. Composite Group Centroids for Effects on Coach-created Motivational Climates and Psychological Needs

Variable	Group centroid	95% CI
Gender x Race on coach-created motivational climates		
Male		
Black	-0.384	[-0.555, -0.213]
Hispanic/Latinx	-0.007	[-0.214, 0.199]
White	-0.040	[-0.175, 0.094]
Female		
Black	0.401	[0.189, 0.613]
Hispanic/Latinx	0.077	[-0.124, 0.278]

White	0.080	[-0.051, 0.210]
Gender x Level on coach-created motivational climates		
Male		
High school	0.137	[0.008, 0.267]
College	0.067	[-0.071, 0.206]
Female		
High school	0.392	[0.242, 0.543]
College	-0.478	[-0.606, -0.349]
Gender x Race on psychological needs		
Male		
Black	-0.384	[-0.554, -0.214]
Hispanic/Latinx	0.077	[-0.129, 0.283]
White	0.084	[-0.050, 0.219]
Female		
Black	0.410	[0.200, 0.621]
Hispanic/Latinx	-0.012	[-0.211, 0.187]
White	-0.077	[-0.208, 0.054]
Level on psychological needs		
High school	-0.401	[-0.491, -0.311]
College	0.370	[0.270, 0.470]

Note. CI= confidence interval.

Gender by Level Interactions

Examination of the standardized discriminant function coefficients and structure coefficients suggested that task involving ($r_s = -.50$), ego involving ($r_s = -.46$), and controlling ($r_s = -.42$) climates primarily contributed to the differences across gender by level (see Table 2). The group centroids indicated significantly more negative perceptions of coach-created motivational climates in (a) collegiate female than collegiate male athletes and high school (male and female) athletes and (b) collegiate male than high school female athletes, $F(1, 842) = 32.83$, $p < .001$, $\eta_p^2 = .038$ (see Table 3, Figure 2, and Supplemental Table S3).

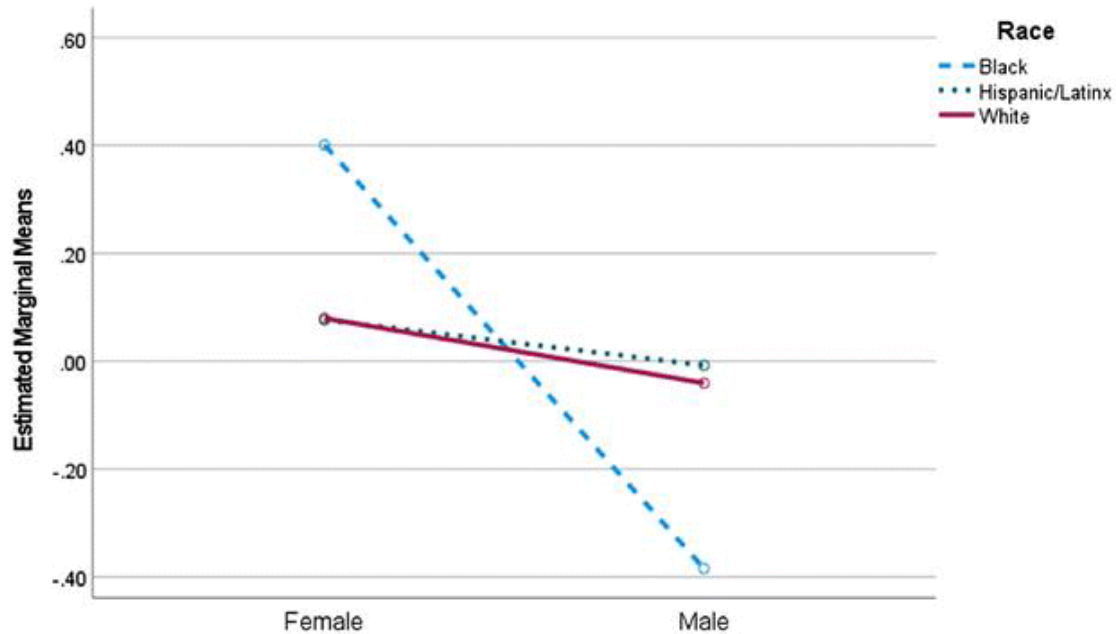


Figure 1. Note. See the online article for the color version of this figure.

