THE ROLES OF COACHES, PEERS, AND PARENTS IN HIGH SCHOOL ATHLETES'

MOTIVATIONAL PROCESSES: A MIXED-METHODS STUDY

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Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

August 2018

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Chu, Tsz Lun. *The Roles of Coaches, Peers, and Parents in High School Athletes' Motivational Processes: A Mixed-Methods Study*. Doctor of Philosophy (Educational Psychology), August 2018, 250 pp., 24 tables, 16 figures, chapter references.

Grounded in self-determination theory and achievement goal theory, the purpose of this mixed-methods study was to examine the underlying motivational processes from social environments created by coaches, peers, and parents to motivational outcomes in high school athletes, with an emphasis on the relative influence of social agents in basic psychological needs (i.e., autonomy, competence, and relatedness). The quantitative part of this study tested a hierarchical model of high school sport motivation in a final sample of 311 student athletes (204 boys, 107 girls) using structural equation modeling: social factors (coach-, peer-, and parent-created motivational climates) -> psychological mediators (need satisfaction and frustration) -> types of motivation (autonomous motivation, controlled motivation, and amotivation) -> consequences (subjective vitality, athlete burnout, and intention to drop out). Invariance across gender and across team type (varsity vs. non-varsity) was also tested. Adequate model fits were achieved in separate "brighter side" and "darker side" models across the overall sample, gender, and team type. The follow-up qualitative part of this study explored "how" beyond "what" coaches, peers, and parents contribute to the social environments, need frustration, and negative motivational outcomes in sport in a subsample of 37 student athletes (24 boys, 13 girls) who reported high amotivation/burnout and higher than average dropout intentions in the quantitative survey. Content analysis and observation were conducted to interpret the focus group interview data among athletes across gender and team type. The results of both quantitative and qualitative parts were integrated and compared to summarize the roles of coaches, peers, and parents in the "brighter and darker sides" of athletic experience in high school athletes.

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PSYCHOLOGICAL NEEDS: A SYSTEMATIC REVIEW

Abstract

Objectives: Grounded in self-determination theory (SDT) and achievement goal theory

(AGT), the purposes of this systematic review were to summarize (a) the literature on the

positive and negative social environments created by coaches, peers, and parents concurrently,

(b) the relative influence of the three social agents in satisfaction and frustration of youth

athletes' psychological needs (i.e., autonomy, competence, and relatedness), and (c) emerging

research gaps for future research and practical implications for youth sport programs. Methods:

Literature was searched in six databases, resulting in 20 final studies (12 quantitative, 8

qualitative; 18 peer-review articles, 2 dissertations) with 2851 athlete participants (mostly

adolescents and young adults) for data extraction. These studies were analyzed and synthesized

based on the theoretical frameworks, research design, participants and sports, assessment of and

associations between the social environments and psychological needs, data analyses, results,

and limitations. Results: Research evidence shows that coaches, peers, and parents served

different roles in satisfaction and frustration of youth athletes' psychological needs. Coaches

were the most important social agent in influencing autonomy, while peers were the most

important social agent in influencing competence and relatedness. Parental influence was not

critical, but was also the least studied in the literature. Conclusions: Coaches, sport program

coordinators, and parents should work together to enhance social environments in youth sports

by creating a motivational climate that is task-involving, autonomy-supportive, and socially-

supportive. More research, particularly mixed-methods studies, is needed to study the relative

influence of all three social agents in youth sport contexts.

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Introduction

Youth sport participation in the United States has increased gradually to more than 60 million children and adolescents playing on a sports team (National Council of Youth Sports, 2008). Given that youth sports are one of the most popular leisure activities in which school-aged children and adolescents engage (Merkel, 2013), the sport experience of athletes is important in their physical and psychosocial development across developmental stages. Organized youth sports serve as a significant vehicle for children and adolescents to be physically active and maintain healthy weight (Drake et al., 2012). Although sport involvement produces many physical and psychosocial health benefits, sport participation decreases (Kann et al., 2014) and sport dropout increases (Balish, McLaren, Rainham, & Blanchard, 2014) across the lifespan of athletes. The athletes who drop out of youth sports frequently report that they lack quality friendships and relationships with coaches in sports (Balish et al., 2014). Therefore, social environments created by social agents in sports (i.e., coaches, peers, and parents) and their interpersonal relationships with athletes can influence youth athletes' sport motivation, which warrants research attention. Self-determination theory (SDT; Deci & Ryan, 1985, 2000; Ryan & Deci, 2017) and achievement goal theory (AGT; Ames, 1992; Nicholls, 1989) are two prominent theoretical frameworks to explain sport motivation as well as the influence of social agents in sports (Keegan, Spray, Harwood, & Lavallee, 2014b).

Theoretical Frameworks

According to SDT, autonomy, competence, and relatedness are three basic psychological needs that must be satisfied in order to help individuals achieve intrinsic motivation and psychosocial well-being (Ryan & Deci, 2000b). Autonomy refers to the experience of volition

and having control; competence refers to a sense of effectiveness in an environment; and relatedness refers to a sense of belonging and connection with others in a given social environment (Deci & Ryan, 2000). One way to satisfy these three psychological needs in youth sport is to foster positive social environments through support from social agents, namely, coaches, peers and parents. Thus, the fulfillment of these psychological needs by coaches within the sport context is likely to increase sport motivation and positive outcomes in athletes. SDT further indicates that social environments are essential to the facilitation of self-determined motivation and adaptive motivational outcomes (Deci & Ryan, 2008). For instance, perceived autonomy support from coaches promotes athletes' psychological need satisfaction, and in turn, greater positive emotions and less burnout symptoms (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011). On the other hand, psychological needs of individuals can be frustrated, which may lead to negative motivational outcomes and ill-being (Ryan & Deci, 2000a; Vansteenkiste & Ryan, 2013). For example, controlling behavior of coaches contributes to athletes' psychological need frustration, and in turn, greater depressive symptoms and lower psychological well-being (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011).

Achievement goal theory is another theoretical framework for studying the influence of social agents in sports in terms of motivational climate (Ames, 1992). Motivational climate refers to the social environment that operates in achievement contexts and is fostered by significant others, such as coaches, peers, and parents in sport contexts. AGT classifies motivational climates into two different types based on the definition of competence (Ames, 1992): a task-involving climate emphasizes effort, personal improvement, and task mastery, whereas an ego-involving climate emphasizes normative evaluations and outperforming others. Indeed, these two climates largely co-exist in sport contexts, that is, the social environment is

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both task-involving and ego-involving to certain extents. Previous research has shown the positive effects of a task-involving climate and the negative effects of an ego-involving climate (created by coaches and peers) on intrinsic motivation and intention to continue sport, which are mediated by psychological need satisfaction (Alvarez, Balaguer, Castillo, & Duda, 2012; Jõesaar, Hein, & Hagger, 2011).

Social Agents and Social Environments

Grounded in SDT, Vallerand (1997) proposed the hierarchical model of intrinsic and extrinsic motivation (HMIEM) to study the motivational sequence of "social factors, psychological mediators, types of motivation, [and] consequences." Within the context of youth sports, coaches, peers, and parents are three significant social agents who contribute to the social factors (e.g., motivational climates) proposed by SDT and AGT (Keegan, Harwood, Spray, & Lavallee, 2009; Keegan, Spray, Harwood, & Lavallee, 2010), and can in turn influence satisfaction and frustration of psychological needs as well as motivational outcomes in sport. Because "athletes may experience the motivational 'pull and push' from varying social agents" (Harwood, Keegan, Smith, & Raine, 2015, p. 20), coaches, peers, and parents may create different types of positive and negative social environments that affect satisfaction and frustration of psychological needs, respectively. It is important to examine the interactive effects of influence from these three social agents, yet most youth sport studies only focus on the social environments created by coaches (Harwood et al., 2015). Harwood and colleagues (2015) conducted a systematic review of motivational climates in sport and physical activity based on AGT; they found only five published articles studying parent-created climate and three studying peer-created climate. Other intrapersonal and interpersonal social factors, such as autonomy

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support and controlling behavior based on SDT, were not included in their review. Therefore, this review sought to provide more empirical evidence of the influence of social agents in sport, particularly the concurrent examination of either two or all three social agents in relation to psychological need satisfaction and frustration in athletes.

The relative influence of coaches, peers, and parents may change across the lifespan of athletes depending on their developmental stages and sport involvement. Research has shown that while coaches are a consistent, key social agent in sports, peer influence increases and parental influence decreases during adolescence. Keegan and colleagues (2014b) performed a qualitative synthesis and meta-interpretation of studies on social motivational influences in athletes and indicated that the roles of the three social agents changed across three athletic career stages—initiation-sampling (aged 4–12 years), specialization (aged 11–18 years), and investment-mastery (aged 15–30 years)—in which coaches and peers gradually became more influential while parental influence diminished. Keegan and colleagues (2014b) further noted that, however, most literature in this line of research implemented quantitative research methods using surveys for data collection. Therefore, this review examined the roles and relative influence of the three social agents, guided by SDT and AGT, by synthesizing both quantitative and qualitative evidence with regard to psychological need satisfaction and frustration in athletes.

Taken together, the purpose of this systematic review was threefold: (a) to examine different types of positive and negative social environments created by coaches, peers, and parents concurrently; (b) to study the relative influence of social agents on youth athletes' psychological need satisfaction and frustration; and (c) to synthesize the findings from the

literature and offer recommendations for future research (quantitative and qualitative) and practical implications for youth sport coaching and parenting.

Methods

Search Strategies

A systematic search of literature was completed through six electronic databases (Academic Research Complete, ERIC, PsycINFO, SportDiscus, Web of Science, and ProQuest Dissertations & Theses Global) from the inception of SDT (i.e., 1985) to September 2017. The following keywords were used in the search: (psychological need*) AND (sport*) AND (coach* OR peer* OR teammate* OR parent*). This search included published journal articles (peer-reviewed) and doctoral dissertations with available full texts and English abstracts. Doctoral dissertations were included for two reasons: (a) limited published studies have examined social environments created by more than one social agent concurrently (Harwood et al., 2015; Keegan et al., 2014b); and (b) this inclusion, to some extent, reduced publication bias—studies with positive and significant results more likely getting published and reported (Dwan, Gamble, Williamson, & Kirkham, 2013). Citations in the eligible articles and dissertations were also examined to identify potential studies which might not have been included in the initial database search. This search strategy results in a total of 361 published articles and dissertations.

Selection Criteria

The study selection process used the following inclusion criteria: (a) provided empirical evidence as original studies (i.e., not a review); (b) included participants who were current or former athletes who had competitive sport experience; (c) not studied participants who were

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special populations (e.g., physical or mental illness); (d) examined social environments created by more than one social agent of the coach-athlete-parent triad in sport contexts; and (e) contained quantitative (e.g., correlation) and/or qualitative (e.g., categories) findings for the relations between social environments and at least one of the basic psychological needs (i.e., autonomy, competence, or relatedness). If doctoral dissertation studies fit these criteria, additional inclusion criteria were implemented to assure their quality (Hart, 1998): (a) specialized and made a new contribution to the literature on social environments and psychological needs; (b) demonstrated a high level of scholarship with appropriate methodologies and corresponding analyses (e.g., validity, reliability, and trustworthiness); and (c) showed originality in the purpose and/or research questions of the study (i.e., not a replication study). Although the coach-athlete-parent triad might be more applicable to youth sport contexts, athletes from children to young adults were included in this review to show potential differences and progression in the roles of three social agents across developmental stages (Keegan et al., 2014b).

A screening procedure was used to retain relevant and exclude irrelevant studies using a two-stage systematic approach (Armour & MacDonald, 2012): (a) read and excluded all abstracts that did not meet one or more selection criteria; (b) retrieved the relevant abstracts after checking for appropriateness of the study participants and constructs. This screening resulted in an extraction of 33 full-text studies (see Figure 1), including 27 peer-reviewed articles and six doctoral dissertations. Upon further screening of the full texts, seven peer-reviewed articles and four dissertations were excluded, either due to not including basic psychological needs in their investigation, or because of an overlap between published articles (Felton & Jowett, 2013; Gledhill & Harwood, 2015) and the original dissertations.

Academic Search Complete	ERIC	PsycINFO	SportDiscus	Web of Science	ProQuest Dissertation & Theses Global
90 Citation(s)	20 Citation(s)	148 Citation(s)	134 Citation(s)	59 Citation(s)	120 Citation(s)

361 Non-Duplicate Citations Screened

Inclusion/Exclusion Criteria Applied in Abstract Screening

328 Citations Excluded After Abstract Screening

33 Full Texts Retrieved

Inclusion/Exclusion Criteria Applied in Full-Text Screening

11 Studies Excluded After Full-Text Screening

2 Studies Excluded During Data Extraction

20 Final Studies Included

Figure 1. The PRISMA flow diagram showing the literature search and selection process.

In the data extraction process, two more peer-reviewed articles were excluded due to an absence of evidence regarding the relations between social environments and psychological needs. This exclusion resulted in the final 20 studies (18 peer-reviewed articles, 2 dissertations) for data extraction and analysis in this systematic review.

Data Extraction and Analysis

The data of the 20 studies were extracted and analyzed in four steps: (a) read the abstract to familiarize with the content; (b) summarized the article information concerning the author names, theoretical frameworks, research design, participant characteristics and related sport background, assessment period, social environments studied, data analyses and results regarding satisfaction and frustration of psychological needs, and study limitations (see Table 1, 2, and 3); (c) read the methods, results, and discussion sections in detail to determine the relative influence of coaches, peers, and parents on satisfaction and frustration psychological needs; and (d) made notes on the specific methodologies and unique findings of the studies. The characteristics of the literature were summarized, and the corresponding quantitative and qualitative findings were synthesized in the results section, respectively.

Results

Theoretical Background and Research Design

Table 1 provides a summary of the study background and participants of the 20 extracted studies. Among these studies, 19 were published in English and one was published in Spanish with an English abstract (Sánchez-Oliva, Leo, González-Ponce, Chamorro, & García-Calvo, 2012) between 2003 and 2017. Information from the Spanish articles was retrieved through

translation to English using an online tool (https://www.onlinedoctranslator.com). Of the 18 peer-reviewed articles, 17 conducted a single study and one conducted two studies (Hodge & Gucciardi, 2015) published in journals related to the field of sport and exercise psychology and sport sciences. Only Study 2 of Hodge and Gucciardi's article (2015) was extracted due to the purpose of this review. The two doctoral dissertations achieved the quality criteria established in the methods section, indicating a high level of scholarship and appropriateness for review. One doctoral dissertation included a single study (Fraina, 2017); the other included three studies (Khalaf, 2014), though only Study 2 was extracted based on the purpose of this review. All studies but one (Gledhill & Harwood, 2015) mentioned SDT as a theoretical framework of the study, whereas Gledhill and Harwood (2015) applied a theory of talent development and career transitions in their study. Five studies (Almagro, Sáenz-López, Moreno-Murcia, & Spray, 2015; Keegan et al., 2009, 2010; Keegan, Spray, Harwood, & Lavallee, 2014a; Sánchez-Oliva et al., 2012) also integrated AGT, and one study (Felton & Jowett, 2013) integrated attachment theory (Bowlby, 1958) alongside SDT.

Of the 20 studies, 12 employed a quantitative and eight employed a qualitative research design. No mixed-methods studies were found. Among the quantitative studies, 11 used a cross-sectional and only one used a longitudinal design (Kipp & Weiss, 2015), which was an extension of a previous study by the same authors (Kipp & Weiss, 2013). All quantitative studies included surveys, and one included an additional diary. Among the qualitative studies, seven used a cross-sectional and only one used a longitudinal design (Raabe & Readdy, 2016). All qualitative studies collected data through interviews, in which five conducted individual interviews, two conducted focus groups, and one conducted both types (Keegan et al., 2014a).

Participant Characteristics

Quantitative Studies

The number of participants in each of the 12 studies ranged from 45 to 362 ($M = 220.17$; 35.2% males, 64.8% females), resulting in a total of 2642 athletes. All participants were athletes aged 10–35 years; most studies sampled a wide range of ages, whereas one sampled only adolescents aged 12–15 (Riley & Smith, 2011), two sampled only high school-aged athletes (Blanchard, Amiot, Perreault, Vallerand, & Provencher, 2009; Fraina, 2017), and two sampled only college-aged athletes (Hodge & Gucciardi, 2015; Raabe & Zakrajsek, 2017). One study included only males (Taylor & Bruner, 2012) and two studies included only females (Gagné, Ryan, & Bargmann, 2003; Khalaf, 2014; Kipp & Weiss, 2013, 2015) as participants. Eight of the 12 studies investigated single-sport contexts, including basketball (Blanchard et al., 2009; Riley & Smith, 2011; Sánchez-Oliva et al., 2012), gymnastics (Gagné et al., 2003; Kipp & Weiss, 2013, 2015), soccer (Taylor & Bruner, 2012), and track and field (Khalaf, 2014), while the other four examined multiple-sport contexts varying from individual sports (e.g., cross country, tennis) to team sports (e.g., American football, baseball, field hockey, softball). The competitive level of athletes varied within and between studies, some of which included professional and international levels (Felton & Jowett, 2013; Hodge & Gucciardi, 2015; Khalaf, 2014; Kipp & Weiss, 2013, 2015). Most studies were conducted in the U.S. ($n = 6$), followed by the U.K. ($n = 2$) and Canada/New Zealand/Spain/Egypt ($n = 1$). The majority of the participants were White/Caucasian.

Qualitative Studies

The number of athlete participants in each of the eight studies ranged from 10 to 79 ($M = $

26.13; 50.2% males, 49.8% females), resulting in a total of 209 athletes. All athletes were aged 7–29 years; most studies sampled a wide range of ages, whereas one sampled only children below 12 (Keegan et al., 2009), one sampled only adolescents aged 13–16 (Almagro et al., 2015), and two sampled only college-aged athletes (Kimball, 2007; Raabe & Readdy, 2016). Although most studies recruited only current athletes of both genders, two studies included dropout athletes who were females: Gledhill and Harwood (2015) studied only former female soccer players while including their coaches, teachers, and female best friends as participants for triangulation of data sources; Williams and colleagues (Williams, Whipp, Jackson, & Dimmock, 2013) studied both active ($n = 5$) and inactive ($n = 5$) female golfers.

Three of the eight qualitative studies investigated single-sport contexts, including soccer (Gledhill & Harwood, 2015), golf (Williams et al., 2013), and cheerleading (Raabe & Readdy, 2016), while the other five examined multiple-sport contexts varying from individual sports (e.g., swimming, tennis) to team sports (e.g., American football, volleyball, handball). Keegan and colleagues (2010) included participants from the greatest variety of sports ($n = 26$). The competitive level of athletes varied within and between studies, most of which included regional and national levels, while Keegan and colleagues (2014a) included professional and international levels. Half of the studies were conducted in the U.K. ($n = 4$), followed by the U.S. ($n = 2$) and Australia/Spain ($n = 1$). The majority of the participants were White/Caucasian.

Table 1

*Summary of the Design and Participants of the Extracted Studies (*N = 20*)*

ID	Author(s)	Purpose	Theories	Design	Participants	Sports and levels	Country
1	Almagro et al. (2015)	To examine how athletes perceived autonomy support from coaches, basic psychological need satisfaction, and sport motivation	SDT and 2 × 2 AGT	Cross-sectional; individual interview	15 sport participants aged 13–16 years (*M* = 14.67) from sport clubs; 9 males, 6 females	Soccer, basketball, volleyball, tennis, handball, athletics, and swimming; provincial, state, and national levels	Spain
2	Blanchard et al. (2009)	To test the impact of cohesiveness and coaches' controlling interpersonal style on athletes' perceptions of autonomy, competence, and relatedness	SDT	Cross-sectional; quantitative survey	197 athletes aged 16–22 years (*M* = 18) playing in an inter-cegep (i.e., Grade 12) league; 59% males, 37% females, 4% unreported	Basketball; 3 months to 12 years on a team	Canada
3	Felton & Jowett (2013)	To explore the mediating role of social factors on the associations between attachment styles and basic psychological needs satisfaction within two relational contexts.	SDT and attachment theory	Cross-sectional; quantitative survey	215 athletes aged 15–35 years, mostly of university age (*M* = 20.56); 41% males, 59% females	A range of individual (40%) and team (60%) sports; from club through university to national and international levels	U.K.
4	Fraina (2017)	To develop a stronger comprehension of the factors that motivate adolescents, especially those from vulnerable circumstances, to participate in sport	SDT	Cross-sectional; quantitative survey	136 athletes from 8 urban high schools; 102 males, 34 females	Football, lacrosse, soccer, basketball, baseball, softball, volleyball, hockey, track and field, and cheerleading; junior varsity and varsity teams	U.S.
5	Gagné et al. (2003)	To examine the effects of young athletes' perceptions of support from coaches and parents on their need satisfaction, motivation, and well-being	SDT	Cross-sectional; quantitative survey and diary	45 athletes aged 7–18 years (*M* = 13) from a competition team; all females	Gymnastics; 1–11 years (median = 6) of practice	U.S.

(table continues)

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ID	Author(s)	Purpose	Theories	Design	Participants	Sports and levels	Country
6	Gledhill & Harwood (2015)	To examine career experiences of U.K.-based female youth soccer players from a holistic perspective with a view to producing a grounded theory of factors contributing to talent development and career transitions in U.K. youth female soccer	Talent development and career transitions	Cross-sectional; individual interviews	13 former players (M = 19.61 years) who had withdrawn from competitive soccer; all females. Sequential sample of 4 former coaches (3 males), 13 female best friends, and 8 former teachers (6 males) of the players	Soccer; joined player development center programs, but not progressed into leagues or international teams	U.K.
7	Hodge & Gucciardi (2015)	To examine whether the relationships between contextual factors and basic psychological needs were related to antisocial and prosocial behavior in sport	SDT	Cross-sectional; quantitative survey	272 university athletes (M = 19.49 years); 40% males, 60% females	Team sports; from club through provincial to national levels (M = 9.90 years of participation)	New Zealand
8	Khalaf (2014)	To assess the motivational sequence posited by SDT in the context of sports	SDT	Cross-sectional; quantitative survey	310 athletes aged 14–31 years (M = 19.19); all females	Track and field; from club through university to national and international levels (M = 5.77 years of participation)	Egypt
9	Keegan et al. (2009)	To re-examine the concept of 'motivational climate' based on recent developments studied the influences of coaches, parents, and peers on sport motivation of young athletes	SDT and AGT	Cross-sectional; focus-group interviews	40 sport participants aged 7–11 years (M = 9.58), who played sport in spare time; 21 males, 19 males	17 sports; <3 years of participation	U.K.
10	Keegan et al. (2010)	To examine the motivationally relevant behaviors of coaches, parents, and peers in specializing sport participants	SDT and AGT	Cross-sectional; focus-group interviews	79 specializing sport participants aged 9–18 years (M = 12.93), who played sport in spare time; 43 males, 36 females	26 sports; 2–6 years of sport experience	U.K.
11	Keegan et al. (2014)	To examine the construction of the motivational climate surrounding elite athletes in relation to the behaviors of coaches, peers, and parents	SDT and AGT	Cross-sectional; individual and focus-group interviews	28 sport participants aged 15–29 years (M = 20.25) with; 23 males, 5 females	8 sports; national and international levels (>8 years of participation)	U.K.