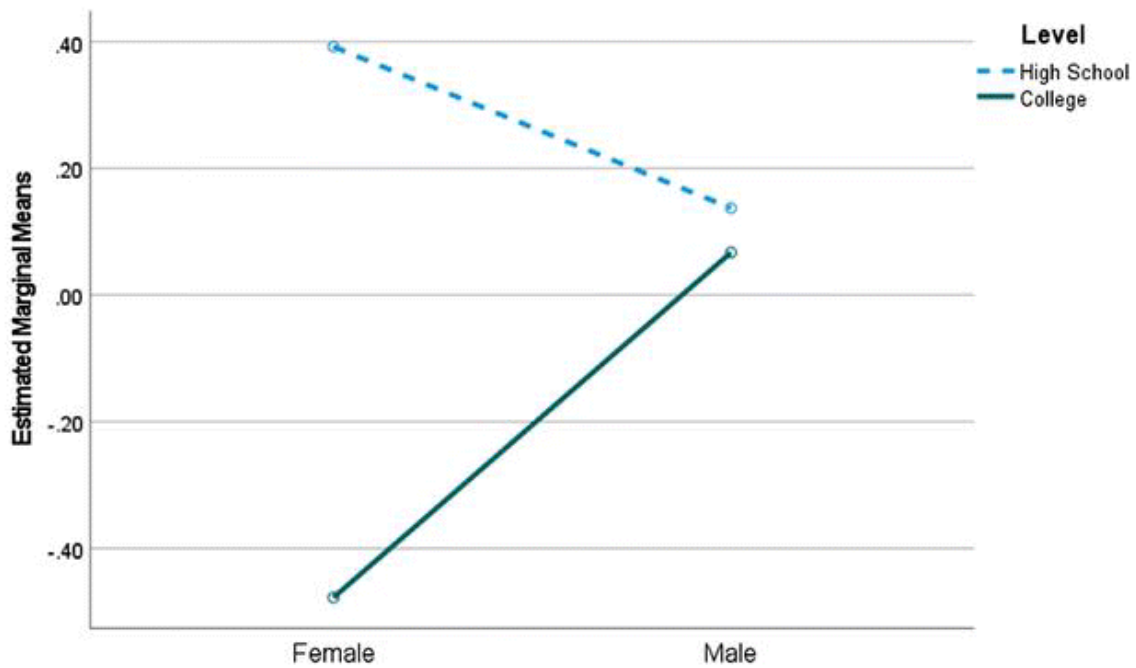


Figure 2. Note. See the online article for color version of this figure.

Psychological Need Satisfaction and Frustration

The MANOVA resulted in a significant ($p < .001$) Box's M test. As previously mentioned, we used Pillai's Trace instead of Wilks' Lambda to evaluate the statistical significance of the results. Significant interaction effects were found between gender and race, Pillai's Trace = .042, $F(12,$

1660) = 2.976, $p < .001$, $\eta_p^2 = .021$, and race and level, Pillai's Trace = .025, $F(12, 1660) = 1.771$, $p = .048$, $\eta_p^2 = .013$, but not gender and level, Pillai's Trace = .014, $F(6, 829) = 1.936$, $p = .072$, $\eta_p^2 = .014$, or gender, race, and level, Pillai's Trace = .021, $F(12, 1660) = 1.464$, $p = .131$, $\eta_p^2 = .010$. The follow-up DDAs of the significant interaction effects revealed significant functions of gender by race and race by level, accounting for 4.5% and 0.03% of the variance, respectively, in psychological need satisfaction and frustration. The race-by-level interaction effect was not further interpreted due to its low amount of variance explained (Barton et al., 2016; Enders, 2003). Instead, a significant main effect of level, Pillai's Trace = .110, $F(6, 829) = 17.071$, $p < .001$, $\eta_p^2 = .110$, but not race, Pillai's Trace = .020, $F(12, 1660) = 1.416$, $p = .151$, $\eta_p^2 = .010$, was found and interpreted. The follow-up DDA of the significant main effect revealed a significant function of level, accounting for 18.7% of the variance in psychological need satisfaction and frustration.