ID	Author(s)	Purpose	Theories	Design	Participants	Sports and levels	Country
12	Kimball (2007)	To assess collegiate student-athletes' perceptions of autonomy	SDT	Cross-sectional; individual interviews	12 collegiate athletes from freshman to senior; 7 males, 5 females	Basketball, football, track, and golf; College Division I	U.S.
13	Kipp & Weiss (2013)	To examine relationships among coach and teammate behaviors, psychological need satisfaction, and well-being among female adolescent gymnasts	SDT	Cross-sectional; quantitative survey	303 athletes aged 10–17 years ($M = 13$) who competed in U.S. Gymnastics-sanctioned meets; all females	Gymnastics; varying skill level ($M = 15.5$ hours of training per week)	U.S.
14	Kipp & Weiss (2015)	To examine longitudinal relationships among perceived social influences, psychological need satisfaction, and well-being among female adolescent gymnasts	SDT	Longitudinal; quantitative survey	174 athletes aged 10–18 years ($M = 13.5$) who competed in U.S. Gymnastics-sanctioned meets; all females	Gymnastics; varying skill level ($M = 15.2$ hours of training per week)	U.S.
15	Raabe & Readdy (2016)	To explore motivational profiles and basic psychological need satisfaction across different contexts and situations that comprise the collegiate cheerleading environment	SDT	Longitudinal; individual interviews	12 NCAA Division I student-athletes aged 18–22 years ($M = 19.3$) from one university; 2 males, 10 females	Cheerleading; 11 participants on athletic scholarship	U.S.
16	Raabe & Zakrajsek (2017)	To assess (a) if there were differences between coaches' and teammates' influence on psychological need satisfaction; (b) potential differences regarding the impact of coaches and teammates between interactive and coactive sports; (c) whether coaches' and teammates' influence affected perception of, and satisfaction with, individual and team performance	SDT	Cross-sectional; quantitative online survey	362 NCAA Division I student-athletes aged 18–24 years ($M = 19.36$); 136 males, 226 females	Track and field, cross country, soccer, basketball, and tennis; 235 participants on athletic scholarship	U.S.
17	Riley & Smith (2011)	To examine the association of perceived coach-athlete and peer relationships with self-determined motivation for sport in young athletes	SDT	Cross-sectional; quantitative survey	211 middle and high school players aged 12–15 years ($M = 13.5$) from 29 teams; 90 males, 121 females	Basketball; $M = 7.6$ years of participation	U.S.

(table continues)

ID	Author(s)	Purpose	Theories	Design	Participants	Sports and levels	Country
18	Sánchez-Oliva et al. (2012)	To examine the importance of significant others on motivational aspects, and how these variables might influence involvement in basketball	SDT and AGT	Cross-sectional; quantitative survey	284 players aged 11–16 years ($M = 12.47$); 149 males, 135 females	Basketball; community team	Spain
19	Taylor & Bruner (2012)	To examine social-contextual correlates of players' developmental experiences in an elite youth soccer context	SDT	Cross-sectional; quantitative survey	133 players aged 11–18 years ($M = 14.23$) from four youth academies; all males	Soccer; three academies from the second tier and one academy from the fourth tier of professional soccer	U.K.
20	Williams et al. (2013)	To examine the putative role of relatedness support for retention in golf among young females	SDT	Cross-sectional; individual interviews	10 players aged 16–26 years ($M = 21.4$), including active ($n = 5$) and inactive ($n = 5$) participants; all females	Golf; played competitively at club and regional tournaments	Australia

Note. AGT = achievement goal theory; SDT = self-determination theory; NCAA = National Collegiate Athletic Association

Assessment of Social Environments and Psychological Needs

Quantitative Studies

Table 2 provides a summary of the data collection and analysis of the quantitative studies. Five of the 12 studies reported when the data were collected: pre-season (Kipp & Weiss, 2013, 2015), the beginning of a season (Blanchard et al., 2009; Riley & Smith, 2011), mid-season (Gagné et al., 2003), the end of a season or off-season (Kipp & Weiss, 2015). All studies used survey measures to assess social environments and psychological need satisfaction in the sport contexts, while Gagné and collegaues (2003) also included a diary to assess the psychological need satisfaction perceived by gymnasts "at the moment" after each of the 15 practices over a course of 4 weeks. Of the 12 studies, 10 examined social environments created by two social agents, that is, coach and peers ($n = 9$), or coach and parents (Gagné et al., 2003); only 2 studies examined those created by all three social agents (Khalaf, 2014; Sánchez-Oliva et al., 2012). The most frequently studied social environments were autonomy support from coaches ($n = 7$), followed by controlling behavior of coaches ($n = 5$), autonomy support from peers ($n = 4$), and friendship quality ($n = 3$). When measuring basic psychological needs, 9 studies used a single measure (3 used the Basic Need Satisfaction in Sport Scale [BNSSS; Ng, Lonsdale, & Hodge, 2011]), and 3 studies used respective measures to assess autonomy, competence, and relatedness satisfaction. Most studies assessed general need satisfaction in sport, whereas 4 studies included need satisfaction with respect to specific social agents: coach and peers (Kipp & Weiss, 2013, 2015[1]; Raabe & Zakrajsek, 2017), and coach and parents (Felton & Jowett, 2013). None of the studies assessed psychological need frustration.

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[1]Kipp and Weiss (2013, 2015) studied only relatedness, but not autonomy or competence, with specific social agents (i.e., coach and teammates).

Qualitative Studies

Table 3 provides a summary of the data collection and analysis of the quantitative studies. All eight studies used semi-structured interviews with open-ended questions to collect qualitative data, including face-to-face individual interviews ($n = 6$) and focus groups ($n = 3$).[2] Only one study reported when the data were collected: Raabe and Readdy (2016) conducted individual interviews with each of the 12 competitive cheerleaders who are student athletes at the beginning, middle, and end of the fall semester, respectively. They further included field notes and observations for data collection beyond interviews. Of the eight studies, five examined social environments created by all three social agents and three examined social environments created by coach and peers (Almagro et al., 2015; Kimball, 2007; Raabe & Zakrajsek, 2017). Most studies included assessment of social environments in relation to all autonomy, competence, and competence, but one respective study focused on autonomy (Kimball, 2007) and on relatedness (Williams et al., 2013) exclusively. Although the majority of the studies assessed both positive and negative social environments and psychological need satisfaction and frustration (i.e., brighter and darker sides of human existence; Ryan & Deci, 2000a), only one respective study focused on the "brighter side" (Raabe & Readdy, 2016) and on "the darker side" (Gledhill & Harwood, 2015).

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[2]Keegan et al. (2014) conducted a mix of 10 individual interviews and four focus groups

Table 2

Summary of Methods and Results in Quantitative Studies (N = 12)

ID	Author(s)	Assessment period	Coach Influence	Peer Influence	Parental Influence	Measures for BPN	Analysis	Autonomy	Competence	Relatedness	Limitation
2	Blanchard et al. (2009)	First month of the season	Control (–)	Cohesiveness (+)	N/A	Adapted need satisfaction scale by Gagné et al.'s (2003)	SEM	Coach ~ Peers ($r = -.14$ and $.15^*$; $\beta = -.30^*$ and $.29^*$)	Peers > Coach ($r = .13 > .04$; $\beta = .22^* > .01$)	Peers > Coach ($r = .48^* > -.01$; $\beta = .58^* > -.06$)	Low reliability for autonomy and control scales
3	Felton & Jowett (2013)	Unreported	Autonomy support (+); social support (+); control (–); conflict (–)	Autonomy support (+); social support (+); control (–); conflict (–)	N/A	BPNRS (La Guardia et al., 2000)	Multiple regression (mediation)	Coach > Parents (autonomy support: $b = .44^* > .33^*$; control: $b = -.22^* \sim .-20^*$)	N/A	Parents > Coach (social support: $b = .52^* > .43^*$; conflict: $b = -.18^* > .04$)	Attachment styles were measured at the global level rather than to specific agents
4	Fraina (2017)	Unreported	Autonomy support (+); competence support (+); relatedness support (+)	Autonomy support (+); competence support (+); relatedness support (+)	N/A	BNSPP (Ng et al., 2011)	Multiple regression (hierarchical)	Coach > Peers (autonomy support: $r = .66^* > .40^*$; $b = .50^* > .10$)	Peers > Coach (competence support: $r = .50^* > .24^*$; $b = .53^* > -.02$)	Peers > Coach (relatedness support: $r = .60^* > .45^*$; $b = .41^* > .20^*$)	Data were collected during no-competition period or the beginning of a season
5	Gagné et al. (2003)	15 practices over 4 weeks during the non-competing period of the season	Autonomy support (+); involvement (+)	N/A	Autonomy support (+); involvement (+)	Created a need satisfaction scale	Correlation	Coach > Parents (autonomy support: $r = .54^* > .23$; involvement: $r = .60^* > .37^*$)	Coach > Parents (autonomy support: $r = .33^* > .06$; involvement: $r = .37^* > .04$)	Coach > Parents (autonomy support: $r = .42^* > .37^*$; involvement: $r = .50^* > .35^*$)	Measure of need satisfaction led to problems of multicollinearity
7	Hodge & Gucciardi (2015)	Unreported	Autonomy support (+); control (–)	Autonomy support (+); control (–)	N/A	BNSSS (Ng et al., 2011)	Bayesian path analysis	Coach > Peers (autonomy support: $r = .43^* > .39^*$; $\beta = .36^* > .23^*$; control: $r = -.23^* \sim -.20^*$; $\beta = ns$)	Coach > Peers (autonomy support: $r = .31^* > .25^*$; $\beta = .31^* > .15^*$; control: $r = -.15^* \sim -.13^*$; $\beta = ns$)	Peers > Coach (autonomy support: $r = .57^* > .44^*$; $\beta = .45^* > .28^*$; control: $r = -.03 \sim -.02$; $\beta = ns$)	Some data were collected in off-season that athletes had to recall experiences retrospectively

(table continues)

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ID	Author(s)	Assessment period	Coach Influence	Peer Influence	Parental Influence	Measures for BPN	Analysis	Autonomy	Competence	Relatedness	Limitation
8	Khalaf (2014)	Unreported	Autonomy support (+); involvement (+); structure (+)	Autonomy support (+); involvement (+); structure (+)	Autonomy support (+); involvement (+); structure (+)	BNSSS (Ng et al., 2011)	SEM	Coach > Parents > Peers (r = .59* > .57* > .41*; β = .43* > .19* > .13*)	Coach > Parents > Peers (r = .55* > .47* > .42*; β = .36* > .21* > −16)	Peers > Coach ~ Parents (r = .49* ~ .48* > .45*; β = .30* > .21* ~ .22*)	Self-presentation biases might have led to report of high need satisfaction
13	Kipp & Weiss (2013)	Pre-season (trained for at least 3 months with their current coach)	Autonomy support (+); control (−)	Mastery (+); performance (−); friendship quality (+)	N/A	Autonomy scale by Hollembeak and Amorose (2005); Athletic competence subscale of SPPA (Harter, 1988); Relatedness subscale by Gagné et al. (2003)	SEM	Coach > Peers (mastery/ autonomy support: β = .61*; control: β = −.18*)	Peers > Coach (friendship quality: β = .16*)	Coach ~ Peers (mastery/ autonomy support for relatedness with coach: β = .76*; friendship quality for relatedness with teammates: β = .53*)	Low reliability for performance climate subscale validated in team sports, so some items might be problematic in individual sports
14	Kipp & Weiss (2015)	In season or just completed the season	Autonomy support (+); control (−)	Mastery (+); performance (−); friendship quality (+)	N/A	Autonomy scale by Hollembeak and Amorose (2005); Competence subscale of SPPA (Harter, 1988); Relatedness subscale by Gagné et al. (2003)	SEM	*ns* in SEM paths	Peers > Coach (mastery/ autonomy support: β = .17*; performance: β = .18*)	*ns* in SEM paths	Relatively low levels of performance climate; Controlling behaviors showed a poor fit in the model
15	Raabe & Zakrajsek (2017)	Unreported	Coaches' influence (+)	Teammates' influence (+)	N/A	Adapted BPNS (Deci et al., 1989)	MANOVA	Peers > Coach (M = 5.40 > 4.39*)	Peers > Coach (M = 5.38 > 5.20*)	Peers > Coach (M = 5.87 > 5.30*)	Differences between starters and non-starters were not assessed

(table continues)

ID	Author(s)	Assessment period	Coach Influence	Peer Influence	Parental Influence	Measures for BPN	Analysis	Autonomy	Competence	Relatedness	Limitation
17	Riley & Smith (2011)	Approximately 10 games in the current season	Coach-athlete relationships (+)	Friendship quality (+); peer acceptance (+)	N/A	Autonomy scale by Standage et al. (2003); Competence subscale of IMI (McAuley et al., 1989); NRS (Richer & Vallerand, 1998)	Multiple regression	Coach > Peers (coach-athlete relationship: b = .56*; friendship quality: b = −.29; peer acceptance: b = .44*)	Peers > Coach (coach-athlete relationship: b = .24*; friendship quality: b = .23*; peer acceptance: b = .31*)	Coach ~ Peers (coach-athlete relationship: b = .53*; friendship quality: b = .22; peer acceptance: b = .77*)	Selective attention to the social agents of the coach and peers
18	Sánchez-Oliva et al. (2012)	Unreported	Task-involving (+)	Task-involving (+)	Parental support (+)	EMM (García-Calvo et al., 2011)	SEM	Coach > Parents > Peers (r = .60* > .47* > .41*; β = .77* > .41* > −.10)	Parents > Coach > Peers (r = .45* > .35* > .18*; β = .51* > .50* > −.25*)	Coach > Peers > Parents (r = .54* > .52* > .36*; β = .41* > .32* > .09)	Only the positive social environments and need satisfaction were assessed
19	Taylor & Bruner (2012)	Unreported	Coach rapport (+)	Task cohesion (+)	N/A	Adapted BPNRS (La Guardia et al., 2000)	SEM	Coach > Peers (r = .44* > .31*; β = .46* > .26*)	Coach > Peers (r = .44* > .31*; β = .46* > .26*)	Coach > Peers (r = .44* > .31*; β = .46* > .26*)	Relationship in soccer does not represent experiences in family and school domains

Note. BNSSS = Basic Need Satisfaction in Sport Scale; BPN = basic psychological needs; BPNRS = Basic Psychological Need in Relationships Scale; BPNS = Basic Psychological Needs Scale; EMM = Escala de Mediadores Motivacionales; IMI = Intrinsic Motivation Inventory; NRS = Need for Relatedness Scale; SPPA = Self-Perception Profile for Adolescents. r = Pearson correlation coefficient; b = unstandardized regression coefficient; β = standardized regression/path coefficient; (+) = positive social factor; (−) = negative social factor. *p <. 05.

Table 3

Summary of Methods and Results in Qualitative Studies (N = 8)

ID	Author(s)	Assessment period	Coach Influence	Peer Influence	Parental Influence	Assessment for BPN	Analysis	Autonomy	Competence	Relatedness	Limitation
1	Almagro et al. (2015)	Unreported	A climate of autonomy support, self-improvement, and teamwork	Support, collaboration, or help from teammates	N/A	Semi-structured, open-ended questions	Deductive and inductive content analysis; frequency analysis	Coach plays an important role in autonomy support	Coach plays an important role in task design and motivational climate through feedback	Peers play an important role, both positive and negative influences	Each athlete completed one interview at different points of the season
6	Gledhill & Harwood (2015)	Unreported	Thwarting autonomy, competence, and relatedness	Negative social interactions	Emphasis on academics and discouragement toward sport participation	Semi-structured, open-ended questions	Grounded theory; negative case analysis	Negative role: Coach (e.g., told players not to attend games)	Negative role: Coach (e.g., told "low performers" that they could not develop through training or games any more	Negative role: Coach (e.g., asked players to remove themselves from the group) > Peers (e.g., "low performers" distanced from "high performers")	Reliance on player views about their parent interactions; Retrospective interviews were subject to recall error or bias
9	Keegan et al. (2009)	Unreported	Instructional and pedagogic considerations	Peer relationships, social interaction, altruistic behaviors, and collaboration	Parent support and facilitation; Parent play-and-teach behaviors	Semi-structured, open-ended questions	Inductive content analysis	Coach and Parents (collaborative vs. autocratic leadership styles) > Peers	Coach and Parents (positive vs. negative evaluations) > Peers	Peers (formation of friendships and group identity) > Coach and Parents	Impossible to establish the relative impact of social agents
10	Keegan et al. (2010)	Unreported	Instruction, selection, and management (collaboratively, positively, tolerantly)	Friendship, cooperation, and reinforcement of rules/values	Support and facilitation (unconditionally, positively, collaboratively)	Semi-structured, open-ended questions	Inductive content analysis; constant comparison; critical reflection	Coach and Parents (autonomy supportive vs. controlling styles)	Peers (discriminatory vs. inclusive style, conflictive vs. positive rivalries); Parents (play-and-teach behaviors)	Peers (peer relationships and social interactions)	Complex interplay between autonomy, competence, and relatedness, could not be examined

(table continues)

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ID	Author(s)	Assessment period	Coach Influence	Peer Influence	Parental Influence	Assessment for BPN	Analysis	Autonomy	Competence	Relatedness	Limitation
11	Keegan et al. (2014)	Unreported	Instruction, leadership, and coach-athlete relationships	Emotional support, collaborative/ competitive behaviors, and peer relationships	Emotional and moral support; diminished role	Semi-structured, open-ended questions	Inductive content analysis; constant comparison; critical reflection	Coach (autonomy supportive vs. controlling styles)	Peers (social recognition and status)	Coach (relatedness and team support); Peers (friendship and affiliation, group membership and belonging)	Mostly white male participants; Focus groups might have led to social desirability, preventing criticism of social agents;
12	Kimball (2007)	Unreported	Coach-athlete relationships and control	Peer relationships	N/A	Semi-structured, open-ended questions	Inductive content analysis	Peers > Coach ("Teammates are more influential in altering individuals' behaviors than are their coaches")	N/A	N/A	Demographic factors that might affect perceived autonomy were not examined
15	Raabe & Readdy (2016)	Three time points: the beginning, middle, and end of the fall semester	Positive competence feedback and offer for choices and input	Positive competence feedback and peer relationships	N/A	Semi-structured, open-ended questions; field notes; observations	Deductive and inductive content analysis; frequency analysis	Coach > Peers ("the coaching staff gave more choice and opportunities for input to cheerleaders who had been on the team the previous year")	Coach ~ Peers ("cheerleaders obtained their competence feedback from a multitude of situational sources, including comments from teammates, coaches")	Peers > Coach ("cheer squad as their main peer group. This allowed for a good working relationship")	A majority of the participants were 1st-year collegiate athletes
20	Williams et al. (2013)	Unreported	Relationships with coaches	Meaningful relationships within sport	Parental support	Semi-structured, open-ended questions	Inductive content analysis; frequency analysis	N/A	N/A	Parents (especially mothers) > Coach > Peers	Participants were interviewed at various stages of their golf experience (various level of active golfers; different dropout age of inactive golfers

Note. BPN = basic psychological needs; N/A = Not applicable, due to the research emphasis on only one psychological need.

Data Analysis and Study Findings

Quantitative Studies

Of the 12 studies using quantitative analysis, 7 employed structure equational modeling (SEM) techniques (including path analysis), 3 employed multiple regressions, one employed correlation analyses, and one employed multivariate analysis of variance to investigate the relations between social environments and psychological need satisfaction. All studies found significant associations (positive or negative) between most social environments and satisfaction of autonomy, competence, and relatedness, except between (a) autonomy and, controlling behavior of coaches (Kipp & Weiss, 2013, 2015), friendship quality (Kipp & Weiss, 2015; Riley & Smith, 2011), and peer-created performance climate (Kipp & Weiss, 2015), (b) competence and, autonomy support from coaches (Kipp & Weiss, 2013, 2015), controlling behavior of coaches (Blanchard et al., 2009; Hodge & Gucciardi, 2015; Kipp & Weiss, 2013, 2015), controlling behavior of peers (Hodge & Gucciardi, 2015), friendship quality, peer-created mastery climate (Kipp & Weiss, 2015), peer-created performance climate (Kipp & Weiss, 2013, 2015), autonomy support from parents, and parental involvement (Gagné et al., 2003), and (c) relatedness and, controlling behavior of coaches (Blanchard et al., 2009; Kipp & Weiss, 2013, 2015) and friendship quality (Riley & Smith, 2011). Thus, most of the nonsignificant associations were between negative social environments and need satisfaction. Competence also had the largest number of nonsignificant associations among the three psychological needs.

When predicting need satisfaction from social environments, the SEM and regression analyses largely showed similar results to the abovementioned associations (see Table 2). Fraina (2017) was the only one who studied interactive effects of the social environments, and found that relatedness, but not autonomy and competence, from coaches and from peers produced

interactive effects over and above independent (i.e., main) effects in predicting relatedness satisfaction. Only one study compared group differences in the influence of social agents: Raabe and Zakrajsek (2017) indicated coaches had more positive influence in all three need satisfaction for coactive sports than interactive sports,[1] while peers had more positive influence in all relatedness satisfaction for interactive sports than coactive sports. Only Kipp and Weiss investigated the role of developmental stages in data analysis, in which physical maturity of female gymnasts negatively predicted competence in the cross-sectional study (2013) but not over time in the longitudinal study (2015). None of the seven studies using SEM examined group variables (e.g., gender, sport type) by performing invariance testing.

Qualitative Studies

In all eight studies, interviews were recorded and transcribed verbatim into single-spaced texts for researchers to read and reread before data analysis. All studies underwent a coding process for researchers to find meanings from the data; seven applied content analysis, while Gledhill and Harwood (2015) used a grounded theory approach (Strauss & Corbin, 1998) to conduct open coding, axial coding, and theoretical integration. In order to create categories and themes from the data, five studies used an inductive approach (Gledhill & Harwood, 2015; Keegan et al., 2009, 2010, 2014a; Kimball, 2007), one study used a deductive approach (Williams et al., 2013), and two studies used a combination of inductive and deductive approaches (Almagro et al., 2015; Raabe & Readdy, 2016). Inductive analysis uses interviewee quotes to create new themes and categories, whereas deductive analysis uses pre-determined

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[1]Coactive sports are the ones athletes compete individually while striving for a common goal (e.g., track and field, table tennis); interactive sports are the ones athletes have to work with one another directly during performance (e.g., soccer, volleyball).

themes and categories to organize the quotes. A combination of these techniques has been suggested as the most pragmatic way of conducting content analysis, because there are always underlying theory and assumptions in research (Patton, 2002). All studies except Kimball (2007) included more than one researcher in the analysis process to ensure consistency.

In addition to coding, several studies also employed other analysis strategies within content analysis. Specifically, Keegan and colleagues (2009, 2010, 2014a) implemented constant comparison (Glaser & Strauss, 1967; Lincoln & Guba, 1985) and critical reflection/questioning (Côté, Salmela, Baria, & Russel, 1993), and three studies implemented frequency analysis (Almagro et al., 2015; Raabe & Readdy, 2016; Williams et al., 2013). Worthy of note is that frequency analysis in qualitative research provides a guidance on the general instead of definite importance of categories and codes (Maxwell, 2010). Moreover, four studies used a qualitative software—MAXQDA (Almagro et al., 2015) and NVivo (Keegan et al., 2009, 2010, 2014a)—to perform content analysis. All qualitative studies reported the meaning units and themes/categories in relation to social environments created by different social agents (i.e., coaches, parents, and peers) and corresponding satisfaction or frustration of psychological needs. Several studies organized the results specific to each social agent with quotes, which provided more detailed information about the respective motivational influence (Gledhill & Harwood, 2015; Keegan et al., 2009, 2010, 2014a; Williams et al., 2013). Each study presented different findings and categories based on the specific research purposes and interview questions, and thus cannot be quantified. But in general, these three social agents differentially contribute to social environments: (a) coaches plays an important (positive or negative) role in autonomy support/control, instruction and feedback, management, leadership, relationships with athletes; (b) peers influence mostly the relatedness dimension of basic psychological needs (satisfaction or

frustration), such as friendship, social interactions, cooperation/collaboration, and feedback; and (c) parents serves the role of support and facilitation as well as discouragement and pressure. All studies included some type of peer debrief and/or member check to enhance the trustworthiness of the findings.

After data analysis, Kimball (2007) compared the profiles of the participants by gender, race, sport, and year in school to examine similarities and differences, while Williams et al. (2013) compared the data from two groups of female golfers (active or inactive) to compare differences in their relatedness support and associated involvement in sport. On the other hand, Gledhill and Harwood (2015) built a model using diagrams and completed a post-theoretical literature review (Strauss & Corbin, 1998) based on their findings.

Relative Influence of Social Agents

Quantitative Studies

The quantitative findings provided empirical evidence to compare relative influence of social agents in satisfaction of athletes' psychology needs. First, studies in this review universally showed a greater impact of coaches than peers and parents on autonomy satisfaction, except for Raabe and Zakrajsek's study (2017) examining collegiate athletes using a different analysis strategy (MANOVA) than other studies. The two studies that investigated social environments created by all three social agents revealed a greater influence of parents than peers in athletes' autonomy satisfaction. In other words, peers contributed the least as a social agent to autonomy satisfaction. Second, there was mixed evidence regarding the role of social agents in competence satisfaction. Over half of the study findings supported peers as the most influential agent in creating social environments such as friendship quality and motivational climates (Kipp

& Weiss, 2013, 2015; Riley & Smith, 2011). In contrast to the assumptions of AGT, peer-created task-involving climate was a negative predictor (Sánchez-Oliva et al., 2012) and ego-involving climate was a positive predictor (Kipp & Weiss, 2015) of competence. Two studies (Gagné et al., 2003; Khalaf, 2014) showed a greater influence of coaches than parents when studying the same SDT-based social factors (i.e., autonomy support, involvement, and structure), whereas Sánchez-Oliva and colleagues (2012) indicated a greater influence of parents than coaches when comparing parental support with coach-created task-involving climate as predictors. Third, the majority of the studies suggested that peers playing the most critical role in relatedness satisfaction, followed by coaches and parents. Nevertheless, two studies revealed that coaches could have a stronger influence than peers when measuring non-SDT-based social factors, such as comparing coach rapport with task cohesion (Taylor & Bruner, 2012) and coach-created with peer-created task-involving climate (Sánchez-Oliva et al., 2012). While three studies showed a stronger influence of coaches than parents on relatedness based on need support and motivational climate, one study showed the opposite relative influence when investigating social support from and conflict with coaches and parents, respectively (Felton & Jowett, 2013).

Qualitative Studies

Although the results of qualitative studies could not be quantified for comparing the relative influence of social agents, synthesis of the findings suggested that coach played the most important role in autonomy satisfaction and frustration. Styles of coaching and parenting (autonomy supportive vs. controlling) were the most frequently mentioned categories that influenced perceived autonomy. Kimball (2007) found that collegiate athletes might perceived a larger influence from teammates than coaches as "teammates are more influential in altering

individuals' behaviors than are their coaches" (p. 833). With regard to competence, all three social agents seemed to be similarly influential, but in different aspects. In changing how athletes perceived competence, coaches might play a more important role in designing tasks and giving feedback (Almagro et al., 2015; Keegan et al., 2009); peers might be more influential in social interactions, recognition, and status (Keegan et al., 2010, 2014a); and parents might play a more critical role in emotional support and evaluations of athletes (Keegan et al., 2009, 2014a). For example, "cheerleaders obtained their competence feedback from a multitude of situational sources, including comments from teammates, coaches" (Raabe & Readdy, 2016, p. 83). Concerning relatedness, research consistently demonstrated the most influential role of peers in terms of positive and negative relationships. While friendship and group identity are important contributors to relatedness, coach-athlete relationships and team support from coaches were also deemed vital (Keegan et al., 2009, 2014a). Moreover, parental support was crucial in promoting relatedness. Support from mother was indeed more influential than support from coach or peers in supporting relatedness of active and inactive female golfers (Williams et al., 2013).

Discussion

The main purpose of this systematic review was to summarize research evidence of the roles of social agents in satisfaction and frustration of basic psychological needs among athletes, as well as provide practical implications and suggestions for future research. A total of 20 studies were reviewed, including both quantitative and qualitative research, especially since qualitative methods were deemed important to extend sport motivation research (Clancy, Herring, MacIntyre, & Campbell, 2016). The results of this systematic review suggest that coaches, peers, and parents serve different roles as social agents in supporting and/or thwarting basic

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psychological needs of athletes, which lead to different degrees of satisfaction and frustration of basic psychological needs.

Interpretation of Study Findings

As expected, most of the studies sampled children and adolescents, because the influence of parents in psychosocial development of athletes typically retain until adolescence—a developmental stage that peers (teammates) become more salient (Keegan et al., 2014b). Consistent with SDT and AGT, quantitative findings indicated that the positive social environments created by coaches, peers, and parents, respectively, were all positively associated with greater satisfaction of autonomy, competence, and/or relatedness in athletes. However, there were nonsignificant associations mostly between social environments and competence, maybe because most of the positive social factors studied pertained to autonomy support from and relationships with social agents. While in sport contexts, positive feedback and optimal challenge seemed to be more closely related to competence satisfaction (Ryan & Deci, 2017). On the other hand, the negative social environments (e.g., controlling behavior) created by these social agents were not all significantly associated with satisfaction of psychological needs (Blanchard et al., 2009; Kipp & Weiss, 2013, 2015). This finding is in line with the "darker side" of SDT that need-thwarting contexts (i.e., negative social environments) contribute more directly to need frustration and ill-being rather than to need satisfaction and well-being (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Vansteenkiste & Ryan, 2013).

Consistent with the literature (Keegan et al., 2014b; Vazou, Ntoumanis, & Duda, 2005), this review shows that both coaches and peers are important social agents in shaping the social environments in sports, which in turn exhibit positive and negative influences in psychological

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needs and motivational outcomes. Most of the participants were older adolescents and young adults who were in the specialization and/or the investment-mastery stages of athletic career, so parental influence was relatively less critical and peer influence became more crucial in psychological need satisfaction of athletes (Keegan et al., 2014b; Weigand, Carr, Petherick, & Taylor, 2001). Both quantitative and qualitative research evidence revealed that coaches were particularly influential in supporting and thwarting autonomy; peers were relatively important in supporting competence and relatedness; and parents contribute more to supporting autonomy than competence and relatedness, though to a lesser extent than coaches and peers.

Although most study findings were consistent with SDT, a few issues concerning research design and data analysis, as well as research gaps, were identified for future research. First, the majority of the studies in this research line used a cross-sectional design, with only one quantitative and one qualitative longitudinal study. More experimental and longitudinal research is needed to examine the causal relationships between social environments and psychological needs. Researchers should also consider using mixed-methods design to overcome the respective weaknesses of quantitative and qualitative methods, promote data triangulation, enhance completeness of the findings, facilitate appropriate sampling, and increase generalizability of the research (Sparkes, 2015). While only one qualitative study mentioned analyzing field notes from observation in addition to interview responses, future qualitative and mixed-method research may incorporate specific observation tools of social environments, such as the Multidimensional Motivational Climate Observation System (MMCOS; Smith et al., 2015), the Behavior Evaluation Strategies and Taxonomies (BEST; Sharpe & Koperwas, 1999), and Parent Observation Instrument for Sport Events (POISE; Kidman, McKenzie, & McKenzie, 1999) to enhance objectivity and trustworthiness of the findings.

In regard to participants, only one study recruited athletes from a non-White/Caucasian dominant country (Khalaf, 2014). Future studies should examine athletes of different races/ethnicities and from different countries, especially in continents beyond North America and Europe, to deepen the understanding of the social environments and psychological need in sports across cultures. Although most of the studies sampled athletes of both genders, various age groups, and different sport contexts, no comparisons were made across groups regarding the relative influence of social agents in basic psychological needs. Therefore, future research should examine whether the roles of social agents vary across groups, including gender, sport type, and competitive level, using multigroup and/or multilevel SEM for quantitative studies, and frequency analysis of interview responses and/or observations for qualitative studies. In addition, both quantitative and qualitative studies should recruit coaches and peers as participants in order to obtain a comprehensive view of social environments from different perspectives.

With respect to data collection, the assessment period should be specified in future studies in order for researchers and practitioners to gain insights into whether the relations between social environments and psychological needs differ across pre-season, in-season, and off-season. Research on adolescent (Reinboth & Duda, 2006) and young adult (Cheval, Chalabaev, Quested, Courvoisier, & Sarrazin, 2017) athletes indicated that the social environments tended to be more positive and psychological need satisfaction generally increased over the course of a season, and that the associations between the two constructs were stronger later than earlier in the season. While autonomy support and controlling behaviors were the most studied social factors with consistent evidence, examining other positive and negative social environments based on SDT and AGT is needed. Duda (2013) integrated SDT and AGT to conceptualize two types of coach-created motivational climates empowering and disempowering,

which have been shown to predict satisfaction and frustration of psychological needs, respectively (Appleton, Ntoumanis, Quested, Viladrich, & Duda, 2016; N. Smith et al., 2015). However, no studies to date have investigated coach-created motivational climate with other social environments created by peers or parents. Further, there is little empirical evidence of relations between peer-created motivational climate and psychological needs (e.g., Kipp & Weiss, 2015), which warranted further attention in future studies. Parental influence in psychological need satisfaction and frustration received the least attention in the literature. Thus, future research should explore various parent-created positive and negative environments such as parental involvement and pressure that are critical in youth sport participation (Bremer, 2012; Holt, Tamminen, Black, Sehn, & Wall, 2008).

Since Weigand and colleagues' (2001) call for more studies on relative influence of coaches, peers, and parents in sports, surprisingly, there have been only two quantitative studies doing so in relation to psychological needs (Khalaf, 2014; Sánchez-Oliva et al., 2012). The limited quantitative investigations may be attributed to the unique statistical and practical challenges in collecting and analyzing quantitative data concerning multiple sources of social environments. Future quantitative studies are encouraged to apply advanced SEM techniques such as invariance testing and latent growth modeling to study different social environments and psychological needs simultaneously. On the contrary, it is relatively common for qualitative studies to include findings and discussions regarding social environments created by all three social agents. Future qualitative investigations should further extend the current knowledge by comparing various groups of athletes (e.g., males vs. females, varsity vs. non-varsity, starter vs. non-starters, autonomously motivated vs. amotivated) within a study.

Practical Implications

The International Olympic Committee states that positive psychological experiences and competencies should be the central components of youth sport participation (Bergeron et al., 2015). These components include creating positive social environments that maximize satisfaction and minimize frustration of basic psychological needs in athletes. This review shows that educational programs and strategies are needed for coaches, parents, and administrators to facilitative more positive sport participations of children and adolescents.

Due to their critical role in autonomy and competence satisfaction of athletes, coaches are encouraged to adopt the empowering coaching framework (Duda, 2013) in their coaching behavior, which focuses on five aspects: (a) promotes task involvement such as offering encouragement to make athletes feel successful when they improve; (b) increases autonomy support such as providing meaning choices and rationales for athletes to learn skills and strategies; (c) demonstrates social support such as appreciating and caring for athletes as people; (d) reduces behaviors that lead to ego involvement such as only praising athletes who perform well during practice and competition; and (e) avoids controlling behavior such as threatening to punish athletes to keep them on task during practice.

Peers (i.e., teammates) are a particularly important social agent in promoting competence and relatedness satisfaction of athletes. Depending on the age of the athletes, coaches and sport program coordinators can independently or work with sport team leaders (e.g., captains who are adolescents or young adults) to facilitate positive peer-created social environments, such as a task-involving motivational climate, by emphasizing five types of athlete behaviors (Ntoumanis & Vazou, 2005): (a) encourages improvement such as offering to help teammates develop new skills; (b) offers social support such as caring about every teammate's feeling and opinions; (c)

promotes effort such as praising teammates for their effort even in unsuccessful performance; (d) minimizes the demonstration of intra-team competition such as trying to outperform teammates; and (e) avoids intra-team conflict such as negative comments or jokes that put teammates down.

"Before we place all the responsibility for athletes' sport motivation on the coaches, we should consider that every young athlete typically faces another motivational climate at home" (Ryan & Deci, 2017, p. 494). Although parents do not seem to have as much influence as coaches and peers do based on the review findings, they deserve attention in youth sport as they are the most significant social agent that influences the development of children and adolescents (Grolnick, 2009). On the one hand, parents can engage in active involvement and support by asking and listening to the athlete's feeling before, during, and after practice/competition, encouraging them to express any worries and problems in sports, and volunteering for the athlete's sport team or at his/her competition. On the other hand, parents should avoid demonstrating directive behavior or pressure on the athlete by avoiding conversations about what the athlete should do to improve performance, how the athlete should practice and train harder, and why the athlete performs poorly in competition (Bremer, 2012).

Limitations

Although this review attempted to comprehensively investigate the roles of social agents in athletes' psychological need satisfaction and frustration, there are limitations that should be addressed for future research. First, only journal articles and dissertations with an English abstract were included, thus representing mostly a Western perspective dominated by English-speaking countries. This is a common concern for review papers due to much effort in literature search and translation in a different language. Second, this review only focused on the relations

between the social environments and psychological needs in sport contexts, which limited the literature being reviewed. Future reviews may focus on other common variables influenced by social agents in sports based on SDT and AGT, such as motivation, goal orientation, well-being, and burnout, as well as in other contexts, such as physical education and other forms of organized physical activities. Third, it was somewhat challenging to summarize the relative influence of social agents from qualitative studies, because there were no "significant" associations represented in the qualitative data. Researchers who wish to study more in-depth qualitative findings can implement qualitative analysis strategies such as content analysis (Elo & Kyngäs, 2008) to code the literature with themes and/or categories, paired with frequency analysis, for further interpretation. Despite these limitations, this review serves as the first attempt to summarize the growing body of literature on the relative influence of three social agents in predicting athletes' psychological need satisfaction and frustration in sport contexts. It also identifies important research gaps and elicits future research areas with a focus on the "darker side" of sport participation.

Conclusion

In conclusion, this systematic review shows that coaches, peers, and parents have unique roles in satisfaction and frustration of psychological needs of athletes. More research studying concurrent or interactive social environments created by these social agents, both intrapersonal and interpersonal, will further the understanding of what variables support or thwart autonomy, competence, and relatedness more than the other ones. It is recommended that youth sport programs to be supported with a coach-created empowering climate, a peer-created task-

involving climate, and positive parental involvement to enhance satisfaction of athletes'

autonomy, competence, and relatedness.

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THE ROLES OF COACHES, PEERS, AND PARENTS IN HIGH SCHOOL ATHLETES'

MOTIVATIONAL PROCESSES: A MIXED-METHODS STUDY

Abstract

Grounded in self-determination theory and achievement goal theory, the purpose of this mixed-methods study was to examine the underlying motivational processes from social environments created by coaches, peers, and parents to motivational outcomes in high school athletes, with an emphasis on the relative influence of social agents in basic psychological needs (i.e., autonomy, competence, and relatedness). The quantitative part of this study tested a hierarchical model of high school sport motivation in a final sample of 311 student athletes (204 boys, 107 girls) using structural equation modeling: social factors (coach-, peer-, and parent-created motivational climate) **à** psychological mediators (need satisfaction and need frustration) **à** types of motivation (autonomous motivation, controlled motivation, and amotivation) **à** consequences (subjective vitality, athlete burnout, and intention to drop out). Invariance across gender and across team type (varsity vs. non-varsity) was also tested. Good model fits were achieved in separate "brighter side" and "darker side" models across the overall sample, gender, and team type. The follow-up qualitative part of this study explored "how" beyond "what" coaches, peers, and parents contribute to the social environments, need frustration, and negative motivational outcomes in sport in a subsample of 37 student athletes (24 boys, 13 girls) who reported high amotivation/burnout and higher than average dropout intentions in the quantitative survey. Content analysis and observation were conducted to interpret the focus group interview data among athletes across gender and team type. The results of both quantitative and qualitative parts were integrated to summarize the roles of coaches, peers, and parents in the "brighter and darker sides" of athletic experience in high school athletes.

Introduction

The 2016–2017 National Federation of State High School Association's recent annual survey (2017) showed an increase from approximately six to eight million in the number of high school student athletes in the past two decades. With approximately 70% of high school students playing on at least one sport team within an academic year (Drake et al., 2015), sport experience has significant impacts on the psychosocial development of most high school students. Specifically, compared to students who do not participate in sports, high school sport participants reported greater positive developmental outcomes such as higher emotional regulation, self-esteem, and educational attainment (Hansen, Larson, & Dworkin, 2003; Larson, Hansen, & Moneta, 2006; Marsh & Kleitman, 2003). Within the same studies, however, high school sport participation was also associated with certain negative developmental outcomes such as negative peer interactions and stress. Further, there is ample evidence on the increased rates of athlete burnout and dropout during adolescent years (Cresswell & Eklund, 2006; Harris & Watson, 2014; Sabo & Veliz, 2016). It is crucial, therefore, to investigate the social environments and the corresponding motivational processes that lead to maladaptive outcomes in high school athletes.

Self-Determination Theory

Self-determination theory (SDT; Deci & Ryan, 1985, 2000; Ryan & Deci, 2017) is a well-established theoretical framework that examines the positive and negative motivational outcomes of adolescent athletes by considering the social environments and motivation in sport (Appleton & Duda, 2016; Taylor & Bruner, 2012). According to SDT, motivation exists on a continuum, ranging from *intrinsic motivation* to *extrinsic motivation* to *amotivation* (Deci & Ryan, 1985). When doing an activity, intrinsic motivation is characterized by obtaining interest

and enjoyment as the "reward", whereas extrinsic motivation is characterized by achieving separable outcomes. Extrinsic motivation exists in different forms of regulation, varying from high to low the degrees of internalization (Vansteenkiste & Ryan, 2013)—the process of recognizing and genuinely accepting responsibility in the absence of intrinsic motivation—when performing a behavior: (a) *integrated regulation* is represented by values and beliefs that are congruent with oneself (highest degree of internalization); (b) *identified regulation* is represented by acceptance of certain values; (c) *introjected regulation* is experienced as "internal control" including feelings of guilt, shame, and disapproval; and (d) *external regulation* is experienced as "external control" such as monetary reward, social status, and avoidance of punishment (lowest degree of internalization).

Motivational regulations were further defined as *autonomous motivation* (i.e., intrinsic motivation, integrated regulation, and identified regulation) and *controlled motivation* (i.e., introjected and external regulations). In a given social context, autonomous motivation is associated with adaptive responses such as positive youth development and persistence in sport (Inoue, Wegner, Jordan, & Funk, 2015; Jõesaar et al., 2011), whereas controlled motivation is associated with maladaptive motivational responses such as stress and burnout in sport (Li, Wang, Pyun, & Kee, 2013; Lonsdale, Hodge, & Rose, 2009). In addition to intrinsic and extrinsic motivation, *amotivation* exists as a distinct type of motivation defined by a lack of intention for behavioral engagement. Due to an absence of intentionality, amotivation tends to be related to the most maladaptive consequences such as dropout from sport and ill-being (Balish et al., 2014; Cresswell & Eklund, 2005).

Beyond motivation, SDT addresses three basic psychological needs—*autonomy*, *competence*, and *relatedness*—as essential elements of optimal functioning and well-being (Ryan

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& Deci, 2000b). *Autonomy* refers to the experience of volition and having control; *competence* refers to a sense of effectiveness and mastery; and *relatedness* refers to a sense of belonging and connection with others (Deci & Ryan, 2000b). These psychological needs are high correlates of sport motivation and dropout (Balish et al., 2014), so they can explain individual differences in motivational outcomes in sport participation. While satisfaction of basic psychological needs is essential to maintain physical and psychosocial well-being, frustration of these psychological needs leads to maladaptive functioning and ill-being (Vansteenkiste & Ryan, 2013). Within sport contexts, previous quantitative studies have examined the "brighter side" (i.e., need support and need satisfaction) extensively (Quested et al., 2013), whereas researchers have only begun to study the "darker side" (i.e., need thwarting and need frustration) since the first study conducted by Bartholomew and colleagues (2011), indicating a significant research gap in the sport setting. Need satisfaction tends to lead to greater autonomous motivation and well-being, whereas need frustration tends to result in greater controlled motivation, amotivation, and ill-being (Deci & Ryan, 2000b).

Social Agents and Social Environments

Another key tenet of SDT relates to the environment within a social context, which is a primary factor that affects motivational processes and behavioral outcomes. Vallerand (1997) proposed a hierarchical model of intrinsic and extrinsic motivation (HMIEM) to study the motivational sequence of "social factors, psychological mediators, types of motivation, [and] consequences." Within the context of youth sports, coaches, peers, and parents are three significant social agents that influence the social environments (i.e., social factors) and motivational responses of athletes (Keegan et al., 2009, 2010). In a systematic review of youth

sport dropout with 8,345 participants, Balish and colleagues (2014) suggested future research is

needed to investigate specific social agents that influence athletes' participation in and dropout

from sport. Thus, exploring the interactive social environments created by coaches, peers, and

parents will help us understand how they contribute to need satisfaction and need frustration,

motivational regulations, and consequences such as burnout and dropout intentions of athletes.

Specifically, this study aimed to examine coach-, peer-, and parent-created motivational

climates, as well as parental involvement in high school sport contexts.

Coach-Created Motivational Climate

The term motivational climate was originally defined in achievement goal theory (AGT;

Nicholls, 1989) as the perception of social environment created by significant others in a social

context. AGT proposed two types of motivational climates: a task-involving climate that

emphasizes effort, skill development, and cooperation, and an ego-involving climate that focuses

on competition and social comparisons (Ames, 1992). Recent research has integrated SDT and

AGT in conceptualizing a coach-created motivational climate (Appleton et al., 2016; Duda,

2013; N. Smith et al., 2015). Specifically, Duda (2013) proposed that a coach-created

motivational climate is multidimensional in nature, consisting of *empowering* and

disempowering climates. An empowering climate is an environment signified by autonomy

support and social support from coaches in a task-involving climate, whereas a disempowering

climate is an environment characterized by controlling coaching in an ego-involving climate.