Gender by Race Interactions

Examination of the standardized discriminant function coefficients and structure coefficients suggested that competence satisfaction ($r_s = .56$), autonomy frustration ($r_s = -.36$), competence frustration ($r_s = -.60$), and relatedness frustration ($r_s = -.68$) primarily contributed to the differences across gender by race (see Table 2). The group centroids indicated significantly more psychological need frustration and less competence satisfaction in (a) Black male than White male, Hispanic/Latinx male, and female (of all races/ethnicities) athletes, and (b) Hispanic/Latinx female, White female, and White male than Black female athletes, $F(2, 840) = 17.24$, $p < .001$, $\eta_p^2 = .039$ (see Table 3, Figure 3, and Supplemental Table S2).

Sports Level Main Effects

Examination of the standardized discriminant function coefficients and structure coefficients suggested that relatedness satisfaction ($r_s = .60$), autonomy frustration ($r_s = .47$), and relatedness frustration ($r_s = -.41$) primarily contributed to the differences across sport level (see Table 2). The group centroids indicated significantly more relatedness satisfaction but also more autonomy frustration in collegiate than high school athletes, $t(844) = 11.11$, $p < .001$, $d = 0.77$ (see Table 3).

Exploratory, Follow-Up Correlation Comparisons

We conducted exploratory, follow-up comparisons of the correlations between coach-created climates and psychological need satisfaction/ frustration across the subgroups with significant interactions (i.e., gender by race and gender by level) from the MANOVAs above. Significant moderation of these relationships, shown by different magnitudes in correlations, could inform future research on this burgeoning area. To examine if the correlations were significantly moderated by the interaction of gender by race (six groups) and then gender by level (four groups), we followed Zou's (2007) approach using the raw data in the *cocor* package in R (Diedenhofen & Musch, 2015). This approach uses the 95% CI of the difference in two correlation coefficients, across independent groups in our case, to determine moderation. Compared with statistical tests, the construction of the CIs is less biased by accounting for skewness in the sampling distributions (Zou, 2007). This CI approach to examining significant differences in correlations is analogous to using the CI of mean differences.¹ That is, two

correlation coefficients are significantly different if the 95% CI of their correlation difference does not include 0.