Based on SDT, autonomy support and social support from coaches satisfy athletes' autonomy

and relatedness needs (e.g., Reinboth, Duda, & Ntoumanis, 2004), while controlling behavior of

coaches frustrates athletes' psychological needs through pressure, coercion, and intimidation

(e.g., Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010). Accordingly, athletes reported greater autonomous motivation in an empowering climate, but greater controlled motivation and amotivation in a disempowering climate (N. Smith et al., 2016). Moreover, an empowering climate is positively related to sport enjoyment (Fenton, Duda, Appleton, & Barrett, 2017) and self-efficacy (Zourbanos et al., 2016), and a disempowering climate is positively related to sport burnout and ill-being (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Cheval et al., 2017). Although Duda (2013) suggested a positive association between an empowering climate and need satisfaction, and between a disempowering climate and need frustration, empirical studies have yet to examine these relationships due to this relatively new research line.

Peer-Created Motivational Climate

Peers, teammates in particular, are an important part of the social environment in youth sports. Yet, relatively few studies have investigated a peer-created motivational climate as compared to a coach-created motivational climate (Jõesaar et al., 2011). Similar to the dimensions of a coach-created motivational climate, Ntoumanis and Vazou (2005) proposed the construct of a peer-created motivational climate, consisting of *task-involving* and *ego-involving* climates. While a task-involving climate is signified by improvement, effort, and relatedness support, an ego-involving climate is characterized by intra-team competition/ ability and intra-team conflict (Ntoumanis & Vazou, 2005). Therefore, a task-involving climate positively, and an ego-involving climate negatively, predicted intrinsic motivation through need satisfaction (Jõesaar et al., 2011). Yet, little is known about the role of peer-created motivational climates in negative motivational processes such as predicting need frustration, amotivation, and burnout in youth sport. A review of motivational climates in sport showed that only five studies had

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investigated a peer-created motivational climate (Harwood et al., 2015), and thus further

examination is warranted to fill the research gap. Another review of sport motivation research

suggested that more comprehensive understanding of a peer-created motivational climate on

various motivational regulations is needed (Clancy et al., 2016).

Parent-Created Motivational Climate

A parent-created motivational climate in sport affects how children and adolescents

behave and perform in sport participation (White, 1996). Similar to a peer-created motivational

climate, a parent-created motivational climate consists of *task-involving* and *ego-involving*

climates. A task-involving climate created by parents is signified by learning, enjoyment, and

making mistakes as a part of the learning process, whereas an ego-involving climate created by

parents is characterized by worries about failures and achieving success without putting forth

effort (White, Duda, & Hart, 1992). A parent-created task-involving climate has been shown to

positively predict competence, enjoyment, and intention to continue participation in sport

through task-orientation (Atkins, Johnson, Force, & Petrie, 2014). Yet, no research has yet to

examine the role of a parent-created motivational climate in basic psychological needs,

especially the frustration of autonomy, competence, and relatedness, and motivational

regulations in youth sport. Harwood and colleagues' (2015) review of motivational climates in

sport indicated only three studies measuring parent-created motivational climate. Because

parents are a fundamental social agent that contribute to youth athletes' physical and

psychosocial development (Jowett & Timson-Katchis, 2005), further evidence of parent-created

motivational climates is needed to enhance youth development through sport participation.

Parental Involvement

Due to the growth in youth sport participation, more parents contribute a significant amount of family time, financial resources, and emotional support to children and adolescents in sports (Coakley, 2006). These different types of parental involvement can be considered as social environments in sports. Hellstedt (1987) proposed a continuum in the amount of parental involvement, ranging from *underinvolved* to *overinvolved*. Underinvolved parents may not provide sufficient instrumental and emotional support to athletes in sport participation, whereas overinvolved parents may impose pressure on athletes by coaching and setting unrealistic goals for them. On the other hand, moderately involved parents can provide support and direction to athletes, while offering choices and minimizing pressure (Hellstedt, 1987). As one of the first empirical studies examining parental involvement in sport, Lee and MacLean (1997) indicated that parental praise and active involvement as main sources of parental support and directive behavior as a main source of parental pressure in competitive swimmers aged 10–15 years.

Parental involvement has been shown to relate to SDT constructs. Drawing from qualitative interviews with youth athletes and their parents, Holt and colleagues (Holt et al., 2008) described a highly-involved parenting style with structure but little control as autonomy-supportive. According to Fredricks and Eccles's model of parental influence (2004), parents affect youth athletes' motivation by delivering messages about their competence and the value of sports, and/or by providing emotional and financial support. Taken together, previous studies have suggested that parental support (i.e., praise and active involvement) and parental pressure (i.e., directive behavior) would be positively related to satisfaction and frustration of psychological needs, respectively. Nevertheless, empirical evidence regarding these relationships has not been well established due to limited research and inconsistent measures of parental

involvement in sports (Bremer, 2012; Harwood et al., 2015). Few studies have investigated parental involvement among children and early adolescents in individual sports, while even less is known about the role of parental involvement among older adolescents and in team sports (Bremer, 2012).

Building on the extant literature, this study attempted to fill the research gap and better understand parental influence in youth sports by addressing all three recommendations in Bremer's (2012) review: (a) use of theoretical frameworks (i.e., SDT and AGT) to guide research questions and design; (b) recruitment of high school athletes from both individual sports and team sports; and (c) use of a mixed-methods research design that provides a richer picture of parental influence in terms of motivational climate and involvement.

Interaction of Social Agents

The social environments created by coaches, peers, and parents should be examined together for a comprehensive understanding of their influence in the motivational responses of athletes. This notion is fully supported by Harwood and colleagues' review of motivational climate (2015):

Athletes may experience the motivational 'pull and push' from the varying social agents who, together, contribute to an overall motivational climate. Therefore, examining the interactive effects of different social agents would advance knowledge on how sensitive athletes may be to specific aspects of the motivational climate. Such investigation is important where social agents promote conflicting messages: a common situation yet one where the current literature would not be able to predict what outcomes to expect. (p. 20)

Harwood and colleagues (2015) further revealed that only four quantitative studies

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examined a combination of motivational climate from two social agents, but no studies examined all three social agents. After performing a more extensive literature search, worthy of note is that two quantitative studies did investigate the roles of all three social agents in basic psychological needs. One study was from a journal article published in Spanish that examined the influence of coach-created task-involving climate, peer-created task-involving climate, and parental support in sport involvement in youth basketball (Sánchez-Oliva et al., 2012). The other study was from a published dissertation that studied the influence of autonomy support, involvement, and structure from the three social agents in motivation and training behaviors of Egyptian female track and field athletes (Khalaf, 2014). These two studies were consistent in that coaches were the most important agent in facilitating autonomy, peers were the least important agent in influencing autonomy and competence, and parents were the least important agent in fostering relatedness. Meanwhile, more qualitative studies began to examine the interaction of all three social agents in youth sport, indicating that peers have more influence and parents have less influence across the adolescent developmental period (Keegan et al., 2014b). In order to investigate the influence of the three social agents more comprehensively, this study aimed to examine the corresponding social environments concerning both the "brighter side" and "darker side" of the HMIEM in high school athletes using a mixed-methods research design, including quantitative surveys and qualitative interviews.

Psychosocial Outcomes in Sport

It is evident that many positive and negative psychosocial outcomes are related to sport participation and motivation, such as well-being and ill-being. There are two major views of well-being (Ryan & Deci, 2001): (a) a *hedonic* approach "focuses on happiness and defines well-

being in terms of pleasure attainment and pain avoidance"; and (b) an *eudaimonic* approach "focuses on meaning and self-realization and defines well-being in terms of the degree to which a person is fully functioning." The eudaimonic approach emphasizes psychological well-being over subjective well-being, and is adopted by SDT. SDT-based research often studies subjective vitality—a positive feeling of available energy to the self—as an indicator of eudaimonic well-being (Ryan & Frederick, 1997) that results from satisfaction of autonomy, competence, and relatedness (Ryan & Deci, 2001). Further, subjective vitality is related to physical health (Ryan & Frederick, 1997). Thus, understanding how sport motivation relates to athletes' subjective vitality can provide insights into how sport participation affects their physical and psychological well-being.

Motivational regulations are proximal antecedents of subjective vitality. For instance, an experimental study showed that autonomous motivation positively, and controlled motivation negatively, predicted subjective vitality (Nix, Ryan, Manly, & Deci, 1999). In addition, autonomous motivation partially mediated the positive relationship between need satisfaction and subjective vitality across the contexts of family, friends, romantic relationships, school, work, and leisure activities (Milyavskaya & Koestner, 2011). However, this relationship in sport contexts is not so clear due to few related studies (Alvarez et al., 2012). Therefore, more empirical evidence is needed as to how autonomous motivation, controlled motivation, and amotivation predict subjective vitality in sport.

Negative social environments and need frustration can lead to ill-being in sport (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011). Because athlete burnout and dropout increase with adolescents' age, it is important to investigate these negative psychosocial outcomes and reduce them in high school athletes (Harris & Watson, 2014). Burnout in sport is

multidimensional, defined as a psychophysiological and dysfunctional condition that includes physical and emotional exhaustion, reduced sense of accomplishment, and devaluation of sport (Raedeke, 1997). Previous studies have established a strong predictive utility of SDT constructs in burnout and corresponding interventions (Harris & Watson, 2014; Isoard-Gautheur & Guillet-Descas, 2012; Langan, Blake, Toner, & Lonsdale, 2015; Lonsdale et al., 2009). A meta-analysis on the associations of burnout with basic psychological needs and motivation indicated that motivational regulations and basic psychological needs are antecedents of burnout in sport (Li et al., 2013). Controlled motivation and amotivation are positively, and autonomous motivation is negatively, associated with burnout; the association between amotivation and burnout is the strongest (Harris & Watson, 2014; Li et al., 2013). Yet, related literature only focused on need satisfaction (negatively associated with burnout) without any investigation of need frustration.

Sport dropout is one of the negative motivational outcomes resulting from ill-being in youth sport participation. In the U.S., the average attrition rate between 8th and 12th grades was approximately 32%, with greater prevalence in girls than boys (Sabo & Veliz, 2016). Therefore, attention should be paid to the antecedents of sport dropout. Various theoretical models suggest that increased risk of sport dropout is closely related to burnout (Gustafsson, Kenttä, & Hassmén, 2011) and SDT variables. Previous studies have shown consistent positive association between amotivation and dropout, and negative association between autonomous motivation and dropout (Balish et al., 2014; Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002; Vallerand, 1997). Balish and colleagues' review (2014) of 23 articles showed that youth sport dropout was negatively associated with satisfaction of three psychological needs and coach/peer-created task-involving climate. Another systematic review of 43 articles further suggested sport competence and enjoyment as two most dominant protective factors for youth sport dropout, while pressures

from coaches, peers, and parents were prominent risk constraint factors (Crane & Temple, 2015).

Similar to sport burnout, sport dropout studies have yet to examine the role of need frustration.

Additionally, Crane and Temple (2015) called for more mixed-methods research on sport

dropout. Therefore, this study aimed to fill the research gaps by examining how need frustration

and negative social environments may contribute to burnout and dropout using mixed methods

based on SDT and HMIEM. Specifically, this study attempted to assess the intention to drop out,

as dropout intention is a relatively consistent predictor of the actual dropout behavior in various

contexts (Ajzen & Driver, 1992; Sarrazin et al., 2002; Vallerand et al., 1997). Measuring

intention to drop out is particularly helpful due to the cross-sectional nature of the current study.

Roles of Gender and Competitive Level in Youth Sport

Previous research has indicated that both gender and competitive level (e.g., school type,

team type, and playing status) contribute to the perceptions of the social environments and the

motivational processes in adolescent athletes (Amado, Sánchez-Oliva, González-Ponce, Pulido-

González, & Sánchez-Miguel, 2015; Weiss, 2015). Specifically, Amado and colleagues (2015)

found that in Spanish youth sport participants, parental pressure was a stronger negative

predictor of need satisfaction for boys than girls, whereas need satisfaction was a stronger

positive predictor of intrinsic motivation and a stronger negative predictor of amotivation for

girls than boys. Weiss (2015) revealed that high school starters perceived more positive social

environments than non-starters, so starters might also receive more benefits from the social

environments and need satisfaction that maximize their sport motivational outcomes.

Moreover, organized youth sport experience and dropout are gender- and sport-specific

(Balish et al., 2014; Molinero, Salguero, Concepcin, Alvarez, & Marquez, 2006). A recent

systematic review of youth psychosocial experiences warranted researchers to describe and

investigate three factors when studying psychosocial outcomes: sport types, sport settings (e.g.,

competitive level), and sport involvement (Evans et al., 2017). Exploring the "darker side of

athletic experience" across gender and competitive level (e.g., team type, playing status) by

testing their invariance in this study, therefore, would make a unique contribution by adding

meaningful empirical evidence to the literature. This evidence may provide new knowledge and

practical implications for sport psychology consultants and high school administrative staff to (a)

work with coaches, athletes, and parents individually and/or collectively to foster optimal social

environments that maximize positive motivational outcomes in high school athletes; and (b)

implement individualized motivational interventions across high school boy and girl athletes on

different teams.

Study Aims

Although there is a growing body of quantitative studies examining the influences of

negative social environments on athletes' need frustration and motivational outcomes (e.g.,

Felton & Jowett, 2015), these "darker sides of athletic experiences" have not been examined

using a qualitative approach (Clancy et al., 2016). Moreover, only two studies have investigated

need support and need satisfaction using a qualitative approach (Almagro et al., 2015; Raabe &

Readdy, 2016). Further qualitative research, in addition to existing quantitative research, is

warranted to help us better understand what promotes and undermines autonomy, competence,

and relatedness, respectively. Therefore, the primary purpose of this mixed-method study was to

examine the underlying motivational processes from social environments created by coaches,

peers, and parents to motivational outcomes in high school athletes, with an emphasis on the

relative influence of social agents in need satisfaction and need frustration. The overall research

questions of this study were as follows:

1. How did coaches, peers, and parents, respectively, play a role in protective factors and risk factors for burnout in and dropout from sport?

2. How did the "brighter side" and the "darker sides" of the motivational processes (i.e., basic psychological needs and motivational regulations), respectively, influenced athletes' psychosocial outcomes in sport participation?

3. Were there differences in the motivational pathways for athletes' psychosocial development, burnout, and dropout intention in sport across gender, sport type, and competitive level? If so, how and why were they different?

The quantitative part of this study would test a hypothesized model of HMIEM of

psychosocial outcomes in high school sport participation (see Figure 2). It was hypothesized that

(a) greater coach-created empowering climate, peer-created task-involving climate, and parent-

created task-involving climate would predict greater need satisfaction, which would in turn

predict higher levels of adaptive motivation and outcomes as well as lower levels of maladaptive

motivation and outcomes (Hypothesis 1); (b) greater coach-created disempowering climate, peer-

created ego-involving climate, and controlling parental behavior would predict greater need

frustration, which would in turn predict higher levels of maladaptive motivation and outcomes as

well as lower levels of adaptive motivation and outcomes (Hypothesis 2); and (c) the relative

influence of coach-created motivational climate would be the strongest, and the relative

influence of parent-created motivational climate would be the weakest in satisfaction and

frustration of basic psychological needs and, in turn, positive and negative motivational

outcomes (Hypothesis 3). In addition to the three hypotheses, model invariances were tested

across gender and competitive level for further examination of potential group differences.

The follow-up qualitative part of this study would explore "how" beyond "what"

coaches, peers, and parents contribute to negative social environments, need frustration, and

negative motivational outcomes in sport. While previous qualitative research in sport motivation recruited participants from all available athletes (Clancy et al., 2016), this study recruited participants with relatively high negative motivational outcomes according to their survey responses in the quantitative part of the study. Because these participants were prone to drop out, their voices have direct implications on creating interventions that reduce amotivation, burnout, and dropout. The four specific research questions of the qualitative part were as follows:

1. What kinds of coach-created environment and specific coaching behaviors were protective factors and risk factors for negative motivational outcomes?

2. What kinds of peer-created environment and specific teammate behaviors were protective factors and risk factors for negative motivational outcomes?

3. What levels of parental involvement and specific parental behaviors were protective factors and risk factors for negative motivational outcomes?

4. Were there any differences in the perceptions of the "darker side of athletic experience" (i.e., negative social environments and need frustration) across gender and competitive level? If so, how were they different?

Methods

Participants

Sequential mixed methods sampling with a nested sample (QUAN ➔ QUAL; Teddlie & Yu, 2009) were used in this study. Specifically, extreme (negative/deviant) case sampling was used to explain differences between cases for negative motivational outcomes (Teddlie & Yu, 2007).

Quantitative Part

Four hundred thirty two student athletes, from 9th to 12th grades, were recruited in person from two high schools in two suburban school districts in Texas. Three hundred and forty

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three student athletes returned both the parent consent and student assent and completed at least one of the two surveys, resulting in a response rate of 79.4%. They were a 4A (*n* = 155) and a 5A (*n* = 188) school classified by University Interscholastic League (UIL; http://www.uiltexas.org/alignments) based on school size ranging from 1A (smallest) to 6A (largest). According to the public census data (https://www.usnews.com/education/best-high-schools), the student population of the 4A school was approximately 800, in which 68% were White, 25% were Hispanic, and less than 3% were in each of the other racial/ethnic groups; 36% were economically disadvantaged (i.e., receiving free or reduced lunch). The student population of the 5A school was approximately 2,200, in which 47% were White, 31% were Hispanic, 16% were Black, and less than 3% were in each of the other racial/ethnic groups; 40% were economically disadvantaged.

Any students enrolled in athletics on at least one sport team are eligible to participate in this study. The demographic information and group composition of the participants is displayed in Table 4. The sport group composition of the participants was classified as follows for further analysis: (a) sports included six team sports (baseball, basketball, football, soccer, softball, and volleyball) and four individual sports (cross country, powerlifting, tennis, and track and field); (b) team type included varsity and non-varsity (junior varsity [JV] and freshman) athletes; (c) playing status included starters and non-starters of a team. Twenty one participants missed one survey, so only 322 student athletes were considered as participants who completed the whole study.

Table 4

Demographic and Sport Participation Information of Initial Survey Participants (N = 343)

	Demographic Variables	n	%
Gender	Boys	223	65.0
	Girls	120	35.0
Grade	9	108	31.5
	10	82	23.9
	11	89	25.9
	12	64	18.7
Race/Ethnicity	American Indian / Alaska Native	9	2.6
	Asian	15	4.4
	Black	31	9.0
	Hispanic / Latino	89	25.9
	Native Hawaiian / Pacific Islander	0	0.0
	White	173	50.4
	Two or More Races	26	7.6
Sport team	Baseball	17	5.0
	Basketball (boys)	10	2.9
	Basketball (girls)	13	3.8
	Cross country	30	8.7
	Football	129	37.6
	Powerlifting	2	0.6
	Soccer (boys)	1	0.3
	Soccer (girls)	1	0.3
	Softball	42	12.2
	Tennis	53	15.5
	Track and field	25	7.3
	Volleyball	17	5.0
	Other	3	0.9
Team type	Freshman	70	20.4
	Junior varsity (JV)	120	35.0
	Varsity	143	41.7
	Other	10	2.9
Playing status	Starter	170	49.6
	Non-starter	90	26.2
	Not sure	69	20.1
	Missing	14	4.1

Qualitative Part

A subgroup of 37 participants (24 boys, 13 girls) who participated in the quantitative part were recruited for the qualitative part of this study. This sample size was appropriate ($n = 20$–40) for the qualitative component of an integrative mixed-methods study (Castro, Kellison, Boyd, & Kopak, 2010). Purposeful and stratified sampling was implemented by selecting athletes from four different combinations of gender and sport type (i.e., boys whose primary sport is an individual sport; boys whose primary sport is a team sport, girls whose primary sport is an individual sport, and girls whose primary sport is a team sport) whose survey responses in burnout or amotivation fell within the highest quartile range, as well as responses in dropout intentions higher than the median.

These participants were drawn across team type to maintain a balance of their competition levels for data comparison. Segmentation of homogenous focus groups was used for interviewing participants of the same gender and sport type within each group. This segmentation strategy could create a comfort level that fosters conversations (Hesse-Biber & Leavy, 2011) and allow an in-depth understanding of how athletes of a specific gender and sport type perceive the "darker side of athletic experience."

A total of five athletes declined to participate in the focus group interview; another athlete of the same gender (and preferably sport type) was invited during the interview day. Accordingly, eight relatively homogenous focus groups of high school athletes, four or five in each group, were recruited. All eight groups consisted of athletes of the same gender, and six of the eight groups consisted of athletes of the same sport type (see Table 5). Regarding team type, 13 were varsity athletes, 13 were JV athletes, nine were freshman athletes, and two indicated other that signified they were no longer on a competitive team. Table 6 displays participants'

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levels of negative motivational outcomes based of their survey responses. These levels

determined by comparing participant scores to those of the lower quartile (Q1), median (Q2), and

upper quartile (Q3) within the same gender and sport type. Of the 37 participants, 34, 29, and 30

fell within the highest quartile range, respectively.

Table 5

Composition of Focus Group Participants (N = 37)

Group	Participant	Gender	Grade	Race/Ethnicity	Sport	Sport type	Team type
1	(A) Kobe	Boy	10	White	Football	Team	JV
1	(B) Ethan	Boy	12	White	Football	Team	Varsity
1	(C) Joe	Boy	12	Asian	Football	Team	Varsity
1	(D) Terry	Boy	12	White	Football	Team	Varsity
1	(E) Samuel	Boy	12	American Indian	Football	Team	Varsity
2	(A) Kyle	Boy	11	White	Basketball	Team	JV
2	(B) Jerry	Boy	11	White	Football	Team	Varsity
2	(C) Dylan	Boy	12	American Indian	Football	Team	Varsity
2	(D) Philip	Boy	12	Hispanic / Latino	Track	Individual	Other
2	(E) Louis	Boy	12	White	Football	Team	Varsity
3	(A) Evelyn	Girl	9	Hispanic/Latino	CC	Individual	Freshman
3	(B) Karen	Girl	9	White	Softball	Team	JV
3	(D) Melissa	Girl	11	White	Basketball	Team	JV
3	(E) Teresa	Girl	10	American Indian	Basketball	Team	Freshman
4	(A) Allen	Boy	12	Asian	Tennis	Individual	Varsity
4	(B) Tim	Boy	12	Asian	Tennis	Individual	Varsity
4	(C) Brian	Boy	12	White	Tennis	Individual	Varsity
4	(D) Charles	Boy	9	White	CC	Individual	JV
4	(E) Kevin	Boy	9	White	CC	Individual	Other
5	(A) Emma	Girl	12	White	Softball	Team	Varsity
5	(B) Ashley	Girl	10	White	Softball	Team	JV
5	(C) Carol	Girl	12	Hispanic / Latino	Softball	Team	JV
5	(D) Megan	Girl	12	White	Softball	Team	Varsity
5	(E) Lori	Girl	12	Hispanic / Latino	Softball	Team	JV
6	(A) Chris	Boy	9	White	Football	Team	Freshman
6	(B) Ryan	Boy	9	Hispanic / Latino	Football	Team	Freshman
6	(C) Bruce	Boy	9	Hispanic / Latino	Football	Team	Freshman
6	(D) James	Boy	9	White	Football	Team	Freshman
6	(E) Edward	Boy	9	Hispanic / Latino	Football	Team	Freshman

(table continues)

Group	Participant	Gender	Grade	Race/Ethnicity	Sport	Sport type	Team type
7	(A) Gerald	Boy	11	Hispanic / Latino	Football	Team	JV
7	(B) Jose	Boy	10	Hispanic / Latino	Football	Team	JV
7	(D) John	Boy	10	African American	Football	Team	JV
7	(E) Billy	Boy	10	American Indian	Football	Team	JV
8	(A) Amy	Girl	12	African American	Track	Individual	Varsity
8	(B) Betsy	Girl	9	White	Track	Individual	Freshman
8	(D) Linda	Girl	9	Two or More Races	Track	Individual	Freshman
8	(E) Daima	Girl	10	White	Track	Individual	JV

Note. CC = Cross country; JV = Junior varsity. The parentheses (A), (B), (C), (D), and (E) represent their assigned seat in the focus group.

Table 6

Level of Negative Motivational Outcomes among Focus Group Participants (N = 37)

Focus Group	Participant	Amoti-vation	Amoti-vation level	Burnout	Burnout level	Dropout intention	Dropout intention level	Dropout likelihood
1	(A) Kobe	7.00	High	3.93	High	5.50	High	Higher
1	(B) Ethan	4.50	High	3.40	High	2.00	Mid-Low	Lower
1	(C) Joe	7.00	High	3.87	High	4.50	High	Higher
1	(D) Terry	4.50	High	3.47	High	5.00	High	Higher
1	(E) Samuel	3.50	Mid-High	3.33	High	4.00	High	Lower
2	(A) Kyle	5.50	High	3.80	High	7.00	High	Higher
2	(B) Jerry	4.00	High	3.33	High	7.00	High	Higher
2	(C) Dylan	4.00	High	3.73	High	5.50	High	Higher
2	(D) Philip	5.50	High	3.07	High	4.00	High	Lower
2	(E) Louis	5.25	High	3.33	High	7.00	High	Higher
3	(A) Evelyn	5.25	High	3.07	High	2.00	Mid-High	Lower
3	(B) Karen	1.00	Low	2.53	Mid-High	1.00	Low	Lower
3	(D) Melissa	4.75	High	3.87	High	4.50	High	Higher
3	(E) Teresa	4.75	High	3.40	High	4.50	High	Higher
4	(A) Allen	3.75	Mid-High	3.47	High	3.00	High	Lower
4	(B) Tim	3.00	Mid-High	3.53	High	3.67	High	Lower
4	(C) Brian	3.50	Mid-High	3.13	High	5.00	High	Higher
4	(D) Charles	6.00	High	3.73	High	3.00	High	Lower
4	(E) Kevin	3.75	High	3.20	High	6.00	High	Higher
5	(A) Emma	6.50	High	4.27	High	4.00	High	Lower
5	(B) Ashley	4.75	High	3.33	High	3.00	Mid-High	Lower
5	(C) Carol	7.00	High	3.00	High	7.00	High	Higher
5	(D) Megan	6.25	High	2.27	Mid-High	7.00	High	Higher
5	(E) Lori	5.50	High	3.47	High	4.00	High	Lower
6	(A) Chris	6.25	High	4.60	High	4.00	High	Lower
6	(B) Ryan	3.00	High	2.20	High	4.50	High	Higher
6	(C) Bruce	5.50	High	2.40	High	4.00	High	Lower
6	(D) James	3.50	High	3.33	High	3.50	High	Lower

(table continues)

Focus Group	Participant	Amotivation	Amotivation level	Burnout	Burnout level	Dropout intention	Dropout intention level	Dropout likelihood
6	(E) Edward	6.00	High	1.93	Mid-High	2.50	High	Lower
7	(A) Gerald	3.25	Mid-High	3.00	High	2.00	Mid-High	Lower
7	(B) Jose	6.75	High	3.93	High	4.00	High	Lower
7	(D) John	5.25	High	3.62	High	5.50	High	Higher
7	(E) Billy	7.00	High	4.93	High	7.00	High	Higher
8	(A) Amy	2.50	Mid-High	2.93	High	6.00	High	Higher
8	(B) Betsy	4.00	High	3.13	High	2.00	Mid-High	Lower
8	(D) Linda	4.00	High	3.53	High	7.00	High	Higher
8	(E) Daima	4.00	Mid-High	3.00	High	1.00	Low	Lower

Note. The parentheses (A), (B), (C), (D), and (E) represent their assigned seat in the focus group. Levels of the negative motivational outcomes were determined using the scores of the lower quartile (Q1), median (Q2), and upper quartile (Q3): Low (<Q1), Mid-Low (Q1–Q2), Mid-High (Q2–Q3), High (>Q3). Dropout likelihood was determined by whether dropout intention was higher than scale mid-point 4 (higher) or not (lower).

Data saturation occurred around the seventh focus group, so the focus group size was deemed appropriate. In other words, more participants would have been recruited if there was new meaningful information gathered upon the completion of the eighth focus group interview.

Procedures and Measures

Appendix A displays the timeline of this study. Upon approval of the University Institutional Review Board (IRB), informed parental consent and child assent forms were obtained from the participants in accordance with the IRB and the school district requirements. Two 20-minute surveys (see Appendix B) were used to collect quantitative data on the same or following week to reduce participant fatigue. To minimize survey order effects, a counterbalanced procedure was implemented in which about half of the participants completed survey 1 before survey 2, and the other half did the opposite. Both surveys included a researcher-assigned ID number and demographic information including participants' date of birth, grade level, gender, race/ethnicity, and primary sport for matching participants. If participants played

on more than one sport team, they would answered the survey items based on the primary sport team in which they invested the most time year-round.

Survey 1

The first survey mainly assessed participant perceptions of the social environments created by the three social agents (i.e., coaches, peers, and parents) described below. Additional sport participation information was assessed: number of sports played, years of playing the primary sport, hours of training per week, timing of the season (i.e., pre-season, beginning of the season, mid-season, end of the season, and off-season), playing status (starter vs. non-starter), and the main coach's gender. Parental makeup including the composition of biological and stepparent was also be assessed.

- Coach-created motivational climate – The coach-created motivational climate was measured using the 34-item Empowering and Disempowering Motivational Climate Questionnaire (EDMCQ–C; Appleton et al., 2016). Participants reported on the empowering and disempowering atmosphere the main coach created in the last 3–4 weeks on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with respect to five subscales: Task-Involving, Autonomy-Supportive, and Socially-Supportive subscales for an empowering climate, and Ego-Involving and Controlling Coaching subscales for a disempowering climate. The item scores could be used to create corresponding first-order latent variables as well as two second-order latent variables—an empowering climate and a disempowering climate—for data analyses. The measure showed good validities and reliabilities in youth athletes aged 8–17 years across various sports and countries (Appleton et al., 2016; N. Smith et al., 2016).

·   Peer-created motivational climate – The peer-created motivational climate was measured using the 21-item Peer Motivational Climate in Youth Sport Questionnaire (PeerMCYSQ; Ntoumanis & Vazou, 2005). Participants responded to the stem "On this team, most athletes…" on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) regarding five subscales: Improvement, Relatedness Support, and Effort subscales for a task-involving climate, and Intra-Team Competition/Ability and Intra-Team Conflict for an ego-involving climate. The item scores could be used to create corresponding first-order latent variables as well as two second-order latent variables—a task-involving climate and an ego-involving climate—for data analyses. The measure demonstrated good validities and reliabilities in youth athletes aged 11-17 years across various sports and countries (Jõesaar et al., 2011; Vazou, 2010).

·   Parent-created motivational climate – The perceived motivational climate created by one parent (father/mother/stepfather/stepmother) was assessed with the 18-item Parent-Initiated Motivational Climate Questionnaire (PIMCQ-2; White, 1996). Participants responded to the questions on a 5-point Likert-type scale ranging from 1 (*never*) to 5 (*always*) regarding three subscales: Learning Climate for a task-involving climate, and Worry-Conducive Climate and subscales for an ego-involving climate. The measure demonstrated good validities and reliabilities in youth athletes aged 9–20 years across various sports and countries (see Harwood et al., 2015).

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Survey 2

The second survey assessed SDT constructs and psychosocial outcomes in sport participation experienced by the participants.

·   Need satisfaction and need frustration – Satisfaction of autonomy, competence, and relatedness needs was measured using a 6-item autonomy scale (Hollembeak & Amorose, 2005), the 5-item Perceived Competence subscale of Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 1989), and the 5-item Need for Relatedness Scale (NRS; Richer & Vallerand, 1998), respectively. Frustration of the three psychological needs was measured using the 12-item Psychological Need Thwarting Scale (PNTS; Bartholomew et al., 2011). Participants responded to these items on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) that best reflect their perceptions. Item scores for satisfaction and frustration of autonomy, competence, and relatedness could be used to create the respective first-order latent variables as well as second latent variables of need satisfaction and need frustration. These measures revealed good validities and reliabilities in assessing need satisfaction (Amorose & Anderson-Butcher, 2007; Reinboth et al., 2004) and need frustration (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Felton & Jowett, 2015) in high school-aged athletes across sports and countries.

·   Motivational regulations – Intrinsic motivation, four forms of extrinsic motivation (integrated, identified, introjected, and external regulations), and amotivation in sport were measured with a 24-item Behavioral Regulation in Sport Questionnaire (BRSQ; Lonsdale, Hodge, & Rose, 2008). Participants responded to six 4-item subscales with the stem "I participate in my sport…", followed by a reason for sport participation, on a 7-point Likert-type scale ranging from 1 (*not at all true*) through 4 (*somewhat true*) to 7 (*very true*). Item scores for the six forms of motivation were first used to create its own latent variable. The first-order latent variables intrinsic motivation, integrated regulation, and identified regulation could then be used to create a second-order latent variable of autonomous motivation, while the two latent variables introjected regulation and external regulation could be used to create a second-order latent

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variable of controlled motivation. The measure demonstrated good validities and reliabilities in youth athletes aged 11–17 years across various sports and countries (Jõesaar et al., 2011; Vazou, 2010).

· Subjective vitality – Subjective vitality in sport participation was measured using the 5-item version of the Subjective Vitality Scale (SVS; Ryan & Frederick, 1997). Participants responded to the items on a 7-point Likert-type scale ranging from 1 (*not at all true*) through 4 (*somewhat true*) to 7 (*very true*). The measure demonstrated good validities and reliabilities in youth athletes aged 12–17 years across various sports and countries (Alvarez et al., 2012; Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011).

· Burnout – Athlete burnout was measured using the 15-item Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001), assessing three burnout dimensions: reduced sense of accomplishment, emotional and physical exhaustion, and sport devaluation. Participants will respond to the items on a 5-point Likert-type scale of 1 (*almost never*), 2 (*rarely*), 3 (*sometimes*), 4 (*frequently*), and 5 (*almost always*). There are two reverse-scored items: "I'm accomplishing many worthwhile things in [sport]" and "I feel successful at [sport]." The three burnout dimensions were used to create a latent variable of burnout. The measure demonstrated good validities and reliabilities in high school-aged athletes across various sports and countries (Harris & Watson, 2014; Isoard-Gautheur & Guillet-Descas, 2012).

· Intention to drop out – Intention to drop out of primary sport was assessed with four items used by Quested et al. (2013), based on Sarrazin et al.'s (2002) measure and the theory of planned behavior on leisure choice (Ajzen & Driver, 1992). One more open-ended question was created and added in this study to assess the main reason for participants' intention to drop out.

The responses to this question aided in the participant selection for focus group interviews as well as the triangulation of qualitative findings.

Qualitative Data

A review of qualitative research in sport psychology indicated few studies used participant observation in combination with interviews and focus groups (Culver, Gilbert, & Sparkes, 2012). Therefore, this study used multiple data collection methods by triangulating focus group interviews with field observations and quantitative survey responses. This triangulation could enhance the trustworthiness of the findings and explore how the interview responses are manifested in the real-life sport setting (Tracy, 2010).

· Focus group interviews – All focus group interviews were conducted at school sites. Semi-structured interviews were used with an interview guide (see Appendix C) aligned with the research questions, consisting of standardized questions followed by open-ended sub-questions to tap into various roles of coaches, peers, and parents in the motivational processes in high school athletes. After creating the interview guide, the researcher discussed with previous high school athletes as well as a qualitative researcher to examine whether the questions were developmentally appropriate and needed modifications. Slight adjustments were made to reduce the number of questions and narrow the focus more specifically to the roles of coaches, peers, and parents in participants' sport experience.

The interviews were audiotaped for transcription with additional verbal permission from the participants. The researcher was the moderator for each interview, while an assistant was present to help with notetaking, timekeeping, and preparing for interview materials. Each of the interviews started with broad questions including self-introduction among group members with

sport participation background as a "warm-up" to help participants feel comfortable contributing to the conversation. At the end of the interview, participants were invited to ask any questions and provide supplemental information beyond the interview questions. Each focus group interview lasted for between 45 minutes and 68 minutes. After the interview, participants completed a short evaluation form (see Appendix D) related to their perceptions of the focus group. They also received a $15.00 gift card as their incentive for participation.

A focus-group approach was chosen, because it served as a "safe space" for athletes who experienced negative motivational outcomes to share experiences and perspectives (Dodson, Piatelli, & Schmalzbauer, 2007). For example, a participant wrote in the evaluation "The group was good, everyone participated and said their opinion and stories. Was easy to spread thoughts and opinions in groups" (Kyle, JV-BB). Moreover, focus groups could be a means of intervention through education, exploration, and collaboration with participants (Goltz, 2009). For instance, in the evaluation form, participants explained that "It was great to tell how I felt instead of keeping it inside. We never discussed this out loud as a team, but I'm glad we addressed it" (Allen, V-T); "I really liked how honest and receptive the conversation was. My opinion and feelings were well accepted" (Tim, V-T); and "I feel like I can relate to the things said a lot more than did before" (Karen, JV-SB).

·   Field observations – After the focus group interviews, direct observations of participants' sport teams were conducted twice during the athletic period or afterschool practice. Observations were schedule with the head coach of the teams upon their consent; only one coach denied the request for observation. There were 18 observations in total (High School 1's boys basketball, girls basketball, cross country, and football teams, and High School 2's cross country, football, softball, tennis, and track teams). Field notes were taken regarding the coaching

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climates and peer interactions within a team, with emphasis on the coaches' verbal and nonverbal communications with the athletes.

Further, the Multidimensional Motivational Climate Observation System (MMCOS; Smith et al., 2015) was used to assess the objective motivational climates created by the main coach (mostly head coach) during practice. The observational tool demonstrated good validities and reliabilities in youth sport coaching across a number of countries in Europe (N. Smith et al., 2015, 2016). Using an observational sheet (see Appendix E) based on the MMCOS, one or two coders (i.e., trained research assistants) and the researcher rated the coaching behavior and strategies based on the potency that represents the frequency, intensity, and pervasiveness of five environmental dimensions—autonomy supportive (6 strategies), task-involving (4 strategies), relatedness supportive (5 strategies), controlling (6 strategies), and ego-involving (3 strategies)— ranging from 0 (*not at all*) to 3 (*strong potency*). The mean scores of these climates were calculated to compare with the survey and interview data. Because the focus group participants perceived different levels of motivational influence from different coaches, this observation tool served as a guide for triangulation and discussions instead of an analysis within the study.

Data Analyses

Quantitative Analyses

Prior to data analyses, the dataset was screened for missing data, invalid values, outliers, and normality. Cases missing more than 30% of the complete data were removed; other missing values were replaced depending on the pattern of missingness (Graham, 2009). As this study included multivariate analyses across gender, the assumption of multivariate normality was assessed using the graphical method MULTINOR (Thompson, 1990), which plotted chi-square

values against Mahalanobis distance (D^2) of the study variables for boys and girls separately. After data inspection and imputation, three sets of statistical procedures were performed using a statistical significance of $p < .05$ criteria for all analyses.

· Preliminary analyses – Descriptive statistics, Cronbach's alpha, and bivariate correlations were computed in SPSS Version 24.0 as preliminary analyses to examine the reliabilities and adequacy of the data for further analyses.

· Confirmatory factor analyses – Multigroup confirmatory factor analyses (CFAs) were used to examine the validities of the study variables across groups, including gender and team type. Playing status was not examined as about one-fourth of participants did not know their status or not respond to that item. The sample size of 322 was appropriate for multigroup CFA and SEM according to Chen (2007) who suggested an adequate sample of >300 for invariance testing. The overall model significance was determined using goodness-of-fit indexes, including the comparative fit index (CFI), Tucker-Lewis Index (TLI), root mean square error of approximation (RMSEA), and standardized root square residual (SRMR). A model was considered as an adequate fit according to Marsh, Hau, and Wen's (2004) recommendation of CFI and TLI > .90 and RMSEA and SRMR < .08 as a good fit based on Hu and Bentler's (1999) criteria of CFI and TLI > .95, RMSEA < .06, and SRMR < .08; a model was considered as a poor fit with values of RMSEA and SRMR > .10 (Browne & Cudeck, 1993). After the first CFA attempt for each study variable, post-hoc model modification indexes were examined with reference to theoretical and measurement concepts deemed appropriate to improve mode fit (Kline, 2016). Further, the significance level and the factor loading λ (i.e., pattern coefficient) of each indicator were investigated according to Comrey and Lee (1992): $\lambda = .32$ (poor), .45 (fair), .55 (good), .63 (very good) or .71 (excellent). Items were removed if they had a poor loading;

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they might be removed if they had a fair loading depending on the factor structure and the values

of the factor loading and residuals of a scale. A total of nine final overall CFA models were used

to represent the factor structure to be tested for measurement invariance.

After obtaining the final overall CFA model with adequate or good fit, configural and

metric invariance testing were performed to determine the invariance of the factor structure

across gender and team type. Configural invariance testing provides the first level of factorial

validity by showing whether the overall model fits the data well across groups according to the

original factor structure (Sass & Schmitt, 2013). Assuming a model is configural invariant, the

next step was to conduct metric invariance testing by constraining the unstandardized factor

loadings across groups and comparing the model across the configural model. Invariance of the

two models was determined by $\Delta\chi^2$ test, accompanied by ΔCFI, ΔRMSEA, and ΔSRMR,

because $\Delta\chi^2$ test is sensitive to sample size (F. F. Chen, 2007). Due to unequal subsample sizes of

less than 300 participants in each group, the values of ΔCFI > –.005, ΔRMSEA > .010, and/or

ΔSRMR > .025 were used to determine noninvariance between two models (F. F. Chen, 2007).

Among these three indices, ΔCFI was the major criterion for determining invariance in addition

to the significance of $\Delta\chi^2$; while ΔRMSEA is easily influenced by sample size and mode

complexity, ΔSRMR typically rejects an invariant model more than other indices when sample

size is relatively small (F. F. Chen, 2007). If $\Delta\chi^2$ test (p > .05) and the change of model fit indices

were not significant, the scale items were considered to manifest in the same way across groups;

the model would be considered metric invariant. Because there were several latent constructs that

were consisted of more than one subconstruct (e.g., an empowering climate composed of

autonomy-supportive, social-supportive, and task-involving climates), the first-order metric

invariance was tested followed by the second-order metric invariance. This procedure helped

identify the specific source of noninvariance in the first- or second-order factor structure if the CFA model was found to be noninvariant (F. F. Chen, Sousa, & West, 2005).

Scalar invariance was not tested in this study because (a) measurement invariance was not a research question or purpose of this study; and (b) score means were not compared across groups as part of the study (Steenkamp & Baumgartner, 1998). Thus, only partial measurement invariance was tested in this study with the goal to investigate the potential factor loadings across different groups (van de Schoot, Lugtig, & Hox, 2012). If any CFA models were found to be noninvariant across groups, the problematic items with low factor loadings and high residual variance were either removed, or their loadings would be allowed to be freely estimated across groups for partial measurement invariance in the model testing described below (F. F. Chen et al., 2005).

· Model testing – Multigroup structural equation modeling (SEM) was conducted using AMOS Version 25.0 to test the hypothesized models (see Figure 2) in the overall sample, as well as across gender and team type, respectively. Two alternative models (see Figures 3 and 4) for the "brighter side" and the "darker side" were also tested to compare against the hypothesized model in terms of model fit. A two-step modeling approach was implemented to test the full hypothesized models as well as alternative models (Kline, 2016): evaluating and revising the measurement model with all latent variables followed by the structural models with the same model structure. The same criteria for an adequate fit (CFI and TLI > .90, RMSEA < .08, SRMR < .08) and a good fit (CFI and TLI > .95, RMSEA < .06, SRMR < .08) of the CFA models were used to evaluate the SEM models; the measurement and the structural models were revised based on the modification indices deemed appropriate based on theories.

Two modeling approaches, item-level and parcel-item modeling, were performed for the model testing. Although using individual items for modeling could maintain objectivity of the data as close to the participant response as possible, it could create model fit issues with large degrees of freedom (T. D. Little, Rhemtulla, Gibson, & Schoemann, 2013). Little and colleagues (2013) provided an example that with the data of five nine-item constructs collected from two time points, an item-level model would have 3,825 degrees of freedom and at least 270 parameter estimates, which would constitute a model that is almost intractable to estimate. The largest hypothesized model of this study had 14 constructs, some of which consisted of more than 10 items. Therefore, using item-level modeling might create model fit issues and using parcel-level modeling might be more appropriate in this study.

Parceling is a measurement technique of combining (averaging or summing) items into parcels containing two or more items; the aggregate scores are then used as indicators of a latent construct in a measurement or structural model (T. D. Little et al., 2013). Because there were over 100 items in each hypothesized model, parceling could reduce the number of indicators to produce a more manageable ratio of observations to parameters and thus degrees of freedom, which would in turn improve model convergence and stability. Using parcels has additional advantages over using individual items loaded onto latent variables, such as reducing the risk for dual loadings, sampling error, and the degrees of freedom for a model structure closer just-identification, as well as improving normality and reliability of the data (T. D. Little et al., 2013). On the other hand, using parcels is "almost always a better choice than scale scores" that some researchers used for path analysis without a measurement model (T. D. Little et al., 2013, p. 294), because scale scores represented by a single indicator result in biased models that contain specific variance and do not account for error variance. In this study, two different parceling

strategies were used for all multidimensional constructs and the unidimensional constructs that were composed of more than five items (i.e., parent-created learning climate): (a) a facet-representative parceling approach (T. D. Little, Cunningham, Shahar, & Widaman, 2002)—parcels using mean scores of subconstructs—was used for multidimensional constructs (e.g., empowering and disempowering climates); and (b) a balancing approach (Landis, Beal, & Tesluk, 2000) was used for unidimensional constructs (for further details of the parceling strategies, see Little et al., 2013).