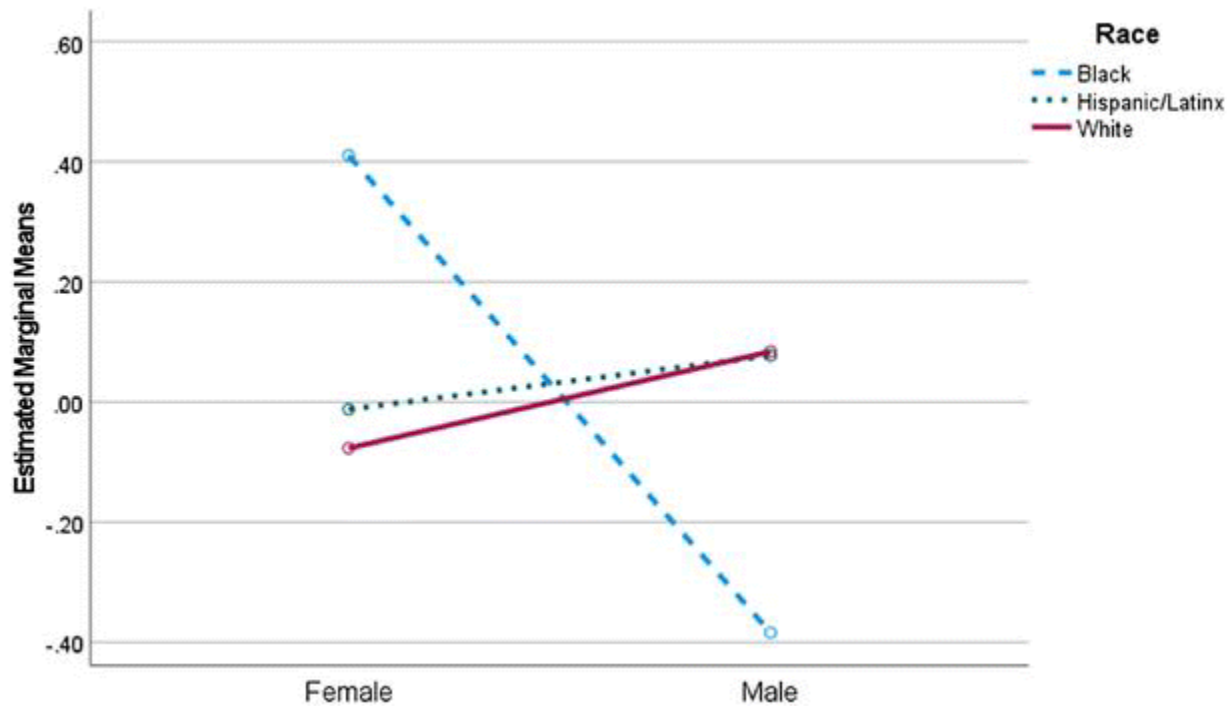


Figure 3. Note. See the online article for the color version of this figure

Gender by Race Subgroups

Comparisons of the correlations revealed seven significant differences across the six gender by race subgroups (see Supplemental Table S4). Three significant differences were between White female and White male athletes: (a) empowering climates with autonomy satisfaction ($r_{diff} = .19$, 95% CI [.045, .335]), (b) disempowering climates with autonomy satisfaction ($r_{diff} = -.20$, 95% CI [-.342, -.052]), and (c) disempowering climates with competence frustration ($r_{diff} = .19$, 95% CI [.056, .324]). Another significant difference was for empowering climates with competence frustration between Black female and Black male athletes ($r_{diff} = -.24$, 95% CI [-.453, -.017]). Two correlations significantly differed between Hispanic female and Hispanic male athletes: (a) disempowering climates with autonomy satisfaction ($r_{diff} = -.15$, 95% CI [-.489, -.022]) and (b) disempowering climates with competence frustration ($r_{diff} = .27$, 95% CI [.037, .493]). Within gender, there was only one significant difference in the correlations—a stronger association between disempowering climates and autonomy frustration for Hispanic female than Black female athletes ($r_{diff} = .22$, 95% CI [.020, .441]). Taken together, the associations between coach-created motivational climates and psychological need satisfaction/frustration were stronger for female than male athletes within each racial/ethnic group.

Gender by Level Subgroups

Correlation comparisons revealed multiple significant differences across the four gender by level subgroups (see Supplemental Table S5). Seven significant differences were between

high school female and high school male athletes: (a) empowering climates with autonomy frustration ($r_{\text{diff}} = -.23$, 95% CI $[-.400, -.057]$), (b) empowering climates with competence frustration ($r_{\text{diff}} = -.23$, 95% CI $[-.387, -.076]$), (c) empowering climates with relatedness frustration ($r_{\text{diff}} = -.18$, 95% CI $[-.349, -.008]$), (d) disempowering climates with autonomy satisfaction ($r_{\text{diff}} = .20$, 95% CI $[-.355, -.042]$), (e) disempowering climates with relatedness satisfaction ($r_{\text{diff}} = -.18$, 95% CI $[-.400, -.020]$), (f) disempowering climates with competence frustration ($r_{\text{diff}} = .22$, 95% CI $[.071, .371]$), and (g) disempowering climates with relatedness frustration ($r_{\text{diff}} = .25$, 95% CI $[.085, .401]$). One significant difference was for disempowering climates with relatedness frustration between collegiate female and collegiate male athletes ($r_{\text{diff}} = -.20$, 95% CI $[-.348, -.033]$). This difference was the only one that showed a stronger relationship between coach-created motivational climates and psychological need satisfaction/frustration for male than female athletes.

Within gender, three correlations significantly differed between high school and collegiate female athletes: (a) empowering climates with relatedness frustration ($r_{\text{diff}} = -.22$, 95% CI $[-.393, -.051]$), (b) disempowering climates with autonomy frustration ($r_{\text{diff}} = .16$, 95% CI $[.011, .271]$), and (c) disempowering climates with relatedness frustration ($r_{\text{diff}} = .27$, 95% CI $[.103, .417]$). Furthermore, two correlations significantly differed between collegiate and high school male athletes: (a) disempowering climates with competence frustration ($r_{\text{diff}} = .18$, 95% CI $[.030, .327]$) and (b) disempowering climates with relatedness frustration ($r_{\text{diff}} = .18$, 95% CI $[.015, .331]$). Taken together, the associations between coach-created motivational climates and psychological need satisfaction/frustration were stronger for high school than college level in female athletes, but stronger for college than high school level in male athletes.