If the overall SEM model had an adequate or a good fit, its validity and reliability would be further investigated and compared to those of other alternative models. Internal consistency of the latent constructs in the measurement models was examined using composite reliability (CR > .70; Hair, Anderson, Tatham, & Black, 1998), accounting for the strengths of the relationships between each indicator and the corresponding latent construct; construct validity was examined using average variance extracted (AVE > .50; Hair et al., 1998), representing amount of variance explained by the latent constructs versus measurement errors. With acceptable CR and AVE, invariance testing would be performed across gender and across team type accordingly. Measurement invariance was tested first before structural invariance in order to obtain appropriate model structures across gender and across team type. The measurement models were tested for configural and metric invariance using the same approach as the CFA models with criteria of nonsignificant $\Delta\chi^2$ tests, ΔCFI < –.005, ΔRMSEA < .010, and/or ΔSRMR < .025 for invariance. On the other hand, the structural models were tested for invariance by following the steps outlined by Byrne (2004), with the criteria of nonsignificant $\Delta\chi^2$ tests for invariance. With an appropriate model structure, structural invariance testing was completed in three steps. First, a freely estimated baseline model with partial measurement invariance (i.e., constraining all metric

parameters) was tested for model fit. Second, if the baseline model fit the data well, all structural paths between social environments and psychosocial outcomes were constrained to be equal across groups to assess changes in the model fit. If noninvariance existed, the paths would be constrained one at a time to examine the source of noninvariance, accompanied by z-score comparisons (Clogg, Petkova, & Haritou, 1995). Third, the structural covariances (i.e., coach-created, peer-created, and parent-created climates) were constrained to be equal using the same procedure as the structural paths to test for their invariance.

In examining model fit, it is important to note that "the test statistics and fit indices are very beneficial, but they are no replacement for sound judgment and substantive expertise" (Bollen & Long, 1983, p. 8). Model specification conditions, estimation methods (e.g., maximum likelihood, generalized least squares), and sample size influence the value of fit indices. Thus, a general rule of thumb or a golden rule does not apply in all models (Fan, Thompson, & Wang, 1999; Marsh et al., 2004; Tomarken & Waller, 2005). Therefore, judgment for model fit was made based on the abovementioned criteria for fit indices that should not be seen as absolute cutoffs (F. Chen, Curran, Bollen, Kirby, & Paxton, 2008; Tomarken & Waller, 2005). For instance, testing the hypothesized models with large model complexity in this study caused penalty in some fit indices, such as CFI and TLI values which are reduced with more parameter estimations (Marsh et al., 2004). Because the general cutoff for TLI tended to reject more complex models and SRMR tended to reject simpler models, TLI close to but not achieving >.90 would be considered acceptable if all CFI, RMSEA, and SRMR values achieved the respective standards for the complex measurement and structural models with large degrees of freedom; on the other hand, SRMR values of .08–.10 would be considered acceptable if all CFI, TLI, and RMSEA values achieved the respective standards for the simple CFA models with few

parameters and small degrees of freedom. Some additional considerations include: (a) CFI and TLI are less influenced by sample size than other fit indices (Cheung & Rensvold, 2002; Marsh, Balla, & McDonald, 1988); (b) if the RMSEA for a null model is smaller than .158, CFI and TLI values would be too small to be considered; (c) RMSEA values are inflated with smalls degree of freedom and/or a small sample size and therefore may not be considered (Kenny, Kaniskan, & McCoach, 2015); and (d) SRMR values are also inflated with small degrees of freedom and/or a small sample size as well as lower model complexity (Marsh et al., 2004).

In addition to the comparison of nested models, comparison of non-nested alternative models was performed using predictive fit indices—the Akaike information criterion (AIC) and the Bayesian information criterion (BIC)—instead of the $\Delta\chi^2$ test and change in fit indices that only apply to nested models. Lower AIC and BIC values indicate better fitting and more parsimonious models that are typically preferred over models with high AIC and BIC values (Bollen & Long, 1983). After obtaining the final adequate- and good-fitting models, the significance and the magnitude of the structure (path) coefficient would be examined, including both direct and indirect effects, for interpretation. To test whether the statistical significance of the indirect effects of the social environments on motivational outcomes were significant, a bootstrapped procedure was performed using bias-corrected 95% confidence interval (CI) with 5,000 samples (Preacher & Hayes, 2008). If a CI did not include a value of zero, an indirect effect was considered as significant.

Qualitative Analyses

The process of data analysis started after the first focus group interview. Content analysis was used to identify meaningful units that relate to the roles of coaches, peers, and parents on the

motivational processes in high school athletes. Specifically, eight steps were implemented to enhance the trustworthiness, credibility, transferability, and confirmability of the analysis and findings in this study (Keegan et al., 2009):

1. Transcribed focus group interviews verbatim.

2. Read and reread transcripts, as well as relistened to audiotapes to enhance immersion in and familiarization with the data.

3. Divided quotes into three separate clusters and identified meaning units (a phrase, sentence, or a paragraph) that corresponded to coaches, peers, and parents.

4. After creating a codebook (see Appendix F) with pre-determined codes based on the SDT and AGT frameworks, the researcher (also a coder) discussed the codes and sample meaning units with two additional coders. The three coders then conducted deductive content analysis independently on the same data of one focus group using NVivo Pro Version 11 (QSR International, 2015)

5. Compared the analysis among the three coders using Cohen's κ (Cohen, 1960) to assess intercoder reliability by accounting for agreement by chance. The values of κ = .40–.60 and >.80 represented satisfactory and perfect agreement, respectively (Burla et al., 2008). The researcher discussed disagreements with the two coders, and each coder conducted content analysis on the same data once more for another intercoder reliability assessment. While agreement was achieved on the majority of the codes, the researcher made a final decision on the codes for a few remaining disagreements. The three coders then conducted content analysis independently on the data of another focus group by repeating the steps for achieving intercoder agreement. After the satisfactory agreement was achieved for the two focus group data, only the

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researcher coded the six other focus group data.

6. During deductive content analysis, the researcher noted potential content related to the purposes of study that did not match with pre-determined codes. After finishing the deductive analysis for all eight focus groups, the researcher conducted content analysis inductively with emergent codes that existed across groups. The researcher discussed with the two coders, an external qualitative researchers, and an external research who studied parenting to assess the appropriateness of the emergent codes. Constant comparison across gender and team type was performed to make adjustment on the existing code, followed by the frequency analysis of codes and categories.

7. Performed member reflections (instead of member checking; see Tracy, 2010) by having a follow-up individual conversation with focus group members to not only ensure their interview responses were accurately interpreted but also yield additional information for deeper and richer analysis (Bloor, 1997).

8. Engaged in an iterative consensus validation process to label the codes and categories with rich and thick descriptions as well as examples, which allows the transfer of the findings from this study to other similar high school sport settings (Lincoln & Guba, 1985). In doing so, appropriate quotes were chosen to represent each code and category with information about participants' gender, sport, and team type.

Field notes from the practice observations, with the aid of observed coach-created motivational climate, were used to triangulate the codes and categories of the interview responses for interpretation of the results. These field notes for each team were compared to the interview responses of the respective participants for triangulation and interpretation. Because the researcher and coders are considered as the instrument in qualitative research, their training

background and experience are important to the data analysis process and the credibility of the findings (Patton, 2002).

· Researcher background – The researcher was a doctoral candidate in educational psychology with a concentration in sport pedagogy. He earned a master's degree in counseling psychology with a concentration in career and sport psychology before his doctoral studies. The researcher had studied and researched on the topic of motivation for sport and exercise using self-determination theory for eight years prior to this study. His previous research was all quantitative studies, and this study was his first one using qualitative design and analysis. Regarding the training in qualitative and mixed-methods research, the researcher took two courses in qualitative research methods and analysis during his doctoral studies. Furthermore, he completed a manuscript on the use of content analysis in sport motivation studies, as well as attended online and conference workshops on mixed-method studies.

In terms of personal and sports background, the researcher was born and raised in Hong Kong until he finished college and came to the U.S. in 2011 for graduate studies. He started playing organized sports at the age of five and played on five school sports teams during middle and high school, including table tennis, badminton, track and field, soccer, and basketball. The researcher specialized in table tennis to play on an elite regional team and later at the collegiate level. Furthermore, the researcher had an international coaching certification in table tennis and coached the sport since college. Throughout his master's and doctoral studies, the researcher worked as a sport psychology consultant with collegiate and high school athletes on performance enhancement and mental health issues, as well as a counselor who provided career and general counseling.

· Coder background – The two additional coders, a male and a female, were doctoral students in counseling psychology with a concentration in sport psychology. Both of them were also sport psychology consultants who worked with collegiate athletes on performance enhancement and mental health issues.

The male coder earned a master's degree in psychological sciences in a U.S. institution. He took a mixed-methods class in his masters' program and completed a research project on coach feedback to collegiate athletes using a SDT framework (autonomy-supportive vs. autonomy-thwarting change-oriented feedback) with deductive content analysis. Further, he competed a convergent parallel mixed-methods study for his thesis, using a qualitative and quantitative strand to explore the relationship between the motivational climates (combined framework of SDT and AGT) created by the athletic trainer and athlete's rehabilitation adherence. In terms of sports background, the male coder had competitive sport experience for nine years, starting in sixth grade and ending in his junior year of college. He played varsity football, varsity basketball, and threw shot put in high school and later played football at the NCAA Division I level. He had a relatively positive experience with his coaches, parents, and peers, whereas his only negative experience in sport came from a basketball coach. All of his coaches were males.

The female coder earned a master's degree in exercise science in a Canadian institution. She conducted a qualitative study on interpersonal emotion regulation for her thesis using inductive and deductive content analysis as an iterative process. During her master's studies, she also completed a qualitative methods class and was the lead research coordinator for two other research projects involving qualitative analysis. In terms of sports background, the female coder played on her high school's volleyball, basketball, golf, cross country, and ultimate Frisbee

teams. She had positive experiences across her school sports teams, although some of her coaches did not have a strong background in the sport. In addition, she played club soccer for about five years and club volleyball for four years. She decided to specialize in volleyball in 10th grade and played in college for two years until she underwent injuries and surgeries. She had both male and female coaches during her collegiate career. Her parents were very supportive in her sport participation and attended her games frequently.

· Reflexivity – Reflexivity is a "thoughtful, conscious self-awareness" (Finlay, 2002, p. 532), which taps into an immediate, continuing, and dynamic process. Its goal is to understand how researchers, the world, and the researchers' lived experience are connected with and influence each other (Finlay, 2002). Qualitative researchers should recognize how their subjectivity and potential bias affect the research process in order to enhance trustworthiness and credibility through self-reflexive practice. This practice includes a confrontation of researchers' own background, interests, and biases in order to draw attention to their own cultural and social identity without marginalizing those of others (McGannon & Johnson, 2009). Therefore, the process of bracketing (Patton, 2002) was performed and described below to help the researcher reflect on his own assumptions and bias related to high school sport participation and the motivational influence of coaches, peers, and parents. The self-reflexive process was conducted throughout the stages of research design, data collection, data analysis, and final writing.

The researcher's sport experiences could cause certain assumptions about others' experiences. In the process of bracketing, the researcher was cognizant of how his social environments in sport influenced his motivation, which in turn affected his enjoyment and performance in sport. Specifically, he experienced both positive and negative influences from his sports teams that reflect various types of coaching and team environments. The researcher

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specialized in table tennis because he enjoyed that team environment, signified by the genuine love and care from his coaches (male) as well as close relationships among teammates. In contrast, he did not get much playing time in basketball and was not as close to his teammates, so he stopped playing on the school team after three years of participation. He realized his teammates in team sports were more ego-oriented and negative than those in individual sports. Parental and other environmental influences were also important factors that influenced the researcher's sport experience. He almost dropped out of sport during the junior and senior years of high school due to academic pressure. Meanwhile, the researcher could not continue to play on the elite regional team anymore due to the age limit of 16. These high school sport experiences led to the researcher's inquiry into the specific motivational climates and processes attributable to different social agents (i.e., coaches, peers, and parents) during high school.

Later in college, the researcher was debating whether to pursue table tennis due to sport devaluation and a reduced sense of accomplishment. Eventually, he tried out and make the team at the beginning of his freshman year. He found out his coach (female) was extremely supportive and cared much about the team environment as well as each individual athlete regardless of their performance. The empowering climate created by his coach and the cohesive team environment kept the researcher in collegiate sports with greater autonomous motivation. He attributed the team's two-time national champion in his collegiate career to these positive social environments.

In addition to being an athlete, the researcher was also a table tennis coach who held certain values in coaching. His coaching philosophy centered on prioritizing the psychological needs and personal development of youth athletes in sports as well as other life domains. In practice, he applied self-determination theory, particularly satisfaction of basic psychological needs (i.e., autonomy, competence, and relatedness), to optimize the sport experience of both

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elite and recreational athletes. When organizing and coaching his table tennis teams, the researcher actively sought opportunities to (a) provide team members with choices in training and seek their input (i.e., autonomy); (b) offer encouragement and constructive feedback to help team members improve their skills (i.e., competence); and (c) enhance team cohesion by understanding each team member as a player and a person and celebrating successes (i.e., relatedness). On the other hand, he had poor perceptions of coaches' controlling behaviors and ego orientation such as the "winning at all costs" attitude.

As a sport psychology consultant who worked with collegiate and high school athletes, the researcher identified many athletes' positive and negative sport experience related to coach-created and peer-created environments. For instance, (a) some athletes wanted to have more choices in training and competition schedule instead of always following directions (i.e., autonomy); (b) some athletes wanted to receive more encouragement and positive feedback instead of being yelled at by coaches (i.e., competence); and (c) some athletes wanted to be accepted by and more connected to teammates (i.e., relatedness). These experiences and observations provided him with real-life support to answer his queries about the roles of the three social agents and basic psychological needs on athletes' motivation, burnout, and dropout in sport. In order to bracket his experience for research and promote practice reflexivity (Lincoln & Guba, 1985), the researcher conducted peer debriefs with the two coders as well as at a meeting with a group of sport psychology consultants regarding his perspectives on motivational climates created by social agents in review of the content analysis results.

Mixed-Methods Integration

 With this sequential mixed-method study, the mixing of methods and data integration occurred across research design, data analysis, and results reporting. The first strategy of data integration was performed using the results of the first method (QUAN) to inform the second method (QUAL) in this study (Greene, Caracelli, & Graham, 1989). This strategy was used to obtain a nested sample for comparative analysis between the overall high school athlete sample and those who experienced amotivation or burnout with a heighten intention to drop out of sport. Data transformation was performed to allow the comparison between the survey responses and focus group interviews (Leech & Onwuegbuzie, 2010). In categorizing the levels of negative motivational outcomes in the qualitative sample, the quantitative survey data were qualitized to determine low, mid-low, mid-high, and high levels of amotivation, burnout, and intention to drop out levels among focus group participants using the quartile and median scores in the quantitative sample (Bazeley, 2012).

 To investigate the relative influence of the three social agents in the "darker side of athletic experience," the results from the quantitative part were compared and contrasted with those from the qualitative part for data triangulation and elaboration as the second data integration strategy. Specifically, the qualitative codes and categories were quantitized using frequency analysis to represent the relative contributions of these social agents to satisfaction and frustration of basic psychological needs (Bazeley, 2012). The quantitative and qualitative results regarding the relative influence of the coach-created, peer-created, and parent-created motivational climates were tabulated side by side, across gender and team type, for further comparisons between high school athletes in general and those experiencing negative motivational outcomes.

To further identify consistencies and inconsistencies across focus group participants and facilitate understandings of different negative motivational outcomes, cross-case comparison was used as the third data integration strategy. This comparison focused on the similarities and differences in the relative influence of the social agents, both within and between the higher dropout intention group and the lower dropout intention group in the qualitative sample, as well as the between the lower dropout intention group and the overall quantitative sample. Due to the emphasis of qualitative research on the depth over the breath of understanding, the richness of individual experience over the general perceptions, and the context generalizability (i.e., case-to-case transfer) over statistical generalizability (Leech & Onwuegbuzie, 2010; Palinkas, 2014), any deviant cases within the qualitative sample and subsamples were not to disapprove the general findings. Instead, extreme case analysis would be conducted to seek disconfirming evidence of a particular case in detail (Bazeley, 2012). This analysis would include reexamining the survey response, meaning units, and member reflections of the deviant cases, with special consideration of their sports background and demographic information. A conceptualization of these cases would be presented beyond that of the corresponding subsample. This plan for comprehensive analyses helped enhance the quality and rigor of this study, which could in turn facilitate the transfer of research to evidence-based practice across contexts and cases (Palinkas, 2014).

Results

Quantitative Results

Upon data inspection within the study sample of 322 student athletes, responses provided by one participant was identified to be invalid with high scores in all of the positive and negative constructs. Four univariate outliners and six multivariate outliners were identified based on $|z| >$

3 and Mahalanobis D^2 larger than the critical value ($p < .001$), respectively (Tabachnick & Fidell, 2007). After removal of the outliers and invalid data, the final sample for data analyses was reduced to 311 participants (204 boys, 107 girls; $M_{age} = 15.59 \pm 1.22$ years)). A similar proportion of the boys (41.7%) and girls (38.3%) were varsity athletes, which provided the condition for multiple group analyses for meaningful comparisons across gender and team type in this study.

The final data showed univariate normality with |skewness| and |kurtosis| < 2 (Tabachnick & Fidell, 2007) and multivariate normality based on the approximate straight lines in the graphs of the MULTINOR analysis (Thompson, 1990). Missing data analyses revealed only 0.66% of the missing values across study variables; 39.5% of the sample had missing data while half of them missed only one item. The Little's missing completely at random (MCAR) test was shown to be significant, $\chi^2 (15587) = 16312.31$, $p < .001$, indicating that the missing data were not MCAR (R. J. A. Little, 1988), and further investigations of the missing patterns were warranted. One reason might be that the large number of survey items contributed to high degrees of freedom and a significant chi-square value.

A series of t-tests and chi-square tests of independence were conducted to examine whether significant differences existed between participants who had missing data and who did not. None of the t-test were significant ($p > .05$), indicating that the data were not missing due to certain motivational and psychosocial variables in the study. On the other hand, chi-square tests indicated that participants from one school had a significantly larger proportion of participants (53.4%) missing survey items than those from the other school (33.3%), $\chi^2 (1) = 5.585$, $p < .05$; the school with more missing responses had larger groups of participants doing the surveys at one time, and thus it was more prone to missing data. Additionally, a significantly larger

proportion of girls (53.3%) than boys (34.8%) had missing responses, $\chi^2(1) = 4.199$, $p < .05$.

After an in-depth item-by-item investigation of the missing pattern, it could be concluded the most missing responses were related to sport training information (3–5 % missing) that required simple calculations (e.g., number of sports played, hours of training), followed by items (about 3% missing) that were not very specific and could be hard for participants to understand and make judgments: "my coach gives most attention to the best athletes," "in my team, I feel supported," and "situations occur in which I am made to feel incapable." After the systematic investigation of the missing pattern, the conclusion of the missing data at random (MAR) was deemed appropriate based on several observed differences (Graham, 2009). Therefore, the expectation-maximization (EM) algorithm was employed to replace the missing values.

Preliminary Analyses

Cronbach's alphas of all subscale scores across groups in this study are displayed in Table 7. The study measures had good internal consistency ($\alpha > .70$; Nunally, 1978) in assessing the intended constructs across gender and team type. The only exceptions were the internal consistency of intra-team competition and relatedness support from peers for the girls ($\alpha s = .69$), and autonomy satisfaction for the girls ($\alpha = .68$) and the non-varsity athletes ($\alpha = .66$), although the Cronbach's alphas were still considered acceptable. Descriptive statistics and bivariate correlations for the study variables across gender and team type are presented in Tables 5 and 6, respectively. Based on the mean scores, both boys and girls, as well as varsity and non-varsity athletes, perceived greater positive social environments and motivational outcomes than the negative ones. The correlations were mostly significant and large enough for conducting further SEM analyses. The correlation coefficients also showed some interesting differences across

gender and team type, which provided evidence for multigroup SEM analyses in this study. Because the roles of the three social agents on satisfaction and frustration of the three psychological needs were one of the main study purposes, some differences regarding these relationships across groups were summarized here.

Table 7

Cronbach's Alpha of Subscale Scores across Gender and Team Type

Constructs	Overall	Boys	Girls	Varsity	Non-Varsity
Tasking-involving (coach)	.87	.84	.90	.85	.88
Autonomy support (coach)	.72	.71	.73	.73	.72
Social support (coach)	.76	.73	.80	.76	.76
Ego-involving (coach)	.85	.82	.87	.88	.83
Controlling (coach)	.82	.79	.90	.86	.82
Improvement (peer)	.86	.86	.86	.90	.84
Intra-team competition (peer)	.72	.71	.69	.70	.74
Relatedness support (peer)	.81	.73	.69	.75	.70
Intra-team conflict (peer)	.73	.76	.77	.75	.78
Effort (peer)	.78	.83	.77	.85	.78
Learning (parent)	.86	.86	.85	.82	.88
Worry-conducive (parent)	.84	.83	.85	.87	.81
Success without effort (parent)	.70	.74	.74	.77	.72
Autonomy satisfaction	.72	.74	.68	.78	.66
Competence satisfaction	.79	.78	.81	.76	.79
Relatedness satisfaction	.97	.85	.90	.88	.87
Autonomy frustration	.72	.81	.80	.82	.80
Competence frustration	.78	.79	.82	.78	.81
Relatedness frustration	.73	.76	.78	.72	.80
Intrinsic motivation	.90	.90	.90	.89	.90
Integrated regulation	.89	.88	.89	.85	.91
Identified regulation	.86	.86	.85	.83	.87
Introjected regulation	.80	.81	.78	.82	.78
External regulation	.84	.84	.86	.83	.85
Amotivation	.89	.87	.91	.89	.89
Subjective vitality	.90	.91	.89	.90	.90
Physical/Emotional exhaustion	.89	.87	.91	.89	.89
Reduced accomplishment	.77	.76	.78	.77	.76
Sport devaluation	.88	.86	.90	.89	.87
Intention to drop out	.92	.91	.88	.89	.91

Table 8

Descriptive Statistics and Bivariate Correlations for Study Variables among Boys and Girls

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	M	SD
1	Empowering	—	-.68**	.64**	-.34**	.05	-.13	.55**	.21*	.56**	-.57**	-.57**	-.52**	.23*	-.13	-.26**	.26**	-.47**	-.21*	3.84	0.69
2	Disempowering	-.21**	—	-.55**	.47**	-.01	.19*	-.48**	-.09	-.45**	.65**	.59**	.60**	-.12	.37**	.33**	-.11	.52**	.26**	2.70	0.84
3	Peer task	.60**	-.15*	—	-.45**	.09	-.12	.42**	.23*	.64**	-.43**	-.45**	-.49**	.18	-.27**	-.36**	.24*	-.48**	-.21*	5.28	0.99
4	Peer ego	.09	.43**	-.12	—	-.19*	.35**	-.23*	-.19	-.25**	.35**	.42**	.45**	-.14	.36**	.38**	-.16	.45**	.30**	3.83	1.01
5	Parent task	.45**	.00	.38**	.06	—	-.38**	.17	.31**	.15	-.05	-.12	-.07	.25*	-.07	-.23*	.35**	-.16	-.22*	3.89	0.68
6	Parent ego	-.22**	.32**	.00	.13	-.11	—	-.18	-.18	-.11	.22*	.32**	.24*	-.11	.27**	.24*	-.07	.23*	.21*	2.58	0.65
7	Autonomy S	.35**	-.32**	.22**	-.07	.18**	-.22**	—	.32**	.59**	-.57**	-.55**	-.47**	.36**	-.21*	-.41**	.32**	-.51**	-.29**	4.64	0.96
8	Competence S	.28**	.13	.20**	.12	.20**	-.09	.28**	—	.40**	-.09	-.22*	-.16	.45**	-.10	-.35**	.37**	-.38**	-.36**	4.95	1.04
9	Relatedness S	.49**	-.12	.45**	.02	.29**	-.07	.54**	.55**	—	-.44**	-.52**	-.49**	.39**	-.21*	-.36**	.39**	-.51**	-.27**	4.84	1.30
10	Autonomy F	-.18*	.46**	-.17*	.26**	.03	.11	-.41**	-.05	-.21**	—	.75**	.71**	-.24*	.31**	.40**	-.24*	.56**	.20*	3.44	1.37
11	Competence F	-.33**	.29**	-.25**	.12	-.15	.20**	-.53**	-.35**	-.55**	.62**	—	.78**	-.27**	.36**	.38**	-.30**	.59**	.18	3.25	1.37
12	Relatedness F	-.31**	.28**	-.19**	.07	-.18*	.13	-.48**	-.30**	-.55**	.47**	.69**	—	-.18	.37**	.38**	-.17	.49**	.12	3.07	1.30
13	Autonomous	.55**	-.03	.41**	.16*	.24**	-.22**	.34**	.46**	.48**	-.12	-.32**	-.25*	—	-.15	-.57**	.73**	-.62**	-.61**	5.15	1.30
14	Controlled	-.06	.49**	-.07	.31**	-.15*	.31**	-.34**	-.03	-.12	.37**	.31**	.30**	.01	—	.53**	-.12	.33**	.25**	3.26	1.42
15	Amotivation	-.31**	.37**	-.21**	.08	-.13	.29**	-.44**	-.25**	-.38**	.41**	.46**	.41**	-.45**	.53**	—	-.47**	.67**	.62**	2.79	1.64
16	Vitality	.50**	-.08	.36**	.10	.32**	-.14*	.39**	.41**	.43**	-.18*	-.29**	-.25**	.73**	-.17*	-.48**	—	-.60**	-.56**	4.87	1.40
17	Burnout	-.39**	.35**	-.28**	.14*	-.16*	.23**	-.55**	-.42**	-.45**	.49**	.61**	.49**	-.51**	.40**	.70**	-.60**	—	.59**	2.41	0.85
18	Dropout intention	-.49**	.23**	-.38**	.07	-.14*	.19**	-.40**	-.40**	-.42**	.30**	.40**	.31**	-.67**	.13	.51**	-.65**	.67**	—	2.35	1.75
	M	3.93	3.03	5.20	4.57	3.96	2.63	4.41	5.30	5.05	3.68	3.10	3.10	5.54	3.46	2.66	5.23	2.29	2.09	—	—
	SD	0.58	0.67	1.02	0.85	0.62	0.70	1.07	0.99	1.11	1.33	1.22	1.14	1.21	1.47	1.52	1.38	0.72	1.55	—	—

Note. Empowering = coach-created empowering climate; Disempowering = coach-created disempowering climate; Peer task = peer-created task-involving climate; Peer ego = peer-created ego-involving climate; Parent task = parent-created task-involving climate; Parent ego = parent-created ego-involving climate; S = satisfaction; F = frustration; Autonomous = autonomous motivation; Controlled = controlled motivation. Values below the diagonal represent the statistics for boys (n = 204); values above the diagonal represent the statistics for girls (n = 107). *p < .05. **p < 0.01.

Table 9

Descriptive Statistics and Bivariate Correlations for Study Variables among Varsity and Non-Varsity Athletes

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	M	SD
1	Empowering	—	−.38**	.63**	−.01	.20**	−.18*	.46**	.37**	.64**	−.35**	−.47**	−.44**	.47**	−.11	−.36**	.43**	−.48**	−.44**	3.87	0.64
2	Disempowering	−.46**	—	−.34**	.47**	.07	.20**	−.45**	.04	−.38**	.52**	.41**	.41**	−.02	.36**	.29**	−.01	.40**	.27**	2.81	0.70
3	Peer task	.57**	−.26**	—	−.26**	.22**	−.12	.35**	.27**	.59**	−.35**	−.42**	−.36**	.29**	−.20**	−.27**	.27**	−.35**	−.35**	5.24	0.98
4	Peer ego	−.18*	.46**	−.22*	—	.02	.14	−.10	.09	−.10	.34**	.24**	.20**	.16*	.21**	.05	.13	.18*	.08	4.16	0.97
5	Parent task	.45**	−.10	.37**	−.12	—	−.17*	.18*	.24**	.26**	.00	−.14	−.17*	.20**	−.15*	−.17*	.27**	−.12	−.11	3.91	0.68
6	Parent ego	−.20*	.34**	.06	.27**	−.27**	—	−.20*	−.18*	−.15*	.12	.20**	.15*	−.15*	.28**	.25**	−.07	.21**	.21**	2.57	0.63
7	Autonomy S	.35**	−.35**	.21*	−.25**	.17	−.22*	—	.22**	.53**	−.48**	−.46**	−.46**	.25**	−.33**	−.39**	.22**	−.48**	−.32**	4.46	0.92
8	Competence S	.06	.02	.13	−.13	.24**	−.09	.35**	—	.43**	−.07	−.26**	−.18*	.54**	−.05	−.36**	.43**	−.44**	−.49**	4.96	1.03
9	Relatedness S	.33**	−.12	.43**	−.05	.19*	−.02	.57**	.58**	—	−.38**	−.54**	−.52**	.42**	−.24**	−.41**	.39**	−.48**	−.39**	4.83	1.18
10	Autonomy F	−.29**	.56**	−.15	.25**	.00	.18*	−.45**	−.04	−.20*	—	.72**	.64**	−.16*	.34**	.39**	−.14	.51**	.24**	3.54	1.30
11	Competence F	−.36**	.42**	−.19*	.20*	−.13	.31**	−.62**	−.35**	−.52**	.59**	—	.74**	−.24**	.34**	.42**	−.26**	.59**	.32**	3.23	1.31
12	Relatedness F	−.31**	.44**	−.20*	.27**	−.06	.21*	−.52**	−.36**	−.54**	.45**	.71**	—	−.14	.33**	.40**	−.14	.47**	.21**	3.10	1.28
13	Autonomous	.33**	−.09	.37**	−.09	.34**	−.23**	.44**	.31**	.49**	−.16	−.41**	−.39**	—	.00	−.49**	.74**	−.56**	−.65**	5.31	1.34
14	Controlled	−.06	.53**	−.05	.45**	−.08	.31**	−.30**	−.13	−.06	.37**	.33**	.34**	−.14	—	.51**	−.11	.36**	.13	3.24	1.41
15	Amotivation	−.20*	.39**	−.26**	.34**	−.18*	.29**	−.46**	−.25**	−.35**	.41**	.46**	.41**	−.54**	.55**	—	−.45**	.65**	.56**	2.65	1.52
16	Vitality	.37**	−.15	.36**	−.12	.45**	−.17	.52**	.39**	.48**	−.27**	−.37**	−.35**	.72**	−.21**	−.53**	—	−.56**	−.56**	5.07	1.45
17	Burnout	−.34**	.41**	−.36**	.30**	−.23**	.25**	−.57**	−.38**	−.49**	.50**	.63**	.53**	−.56**	.39**	.75**	−.68**	—	.67**	2.34	0.75
18	Dropout intention	−.29**	.16	−.26**	.20*	−.28**	.16	−.39**	−.28**	−.33**	.28**	.31**	.26**	−.66**	.22*	.55**	−.71**	.61**	—	2.18	1.58
	M	3.93	3.08	5.20	4.54	3.98	2.68	4.53	5.50	5.18	3.68	3.04	3.06	5.54	3.61	2.79	5.16	2.32	2.18	—	—
	SD	0.60	0.79	1.05	0.93	0.59	0.75	1.19	0.92	1.15	1.42	1.22	1.07	1.10	1.50	1.62	1.32	0.79	1.69	—	—

Note. Empowering = coach-created empowering climate; Disempowering = coach-created disempowering climate; Peer task = peer-created task-involving climate; Peer ego = peer-created ego-involving climate; Parent task = parent-created task-involving climate; Parent ego = parent-created ego-involving climate; S = satisfaction; F = frustration; Autonomous = autonomous motivation; Controlled = controlled motivation. Values below the diagonal represent the statistics for varsity (n = 126); values above the diagonal represent the statistics for non-varsity (n = 185). *p < .05. **p < 0.01.

When comparing boys and girls, (a) the associations between need satisfaction and frustration and the social environments were stronger for girls (mostly large effect) than for boys (mostly moderate effect); (b) need satisfaction had stronger associations than need frustration with the social environments for boys, whereas need frustration had stronger associations than need satisfaction with the social environments for girls; and (c) satisfaction and frustration of all three basic psychological needs had stronger associations with the coach-created than peer-created than parent-created climates for boys, whereas those associations were relatively mixed for girls—need satisfaction was generally more associated with both coach-created and peer-created climates than parent-created climates, and need frustration was generally more associated with coach-created climates than peer-created and parent-created climates.

When comparing varsity and non-varsity athletes, (a) the associations between need satisfaction and frustration and the social environments were stronger for non-varsity athletes (moderate to large effect) than for varsity athletes (small to moderate effect); (b) need frustration had stronger associations than need satisfaction with the social environments for varsity athletes, whereas need satisfaction had stronger associations than need frustration (except competence) with the social environments for non-varsity athletes; and (c) satisfaction and frustration of all three psychological needs had stronger associations with the coach-created than peer-created than parent-created climates for both varsity and non-varsity athletes in general.

Confirmatory Factor Analyses

All nine overall CFA models achieved the criteria for adequate to good fit (CFI and TLI > .90, RMSEA and SRMR < .08; see Table 10), except for the RMSEA value in the model "intention to drop out." As previously mentioned in the methods section, RMSEA values are

inflated with small degrees of freedom (Kenny et al., 2015). Because the CFA model for "intention to drop out" had only one degree of freedom, it was considered as an adequate-fitting model with high CFI and TLI, as well as low SRMR values. Further, some models required modification by correlating the residual variances and/or removing some initial items due to low factor loadings. All factor structure and standardized factor loadings of the final overall models are presented through AMOS Graphics in Appendix G. All of the factor loadings were significant, ranging from good to excellent in magnitude (Comrey & Lee, 1992). Among the nine overall models, one was modified substantially: the whole intra-team competition/ability subscale was removed from the CFA model for the peer-created motivational climates. The first-order factor *intra-team competition/ability* loaded onto the second-order factor *ego-involving climate* in an opposite direction as what the theory suggests, which created a large degree of misfit in the model.

Measurement invariance testing showed that seven of the nine CFA models were configural and metric invariant (ΔCFI < –.005, ΔRMSEA < .010, ΔSRMR < .025) for both first- and second-order factor structure across gender and team type, although $\Delta\chi^2$ was significant in a few occasions without significant changes in any fit indices (see Table 11). Whereas no configural noninvariance was found, metric noninvariance of the first-order factor loadings was found in the CFA model for *need satisfaction* across team type ($\Delta\chi^2$ (12) = 27.33, p = .007; ΔCFI = –.008, ΔRMSEA = .001, ΔSRMR = .004) and *intention to drop out* across both gender ($\Delta\chi^2$ (4) = 13.64, p = .009; ΔCFI = –.008, ΔRMSEA = –.041, ΔSRMR = .015) and team type ($\Delta\chi^2$ (4) = 15.61, p = .004; ΔCFI = –.009, ΔRMSEA = –.024, ΔSRMR = .020). The factor loadings for autonomy satisfaction, competence satisfaction, and relatedness satisfaction were constrained across team type in three separate models, which indicated the measurement noninvariance

stemmed only from the autonomy satisfaction scale ($\Delta\chi^2$ (11) = 27.33, p = .007; ΔCFI = −.008, ΔRMSEA = .001, ΔSRMR = .004). After each factor loading of the autonomy satisfaction items was constrained to equal across groups, the last item "I couldn't play my sport very well" was found to be noninvariant across team type, $\Delta\chi^2$ (1) = 5.73, p = .017. Therefore, this item was removed for further invariance testing of the modified factor structure. The CFA models after modifications became configural and metric invariant (see Table 12).

After each factor loading of the items for *intention to drop out* was constrained to equal across groups, the last item "I intend to drop out of my sport at the end of the season" was found to be noninvariant across gender, $\Delta\chi^2$ (1) = 4.719, p = .03. After removal of this item, the CFA model was found to be metric invariant across team type (ΔCFI < −.005, ΔRMSEA < .010, ΔSRMR < .025) but not gender (ΔCFI = −.006, ΔRMSEA = .011, ΔSRMR = −.052; see Table 12). The factor loadings of each measurement item was constrained once again across gender, which indicated the measurement noninvariance stemmed from the second scale item "I plan to participate in my sport the next season," $\Delta\chi^2$ (1) = 6.75, p = .009. Because there were only three remaining items in the model, further removal of items would cause under-identification (Kline, 2016). Instead, this item was allowed to be freely estimated in the multigroup SEM across gender. Overall, partial measurement invariance was achieved in all of the individual latent constructs for model testing (Steenkamp & Baumgartner, 1998).

Model Testing

A total of 11 models using item-level indicators were tested (see Appendix H for a sample model), yet only one "brighter side" achieved the criteria for adequate fit in both measurement and structural models (CFI and TLI > .90, RMSEA and SRMR < .08; see Table

13). The comprehensive hypothesized model and the two proposed alternative models had poor

fit, which was most likely due to high degrees of freedom ranging from 3,000 to over 10,000 (T.

D. Little et al., 2013). In accordance, parcel-level modeling was performed for potential better-

fitting models. With reference to the model structure and fit indices of the item-level models,

seven initial parcel-item models were tested. The first three parcel-level models had identical

structures as the first three item-level structural models, while the other four parcel-models are

displayed in Appendix I.

The fit indices for the measurement models revealed that the four final models

concerning only the brighter or darker side achieved the criteria for adequate fit (CFI and TLI >

.90, RMSEA and SRMR < .08; see Table 14), although the three comprehensive models with

both the brighter and darker sides did not. The four adequate-fitting models consisted of most

latent constructs with good internal consistency in terms of composite reliability (CR > .70) and

construct validity (AVE > .50) as shown in Table 15. Only need satisfaction and frustration

constructs contained slightly lower CR (.69) and AVE (.46–.49), which were deemed acceptable,

especially since AVE cutoff is often too strict (Malhotra & Dash, 2011). In summary, the factor

loadings and interfactorcorrelations were significant and demonstrated the expected

relationships. However, the interfactorcorrelation in the "darker side" measurement model

indicated multicollinearity among the three need frustration, especially between competence and

relatedness frustration ($r > .90$). Therefore, the significance level of the path coefficients in the

structural models for the "darker side" would be changed to one-tailed α-level of .05 (i.e., $z =$

1.645) to account for the inflated Type II errors (Grewal, Cote, & Baumgartner, 2004; Kline,

2016).

Models 5 and 7 were chosen to be the final respective "brighter side" and "darker side" models for interpretation and further invariance testing, because one purpose of the study was to examine the roles of social agents on satisfaction and frustration of three distinct psychological needs. The initial hypothesized structural models did not provide an adequate fit, so modification indices were used, accompanied by theoretical grounds, to add additional paths in the models for estimation. The model fits improved to adequate after adding the direct paths from empowering climate to autonomous motivation, competence satisfaction to burnout, relatedness satisfaction to burnout, and parent-created task-involving climate to subjective vitality for the brighter side model (see Figure 5), and adding the direct paths from competence frustration to burnout, and peer-created ego-involving climate to intention to drop out for the darker side model (see Figure 6). The variance explained in the endogenous variables ranged from 8% to 87%, with the most variance explained in the motivational outcomes, particularly burnout, across the models. In terms of psychological needs and motivational regulations, relatedness satisfaction (46%) and autonomous motivation (41%) had the most variance explained in the "brighter side" model, while autonomy frustration (45%) and controlled motivation (32%) had the most variance explained in the "darker side" model.

All of the significant paths are shown in Figures 7 and 8 for the brighter side and darker side, respectively. Most of the paths were consistent with the hypothesized relationships. Yet, it was unexpected that autonomy satisfaction did not contributed significantly to any motivation types, while autonomy frustration had a positive direct effect on autonomous motivation. Among the three basic psychological needs, competence had the strongest effects on autonomous motivation, both positively through its satisfaction and negatively through its frustration. While competence frustration had the strongest positive effect on amotivation in the brighter side,

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relatedness had the strongest negative effect on amotivation in the darker side among the psychological needs. Furthermore, controlled motivation did not significantly predicted any of the three motivational outcomes in either the brighter or the darker side model. The bootstrapped 95% CI revealed that the majority of the indirect effects of the social environments on motivational regulations and motivational outcomes were significant, mostly through satisfaction and frustration of competence as well as relatedness (see Tables 13 and 14). Beyond these indirect effects, relatedness satisfaction had a negative direct effect and competence frustration had a positive direct effect on burnout, while parent-created task-involving climate had a positive direct effect on subjective vitality. Regarding the relationships among the social environments created by the three social agents, there were large positive associations between coach-created and peer-created climates, moderate positive associations between coach-created and parent-created climates, and small-to-moderate positive associations between peer-created and parent-created climates.

Comparing the roles of the three social agents, coach-created climates had significant effects on all need satisfaction and frustration, peer-created climates had significant effects only on relatedness satisfaction and competence frustration, and parent-created climates had significant effects on competence satisfaction, competence frustration, and relatedness frustration. With regard to the strengths of these relationships, coach-created climates had the strongest effects on athletes' three need satisfaction and autonomy frustration, peer-created ego-involving climate had the strongest effect on competence frustration, and parent created ego-involving climates had the strongest effect on relatedness frustration. Taken together, the positive social environments explained the most variance in satisfaction of relatedness, followed by

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autonomy and competence; the negative social environments explained the most variance in frustration of autonomy, followed by competence and relatedness.

Concerning the indirect effects of the social environments on motivational outcomes, coach-created empowering climates had the strongest positive effects on adaptive motivation and outcomes, including autonomous motivation ($c = 0.40$) and subjective vitality ($c = 0.84$), and the strongest negative effects on maladaptive motivation and outcomes, including amotivation ($c = -0.56$), burnout ($c = -0.48$), and dropout intention ($c = -0.64$). Conversely, coach-created disempowering climates had the strongest positive effect on burnout ($c = 0.20$) and negative effect on subjective vitality ($c = -0.22$), parent-created ego-involving climates had the strongest positive effects on amotivation ($c = 0.22$) and dropout intention ($c = 0.13$), as well as the strongest negative effect on autonomous motivation ($c = -.20$). Therefore, coaches had the strongest positive influence and parents had the strongest negative influence in the motivational processes in the overall sample of high school athletes.

With respect to the results of the multigroup SEM, invariance testing of the measurement models for Models 5 and 7 showed that they were configural and metric invariant (ΔCFI $< -.005$, ΔRMSEA $< .010$, ΔSRMR $< .025$), although some significant $\Delta\chi^2$ were observed in metric invariance across gender and team type (see Table 18). Structural invariance testing of the unconstrained models showed adequate fits for both the "brighter side" and "darker side" models for comparisons across gender and team type; although CFI and TLI values (tended to reject complex models) were just below .90, RMSEA and SRMR demonstrated acceptable values. Noninvariance of structural models (significant $\Delta\chi^2$) was found in both the "brighter side" and "darker side" models across gender, but only the "brighter side" model across team type. Thus, the motivational processes from social environments to motivational outcome varied across boys

and girls, which would be the focus of the group comparisons, rather than varsity and non-varsity athletes who differed mainly in positive motivational processes. Constraining each path coefficient one at a time showed that the significant $\Delta\chi^2$s were located in the paths from autonomous motivation to burnout and from amotivation to burnout. In addition to $\Delta\chi^2$ that might be influenced by the model complexity and other model factors (Marsh et al., 2004), z-scores were computed based on the differences in unstandardized estimates for comparing the path coefficients of two models using one-tailed α-level of .05 (i.e., $z = 1.645$).

Significant noninvariance existed in more paths across the "brighter side" models than the "darker side" models. Figures 9-12 show all of the significant paths for the brighter and darker side models in boys and girls, and Tables 16 and 17 demonstrate the significant differences in each path coefficient across gender. In terms of the roles of social agents in boys and girls, social environments created by coaches could contribute to greater positive effects on boys' motivational processes and greater negative effects on girls' ones. Specifically, empowering climates had significant positive effects on competence and relatedness satisfaction in boys, but not in girls, whereas disempowering climates had a significant positive effect on relatedness frustration in girls, but not in boys. Further, disempowering climates had a significant effect on competence frustration in girls ($\beta = .44$) twice stronger than in boys ($\beta = .22$). In contrast, social environments created by peers and parents could contribute to greater positive effects on girls' motivational processes and greater negative effects on boys' ones. Specifically, peer-created and parent-created task-involving climates had significant positive effects on relatedness and competence satisfaction, respectively, in girls but not in boys. Moreover, parent-created ego-involving climates had significant positive effect on competence and relatedness frustration in boys, but not in girls.

The indirect effects of the social environments on motivational outcomes for boys and girls had different strengths. Among the boys' perceived social environments created by the social agents, coach-created empowering climates had the strongest positive effects on adaptive motivation and outcomes, including autonomous motivation ($c = 0.46$) and subjective vitality ($c = 1.28$), and the strongest negative effects on maladaptive motivation and outcomes, including amotivation ($c = -0.77$), burnout ($c = -0.58$), and dropout intention ($c = -1.12$). Conversely, parent-created ego-involving climates had the strongest negative effects on boys' adaptive motivation and outcomes, including autonomous motivation ($c = -0.22$) and subjective vitality ($c = -0.26$), and the strongest positive effects on maladaptive motivation and outcomes, including amotivation ($c = 0.24$), burnout ($c = 0.18$), and dropout intention ($c = 0.15$).

On the other hand, among the girls' perceived social environments created by the social agents, the positive motivational influence was somewhat mixed from coaches, peers, and parents, as evidenced by the indirect effects on motivational outcomes. Peer-created task-involving climates had the strongest positive effect on autonomous motivation ($c = 0.77$) and the strongest negative effects on amotivation ($c = -0.61$) and burnout ($c = -0.22$); coach-created empowering climates had the strongest positive effect on subjective vitality ($c = 0.37$); parent-created task-involving climates had the strongest negative effect on dropout intention ($c = -0.18$). In the contrary, coach-created disempowering climates consistently had the strongest negative effects on girls' adaptive motivation and outcomes, including autonomous motivation ($c = -0.27$) and subjective vitality ($c = -0.26$), and the strongest positive effect on maladaptive motivation and outcomes, including amotivation ($c = 0.30$), burnout ($c = 0.32$), and dropout intention ($c = 0.17$). Additionally, peer-created task-involving climates had a significant negative direct effect on burnout in girls, but not in boys, while peer-created ego-involving climates had a

significant positive direct effect on dropout intention in boys, but not in girls. These direct and indirect effects further revealed the differences in the relative motivational influence of the social agents between boys and girls in this study.