Discussion

In this study, we examined the intersections of athletes' gender (male, female), race/ethnicity (Black, Hispanic/Latinx, White), and sport level (high school, college) in relation to their perceptions of coach-created motivational climates and psychological need satisfaction and frustration. Although no three-way interaction was significant, we found significant gender by race interactions in both athletes' perceptions of coach-created climates and their need satisfaction and frustration, and gender by sport level interactions only in athletes' perceptions of coach-created climates. We also found a significant main effect of sport level in relation to the athletes' psychological needs. Based on our initial findings, we also compared the correlations between these variables across gender by race and gender by sport level subgroups. Significantly different correlations found between coach-created motivational climates and psychological needs primarily indicated stronger relationships for high school female than high school male athletes.

Black male athletes perceived the coach-created climate as being more disempowering and more frustrating of their psychological needs than White male athletes and female athletes of all races/ethnicities; effect sizes were small for all significant differences. These results are consistent with past research on Black male athletes' negative experiences (e.g., Singer, 2005; Yearwood, 2018) and indicate the importance of considering the intersection of identities in understanding athletes' perceptions of their sport environments. The perceived ego involving and controlling coach-created climates, and greater frustrations of all three psychological needs, may result from Black male athletes often being forced to play certain positions and show athleticism rooted in gender and racial stereotypes and assumptions about their abilities (Cooper et al., 2013; Singer, 2005). Additionally, Black male athletes experience a high level of racism and structural violence—a form of violence that is systemic, direct, and grounded in social order—tied to Black

masculinity (Yearwood, 2018). For Black male athletes, the term “student-athletes” is often racialized and gendered, where their physical prowess is highlighted and their intelligence deemphasized. For example, Yearwood (2018) noted from his ethnographic research that “under the rubric of athletes, their [Black male athletes’] lives were managed to the extreme. Almost every facet of their lived experience was decided by coaches and other administrations in athletics” (p. 22). Taken together, it is not surprising that the racialized and gendered experiences of Black male athletes are associated with feeling controlled, judged, unsupported, disconnected, and inadequate. Therefore, when working with Black male athletes, coaches must consciously disrupt these racialized and gendered ideas and create empowering climates that promote (vs. disempowering climates that hinder) need satisfaction, adaptive motivation, and wellbeing. To do so, coaches can focus on what athletes ought to pursue (e.g., intrinsic over extrinsic goals), why athletes participate in sport (e.g., connection with others), and how coaches and athletes can be respectful and caring in their interactions (e.g., conversations about identities and goals beyond sport; Duda, 2013).

On the other hand, Black female athletes had the most positive appraisals of the motivational factors, perceiving their coach-created climates as being more empowering compared with Black and White male athletes; they also perceived their psychological needs as being more satisfied compared with Hispanic/Latinx female, White female, Black male, and White male athletes. Therefore, the assumptions of the intersectional framework and research did not hold in this study regarding the dominance of maleness (i.e., masculinity) and Whiteness and marginalization of femaleness (i.e., femininity) and other racial/ ethnic identities in sport (Lim et al., 2021). At the same time, it is important to note that Black female athletes’ relatively positive perceptions of their experience do not mean they are not affected by racism or oppression in sport. It is plausible that their high athletic identity and status make them less conscious of the systemic racism and oppression in their broader sport contexts (Carter-Francique, 2018; Withycombe, 2011).

Several qualitative studies on intersectionality and Black female athletes’ experiences, however, provide context for our results. For instance, Withycombe (2011) revealed that Black female athletes had both empowering and disempowering experiences in sport. Despite experiencing stereotypes, the Black female athletes explained that sport was a “safe haven” where they could demonstrate talent, work hard, and have the opportunity to play and succeed, regardless of their race. Such perceptions would align with Black female athletes feeling more competent. Further, Black female athletes viewed being a student-athlete as a means to gain power, control, and social status, which could lead to increased satisfaction of autonomy (Carter-Francique et al., 2017; Simien et al., 2019). Along with the power and privilege associated with being students athletes, a sense of belonging, and subsequently relatedness satisfaction, seems to emerge from Black female athletes’ team affiliation, social status, and interconnected forms of accessible capital (e.g., athletics support staff), which provide them with social support and positive experiences (Carter-Francique, 2018; Cooper, Porter, & Davis, 2017). Assessing marginalized athletes’ identities and perceptions of motivational climates and psychological needs in nonsport contexts can help researchers and practitioners more fully understand their sport and educational experiences.

These findings of greater need satisfaction in Black female athletes are also in line with an early study of intersectionality that showed positive integration, perceived social advantage, and adaptive transition to predominantly White Division I institutions among Black female athletes, compared with Black male athletes with similar precollege characteristics (Sellers et al., 1997). It is plausible that family and peer support, beyond coach support, might play an important role in satisfying the psychological needs of Black female athletes (Cooper, Porter, & Davis, 2017),

especially given that the collegiate female athletes in our study generally perceived their sport environments as being more disempowering than other gender by sport level subgroups. Additionally, recent social justice movements against sexual and racial/ethnic inequities have facilitated the development of sport environments where individuals with corresponding marginalized identities, such as Black female athletes, can express their experiences and needs more openly. Female athletes and athletes of color also have significantly more positive perceptions about activism and more intentions to engage in activism than male athletes and White athletes, respectively (Mac Intosh et al., 2020). These positive perceptions might further contribute to Black female athletes having their psychological needs met. Additionally, the associations between empowering climates and competence frustration were stronger for Black female than Black male athletes in our study. Thus, solidarity and support, if coming from coaches, would seem to be particularly important for protecting Black female athletes' competence from being frustrated.

With regard to sport level, collegiate female athletes perceived more disempowering coach-created climates than collegiate male athletes and high school male and female athletes. These perceptions are supported by previous findings that showed high school (vs. collegiate) athletes perceive more autonomy support from coaches and that female (vs. male) athletes have more positive motivational profiles (Amorose & Anderson-Butcher, 2007). Through an intersectional lens, high school female (vs. male) athletes are generally viewed as less athletic and perceive lower performance expectations but receive more social support from coaches (Saarinen et al., 2022). As collegiate (vs. high school) athletes tend to experience more pressure and higher performance expectations, the athletic transition from high school to college level might have caused increased perceptions of controlling climates and distrust or disrespect by coaches, especially for female athletes who have higher preferences for a democratic coaching style than their male counterparts (Amorose & Horn, 2000). Thus, it would seem particularly important to conduct motivational climate interventions with college coaches who coach females, especially those transitioning from high school to college level. Doing so could help identify and influence the coaching behaviors and sport environments leading to collegiate female athletes' heightened perceptions of disempowering climates. Moreover, motivational interventions (e.g., cognitive restructuring and mindfulness/acceptance techniques) might be offered to collegiate female athletes early to help them prevent or cope with potential perceptions of disempowering climates and less social support from their coaches. Such interventions also have the potential to maintain the prominent roles of coach created climates in satisfying psychological needs, found among high school (vs. collegiate) female athletes in our exploratory correlation comparisons.

Although high school female athletes perceived more empowering coach-created climates than collegiate male and collegiate female athletes, collegiate athletes seemed to experience slightly greater need satisfaction than high school athletes. Collegiate athletes may perceive more relatedness satisfaction than high school athletes due to the nature of the college sport environment in which athletes train and spend more time together with their teammates, who often become their family away from home. Collegiate athletes might also gain a sense of connectedness through their teammates and other sources (e.g., strength and conditioning coaches, academic support staff) available in the college sport environment, which could serve as a buffer to disempowering coach created climate, especially for Black female athletes (Carter-Francique, 2018; Simien et al., 2019). On the contrary, high school athletes may have additional social constraints, typically stemming from parental expectations (Weiss, 2015), which could cause relatedness frustration. Despite greater relatedness satisfaction, collegiate athletes may perceive more autonomy frustration compared with high school athletes due to feeling controlled

by athletic scholarships (Kingston et al., 2006; Moller & Sheldon, 2020) and having more intense athletic, academic, and social demands (Martinent & Decret, 2015).

Study Limitations

Although our study findings help advance the understanding of the intersecting identities of gender, race/ethnicity, and sport level in relation to athlete perceptions of motivational factors, several limitations need to be addressed. First, the athletes from which we collected data were in the Southwestern and Southeastern regions of the United States. Therefore, our findings may not generalize to other geographical regions or samples with different demographic compositions. Second, athletes in our study self-identified solely within the gender binary (though nonbinary options were available), and thus the experiences of transgendered and gender-nonconforming athletes were not represented. Additionally, we did not assess the gender or race/ethnicity of the athletes' coaches, which could have played a role in how athletes experienced their sport environments. Considering the facilitative influence of identity role models and social support (Lavoie et al., 2019), athletes who "matched" their coaches on certain identities might perceive the coach-created climates more positively. Finally, this quantitative study provided a preliminary understanding of motivational factors (i.e., the "what") that may vary across intersecting identities, but it could not answer the questions of the "why" and "how" of such differences.

Future Research Directions

More research investigating athletes' perceptions of coach-created climates and need satisfaction and frustration in schools with various demographic compositions (e.g., predominantly White vs. historically Black vs. Hispanic serving) is needed. Due to the important roles that different gender expressions and sexual orientations have played in athletics in recent years, these intersecting identities including lesbian, gay, bisexual, transgender, queer or questioning, or another diverse gender identity and gender-nonconforming athletes should be studied in future research. Researchers can recruit these athletes along with those from other racial/ethnic groups through oversampling due to their underrepresentation in athletics. Investigating additional marginalized identities in intersectional sport research could help further understand differences in coach-created climates and psychological needs found in our study. Beyond athletes' intersecting identities, future studies should also take coaches' intersecting identities into account.

When studying the relationships between various motivational factors (e.g., relationships between coach-created climates and psychological needs), researchers can expand on our research by recruiting larger subsamples from intersecting groups and using more sophisticated analyses, such as structural equation modeling and invariance testing. Researchers may also use a person-centered approach through latent profile analysis to explore whether, and how, the patterns of coach-created climates and psychological needs might differ across identities. To further understand the reasons and mechanisms for the differences in motivational variables examined in this study and beyond, additional variables (e.g., potential influence of revenue-producing sports and scholarships, individual vs. team-level factors, actual vs. athlete/coach perceptions of coach-created climates) should be considered. For the same purpose, qualitative or mixed-method studies are needed. For instance, researchers can conduct interviews with marginalized athletes to explore how various instances of athlete activism since 2020 might have provided opportunities for athletes with marginalized identities to support each other in safe settings (e.g., Brooks & Knox, 2022). This solidarity and support for athlete activism,

unavailable in past studies of intersectionality in sport (Simien et al., 2019), may satisfy psychological needs in and outside of sport.

Conclusion

This study, as one of the first attempts to apply intersectionality in studying motivational factors in sport, shows the theoretical and practical significance of considering how multiple identities, especially gender and race/ethnicity, interact together (Lim et al., 2021; Withycombe, 2011; Yearwood, 2018). The findings imply the potential harm of Black masculinity in sport as Black male athletes perceive relatively more disempowering coach-created climates and psychological need frustration compared with all other gender by race combinations. Coaches and athletic staff ought to participate in motivational climate training and implement strategies that help mitigate racialized and gendered experiences in sport, especially for Black male athletes. On the other hand, motivational interventions might be offered to athletes, especially females who transition from high school to college athletics, to help them cope with their overall perceptions of more disempowering climates and less social support from their coaches in college.

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¹ Using the CI of the difference provides a clear interpretation, which is lacking when the CIs of two separate point estimates are examined for significance. When comparing the point estimates for correlations, the only clear interpretation of a significant difference is when two CIs do not overlap at all. However, when two CIs overlap, the point estimates may or may not significantly differ from each other. For example, the correlations between disempowerment climates and autonomy satisfaction for high school female athletes ($r = -.55$, 95% CI $[-.65, -.42]$) and high school male athletes ($r = -.35$, 95% CI $[-.46, -.23]$) had CIs that overlap, but the CI of their correlation difference (95% CI $[-0.36, -0.04]$) did not include 0 and was thus significant.