Regarding the roles of social agents in varsity and non-varsity athletes' "brighter side" models, coach-created climates contributed to greater positive effects on the non-varsity athletes' motivational processes, and parent-created climates did so on the varsity athletes' ones. Specifically, empowering climates had significant positive effects on all three need satisfaction in non-varsity athletes, but not in varsity athletes, whereas parent-created task-involving climates had a significant positive effect on competence satisfaction in varsity athletes, but not in non-varsity athletes (see Table 21). In consideration of the basic psychological needs, competence satisfaction had the strongest positive effects on autonomous motivation in non-varsity athletes, whereas relatedness satisfaction did so in varsity athletes. Yet, these effects were not significant in the other group. Although relatedness satisfaction had the strongest negative effects on amotivation in both groups, competence satisfaction also had a significant negative effect on amotivation in non-varsity athletes, but not in varsity athletes. Thus, competence satisfaction had stronger influence in non-varsity athletes' than varsity athletes' motivation. Inspection of the path from motivation to outcomes revealed that amotivation had stronger effects on subjective vitality and dropout intention in varsity athletes than non-varsity athletes. Therefore, the negative influence of amotivation was more maladaptive in varsity athletes than non-varsity athletes.

Table 10

Fit Indices for Confirmatory Factor Analyses of Study Measures

Measure	χ^2	df	p	CFI	TLI	RMSEA	SRMR
EDMCQ–C	818.68	423	<.001	.909	.900	.055	.069
PeerMCSYQ	189.20	98	<.001	.961	.953	.055	.043
PIMCQ-2	193.34	98	<.001	.948	.936	.056	.067
Need satisfaction	189.08	74	<.001	.937	.922	.071	.062
PNTS	119.00	41	<.001	.948	.931	.078	.044
BRSQ	638.68	242	<.001	.920	.909	.073	.087
SVS	2.74	3	.433	1.000	1.001	.000	.008
ABQ	215.17	87	<.001	.946	.935	.069	.064
Dropout Intention	8.18	1	.004	.994	.963	.152	.008

Note. EDMCQ–C = Empowering and Disempowering Motivational Climate Questionnaire; PeerMCYSQ = Peer Motivational Climate in Youth Sport Questionnaire; PIMCQ-2 = Parent-Initiated Motivational Climate Questionnaire; PNTS = Psychological Need Thwarting Scale; BRSQ = Behavioral Regulation in Sport Questionnaire; SVS = Subjective Vitality Scale; ABQ = Athlete Burnout Questionnaire; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. The model fit indices were the values of the final model that might include removal of items from the original measures as shown in Appendix G.

Table 11

Fit Indices for Measurement Invariance Tests of Study Measures across Gender and Team Type

Measure	Group	Model	Invariance type	χ^2	df	$\Delta\chi^2$	Δdf	$p(\Delta\chi^2)$	CFI	TLI	RMSEA	SRMR	χ^2/df
EDMCQ–C	Gender	Model 1	Configural invariance	1079.10	710				.912	.900	.041	.077	1.52
		Model 2	Metric invariance (first-order factor loadings)	1111.31	734	32.21	24	.122	.910	.901	.041	.079	1.51
		Model 3	Metric invariance (first- and second-order factor loadings)	1124.83	739	13.52	5	.019	.908	.899	.041	.088	1.52
	Team type	Model 1	Configural invariance	1072.83	710				.914	.901	.041	.074	1.51
		Model 2	Metric invariance (first-order factor loadings)	1113.23	734	4.40	24	.019	.910	.900	.041	.084	1.52
		Model 3	Metric invariance (first- and second-order factor loadings)	1116.82	739	3.59	5	.610	.910	.901	.041	.086	1.51
PeerMCSYQ	Gender	Model 1	Configural invariance	293.27	196				.959	.950	.040	.047	1.50
		Model 2	Metric invariance (first-order factor loadings)	30.42	208	7.15	12	.848	.961	.955	.038	.049	1.44
		Model 3	Metric invariance (first- and second-order factor loadings)	304.31	212	3.89	4	.421	.961	.956	.038	.050	1.44
	Team type	Model 1	Configural invariance	333.79	196				.944	.931	.048	.051	1.70
		Model 2	Metric invariance (first-order factor loadings)	347.57	208	13.78	12	.315	.943	.934	.047	.055	1.67
		Model 3	Metric invariance (first- and second-order factor loadings)	352.71	212	5.14	4	.273	.942	.935	.046	.060	1.66
PIMCQ-2	Gender	Model 1	Configural invariance	334.30	190				.925	.905	.050	.080	1.76
		Model 2	Metric invariance (first-order factor loadings)	35.81	203	16.51	13	.223	.923	.909	.049	.078	1.73
		Model 3	Metric invariance (first- and second-order factor loadings)	353.56	206	2.75	3	.432	.923	.910	.048	.080	1.72
	Team type	Model 1	Configural invariance	336.58	190				.924	.904	.050	.075	1.77
		Model 2	Metric invariance (first-order factor loadings)	344.64	203	8.06	13	.840	.926	.913	.048	.080	1.70
		Model 3	Metric invariance (first- and second-order factor loadings)	355.91	206	11.27	3	.010	.922	.909	.041	.089	1.73
Need satisfaction	Gender	Model 1	Configural invariance	292.54	170				.937	.922	.048	.064	1.72
		Model 2	Metric invariance (first-order factor loadings)	306.20	182	13.66	12	.323	.936	.926	.047	.061	1.68
		Model 3	Metric invariance (first- and second-order factor loadings)	306.62	185	.42	3	.936	.937	.929	.046	.062	1.66

Measure	Group	Model	Invariance type	χ^2	df	$\Delta\chi^2$	Δdf	$p(\Delta\chi^2)$	CFI	TLI	RMSEA	SRMR	χ^2/df
													(table continues)
PNTS	Team type	Model 1	Configural invariance	297.49	170				.933	.917	.049	.075	1.75
		Model 2	Metric invariance (first-order factor loadings)	324.82	182	27.33	12	.007	.925*	.913	.050	.079	1.78
		Model 3	Metric invariance (first- and second-order factor loadings)	326.87	185	2.05	3	.562	.925	.915	.041	.086	1.77
	Gender	Model 1	Configural invariance	18.72	82				.936	.914	.062	.054	2.20
		Model 2	Metric invariance (first-order factor loadings)	194.80	90	14.08	8	.080	.932	.917	.061	.056	2.16
		Model 3	Metric invariance (first- and second-order factor loadings)	203.79	93	8.99	3	.029	.928	.915	.062	.070	2.19
	Team type	Model 1	Configural invariance	174.70	82				.940	.919	.060	.065	2.13
		Model 2	Metric invariance (first-order factor loadings)	184.51	90	9.81	8	.279	.938	.925	.058	.068	2.05
		Model 3	Metric invariance (first- and second-order factor loadings)	192.97	93	8.46	3	.037	.935	.923	.059	.087	2.07
BRSQ	Gender	Model 1	Configural invariance	851.62	458				.923	.907	.053	.093	1.86
		Model 2	Metric invariance (first-order factor loadings)	872.44	476	2.82	18	.289	.922	.910	.052	.093	1.83
		Model 3	Metric invariance (first- and second-order factor loadings)	882.54	482	1.10	6	.121	.921	.910	.052	.094	1.83
	Team type	Model 1	Configural invariance	813.40	458				.929	.915	.050	.086	1.78
		Model 2	Metric invariance (first-order factor loadings)	822.30	476	8.90	18	.962	.931	.920	.049	.086	1.73
		Model 3	Metric invariance (first- and second-order factor loadings)	845.54	482	23.24	6	<.001	.928	.917	.049	.095	1.75
SVS	Gender	Model 1	Configural invariance	8.11	6				.998	.993	.034	.015	1.35
		Model 2	Metric invariance (first-order factor loadings)	14.87	11	6.76	5	.239	.996	.993	.034	.021	1.35
	Team type	Model 1	Configural invariance	5.22	6				1.000	1.000	.000	.008	.87
		Model 2	Metric invariance (first-order factor loadings)	9.05	11	3.84	5	.573	1.000	1.000	.000	.018	.82
ABQ	Gender	Model 1	Configural invariance	344.25	174				.929	.914	.056	.072	1.98
		Model 2	Metric invariance (first-order factor loadings)	352.04	186	7.79	12	.801	.931	.922	.054	.073	1.89
		Model 3	Metric invariance (first- and second-order factor loadings)	357.53	189	5.49	3	.139	.930	.922	.054	.077	1.89

Measure	Group	Model	Invariance type	χ^2	df	$\Delta\chi^2$	Δdf	$p(\Delta\chi^2)$	CFI	TLI	RMSEA	SRMR	χ^2/df
	Team type	Model 1	Configural invariance	32.43	174				.939	.926	.052	.070	1.84
		Model 2	Metric invariance (first-order factor loadings)	333.16	186	12.73	12	.389	.938	.930	.051	.076	1.79
		Model 3	Metric invariance (first- and second-order factor loadings)	334.03	189	.87	3	.833	.939	.932	.050	.078	1.77
Dropout Intention	Gender	Model 1	Configural invariance	17.27	2				.987	.923	.157	.004	8.64
		Model 2	Metric invariance (first-order factor loadings)	3.91	6	13.64	4	.009	.979*	.958	.116	.019	5.15
	Team type	Model 1	Configural invariance	13.21	2				.991	.948	.135	.007	6.61
		Model 2	Metric invariance (first-order factor loadings)	28.82	6	15.61	4	.004	.982*	.965	.111	.027	4.80

Note. EDMCQ–C = Empowering and Disempowering Motivational Climate Questionnaire; PeerMCYSQ = Peer Motivational Climate in Youth Sport Questionnaire; PIMCQ-2 = Parent-Initiated Motivational Climate Questionnaire; PNTS = Psychological Need Thwarting Scale; BRSQ = Behavioral Regulation in Sport Questionnaire; SVS = Subjective Vitality Scale; ABQ = Athlete Burnout Questionnaire; $\Delta\chi^2$ = chi-square difference between nested models (i.e., Model 1 vs. Model 2 or Model 2 vs. Model 3); Δdf = difference in degrees of freedom; CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA = root mean squared error of approximation; SRMR = standardized root mean square residual. *ΔCFI < –.005 and $p(\Delta\chi^2)$ < .05 indicate measurement noninvariance.

Table 12

Fit Indices for Measurement Invariance Tests of Noninvariant Measures Before and After Modifications across Gender and Team Type

Measure	Group	Model	Invariance type	χ^2	df	$\Delta\chi^2$	Δdf	$p(\Delta\chi^2)$	CFI	TLI	RMSEA	SRMR	χ^2/df
Need satisfaction (after removal of one autonomy satisfaction item)	Gender	Model 1	Configural invariance	262.24	146				.937	.922	.041	.066	1.80
		Model 2	Metric invariance (first-order factor loadings)	275.85	157	13.61	11	.255	.936	.926	.049	.064	1.76
		Model 3	Metric invariance (first- and second-order factor loadings)	276.22	160	0.37	3	.946	.937	.929	.048	.064	1.73
	Team type	Model 1	Configural invariance	262.35	146				.933	.917	.049	.076	1.80
		Model 2	Metric invariance (first-order factor loadings)	281.28	157	18.93	11	.062	.930	.919	.051	.078	1.79
		Model 3	Metric invariance (first- and second-order factor loadings)	283.21	160	1.93	3	.587	.931	.921	.050	.083	1.77
Dropout intention (after removal of the last item)	Gender	Model 1	Configural invariance	8.72	2				.992	.977	.104	.059	4.36
		Model 2	Metric invariance (first-order factor loadings)	5.18	3	6.46	1	.011	.986*	.973	.115	.007	5.06
	Team type	Model 1	Configural invariance	1.09	2				.992	.976	.114	.015	5.05
		Model 2	Metric invariance (first-order factor loadings)	11.61	3	1.52	1	.218	.991	.983	.096	.034	3.87

Note. $\Delta\chi^2$ = chi-square difference between nested models (i.e., Model 1 vs. Model 2 or Model 2 vs. Model 3); Δdf = difference in degrees of freedom; CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA = root mean squared error of approximation; SRMR = standardized root mean square residual. *ΔCFI > –.005 and $p(\Delta\chi^2)$ < .05 indicate measurement noninvariance.

Table 13

Fit Indices for Item-Level Structural Models

Structural model	Model variables	χ^2	df	CFI	TLI	RMSEA	SRMR	χ^2/df
Item-level model 1	Brighter and darker sides	11544.07	6830	.693	.685	.058	.081	1.69
Item-level model 2	Brighter and darker sides	15258.14	8809	.674	.666	.060	.089	1.73
Item-level model 3	Brighter and darker sides	11311.30	6830	.794	.788	.046	.094	1.66
Item-level model 4	Brighter side	3445.68	2170	.894	.889	.044	.063	1.59
Item-level model 5	Brighter side	3515.40	2165	.888	.882	.045	.069	1.62
Item-level model 6	Brighter side	2572.96	1615	.910	.905	.044	.063	1.59
Item-level model 7	Brighter side	330.65	2169	.862	.855	.051	.072	1.52
Item-level model 8	Darker side	3689.72	2106	.865	.858	.049	.084	1.75
Item-level model 9	Darker side	3539.69	2097	.877	.870	.047	.075	1.69
Item-level model 10	Darker side	299.37	1677	.873	.866	.050	.085	1.78
Item-level model 11	Darker side	2804.16	1662	.889	.882	.047	.075	1.69

Note. CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA = root mean squared error of approximation; SRMR = standardized root mean square residual.

Table 14

Fit Indices for Parcel-Level Measurement and Structural Models

Structural model	χ^2	df	CFI	TLI	RMSEA	SRMR	χ^2/df
Parcel-level model 1: Brighter and darker sides with need satisfaction and frustration composites (first hypothesized model)							
Overall measurement model	1388.50	845	.912	.897	.056	.063	1.64
Overall structural model	1663.43	893	.875	.862	.065	.079	1.86
Parcel-level model 2: Brighter and darker sides with six separate need satisfaction and frustration							
Overall measurement model	Not positive definite matrices (Wothke, 1993)						
Parcel-level model 3: Brighter and darker sides with need satisfaction and frustration composites and without motivation							
Overall measurement model	1122.73	645	.899	.884	.060	.063	1.74
Parcel-level model 4: Brighter side with a need satisfaction composite							
Overall measurement model	844.45	385	.933	.919	.062	.066	2.19
Overall structural model	745.41	407	.925	.914	.064	.073	1.83
Parcel-level model 5: Brighter side with three separate need satisfaction (alternative hypothesized model as well as final model)							
Overall measurement model	1326.36	706	.927	.916	.053	.059	1.88
Overall structural model	1384.78	732	.923	.914	.054	.064	1.89
Parcel-level model 6: Darker side with a need frustration composite							
Overall measurement model	841.12	476	.920	.906	.061	.068	1.77
Overall structural model	874.09	490	.916	.904	.062	.071	1.78
Parcel-level model 7: Darker side with three separate need frustration (alternative hypothesized model as well as final model)							
Overall measurement model	1343.10	746	.928	.917	.051	.058	1.80
Overall structural model	1437.43	760	.918	.907	.054	.075	1.89

Note. CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA = root mean squared error of approximation; SRMR = standardized root mean square residual. Models 2 and 3 were not tested for structural models because the measurement model did not achieved an adequate fit

Table 15

Composite Reliability and Construct Validity across Adequate-Fitting Parcel-Level Models

Constructs	Model 4		Model 5		Model 6		Model 7	
	CR	AVE	CR	AVE	CR	AVE	CR	AVE
Empowering (coach)	.88	.72	.88	.72				
Disempowering (coach)					.87	.77	.88	.79
Tasking-involving (peer)	.88	.71	.88	.71				
Ego-involving (peer)					.77	.46	.78	.47
Tasking-involving (parent)	.83	.71	.83	.71				
Ego-involving (parent)					.82	.49	.83	.50
Need satisfaction	.73	.49						
Autonomy satisfaction			.73	.48				
Competence satisfaction			.69	.48				
Relatedness satisfaction			.87	.57				
Need frustration					.83	.63		
Autonomy frustration							.83	.55
Competence frustration							.80	.51
Relatedness frustration							.78	.54
Autonomous motivation	.87	.69	.88	.71	.89	.73	.87	.68
Controlled motivation	.79	.65	.79	.65	.79	.66	.79	.65
Amotivation	.88	.64	.88	.64	.87	.62	.88	.64
Subjective vitality	.90	.64	.90	.64	.90	.65	.89	.63
Athlete burnout	.82	.60	.79	.57	.78	.55	.80	.57
Intention to drop out	.71	.79	.71	.79	.71	.80	.71	.79

Note. CR = composite reliability; AVE = average variance extracted.

Table 16

Bootstrapped Tests for Indirect Effects in the Final Brighter Side Model (Model 5)

Indirect Paths	Standardized	Unstandardized	Lower CI	Upper CI	p
Empowering (coach) --> Competence S --> Autonomous	.10	0.20	0.053	0.460	.004
Empowering (coach) --> Competence S --> Autonomous --> Vitality	.09	0.19	0.049	0.472	.005
Empowering (coach) --> Competence S --> Autonomous --> Burnout	−.03	−0.05	−0.133	−0.009	.008
Empowering (coach) --> Competence S --> Autonomous --> Dropout	−.06	−0.14	−0.341	−0.033	.006
Empowering (coach) --> Relatedness S --> Amotivation	−.14	−0.38	−0.843	−0.088	.011
Empowering (coach) --> Relatedness S --> Amotivation --> Burnout	−.07	−0.09	−0.244	−0.018	.012
Task-involving (peer) --> Relatedness S --> Amotivation	−.09	−0.13	−0.328	−0.024	.013
Task-involving (peer) --> Relatedness S --> Amotivation --> Burnout	−.04	−0.03	−0.098	−0.005	.014
Task-involving (parent) --> Competence S --> Autonomous	.04	0.07	−0.004	0.242	**.067**

Table 17

Bootstrapped Tests for Indirect Effects in the Final Darker Side Model (Model 7)

Indirect Paths	Standardized	Unstandardized	Lower CI	Upper CI	p
Disempowering (coach) --> Autonomy F --> Autonomous	.17	0.27	0.059	0.858	.016
Disempowering (coach) --> Autonomy F --> Autonomous --> Vitality	.14	0.28	0.065	1.039	.015
Disempowering (coach) --> Autonomy F --> Autonomous --> Burnout	−.05	−0.06	−0.238	−0.012	.014

(table continues)

Indirect Paths	Standardized	Unstandardized	Lower CI	Upper CI	p
Disempowering (coach) --> Autonomy F --> Autonomous --> Dropout	–.10	–0.17	–0.634	–0.039	.015
Disempowering (coach) --> Competence F --> Autonomous	–.11	–0.24	–1.224	–0.017	.035
Disempowering (coach) --> Competence F --> Autonomous --> Vitality	–.09	–0.25	–1.804	–0.022	.032
Disempowering (coach) --> Competence F --> Autonomous --> Burnout	.03	0.05	0.005	0.536	.026
Disempowering (coach) --> Competence F --> Autonomous --> Dropout	.07	0.15	0.012	1.128	.031
Disempowering (coach) --> Competence F --> Amotivation	.09	0.26	0.006	1.249	.043
Disempowering (coach) --> Competence F --> Amotivation --> Burnout	.04	0.06	0.003	0.396	.034
Disempowering (coach) --> Competence F --> Burnout	.09	0.12	0.005	0.323	.044
Disempowering (coach) --> Relatedness F --> Autonomous	–.05	–0.07	–0.331	0.006	.071
Disempowering (coach) --> Relatedness F --> Amotivation	.05	0.21	–0.021	1.715	.081
Ego-involving (peer) --> Competence F --> Autonomous	–.17	–0.10	–0.286	0.061	**.137**
Ego-involving (peer) --> Competence F --> Amotivation	.14	0.11	–0.037	0.345	**.105**
Ego-involving (peer) --> Competence F --> Burnout	.14	0.05	–0.046	0.132	**.190**
Ego-involving (parent) --> Competence F --> Autonomous	–.11	–0.13	–0.329	–0.012	.033
Ego-involving (parent) --> Competence F --> Autonomous --> Vitality	–.09	–0.14	–0.343	–0.013	.033
Ego-involving (parent) --> Competence F --> Autonomous --> Burnout	.03	0.03	0.004	0.076	.024
Ego-involving (parent) --> Competence F --> Autonomous --> Dropout	.07	0.08	0.010	0.220	.028
Ego-involving (parent) --> Competence F --> Amotivation	.09	0.17	0.026	0.417	.013
Ego-involving (parent) --> Competence F --> Amotivation --> Burnout	.02	0.04	0.006	0.113	.010
Ego-involving (parent) --> Competence F --> Burnout	.09	0.07	0.003	0.146	.044
Ego-involving (parent) --> Relatedness F --> Autonomous	–.06	–0.07	–0.183	–0.011	.018
Ego-involving (parent) --> Relatedness F --> Autonomous --> Vitality	–.05	–0.07	–0.199	–0.012	.018
Ego-involving (parent) --> Relatedness F --> Autonomous --> Burnout	.02	0.01	0.002	0.040	.016

(table continues)

Indirect Paths	Standardized	Unstandardized	Lower CI	Upper CI	p
Ego-involving (parent) --> Relatedness F --> Autonomous --> Dropout	.04	0.04	0.007	0.113	.018
Ego-involving (parent) --> Relatedness F --> Amotivation	.06	0.08	0.014	0.214	.016
Ego-involving (parent) --> Relatedness F --> Amotivation --> Burnout	.03	0.02	0.003	0.059	.014

Note. F = frustration; Autonomous = autonomous motivation; Dropout = intention to drop out; Standardized = standardized indirect effect; Unstandardized = unstandardized indirect effect; CI = 95% confidence interval. Nonsignificant indirect effects are bolded.

Table 18

Fit Indices for Measurement Invariance and Structural Invariance Tests of the Final Models across Gender and Team Type

Group		Model type	χ^2	df	$\Delta\chi^2$	Δdf	$p(\Delta\chi^2)$	CFI	TLI	RMSEA	SRMR	χ^2/df
		Parcel-level model 5: Brighter side with three separate need satisfaction										
Gender	1	Measurement model with configural invariance	2193.21	1410				.911	.896	.042	.066	1.56
	2	Measurement model with metric invariance	2253.55	1451	60.34	41	.026	.909	.897	.042	.071	1.55
	3	Unconstrained measurement and structural model	2299.36	1462				.905	.893	.043	.071	1.57
	4	Baseline structural model with measurement invariance	2338.98	1490	39.62	28	.071	.903	.894	.043	.071	1.57
	5	Structural model with constrained structural weights	2409.15	1522	70.17	32	<.001	.899	.891	.043	.077	1.58
	6	Structural model with constrained structural covariances	2433.46	1528	24.31	6	<.001	.897	.889	.044	.077	1.59
Team type	1	Measurement model with configural invariance	2253.28	1410				.905	.890	.044	.078	1.60
	2	Measurement model with metric invariance	2328.95	1451	75.68	41	<.001	.901	.889	.044	.078	1.61
	3	Unconstrained measurement and structural model	2359.80	1462				.899	.887	.045	.082	1.61
	4	Baseline structural model with measurement invariance	2409.22	1490	49.42	28	.008	.897	.886	.045	.078	1.62
	5	Structural model with constrained structural weights	2463.99	1520	54.77	30	.004	.894	.886	.045	.091	1.62
	6	Structural model with constrained structural covariances	2476.55	1526	12.56	6	.051	.893	.885	.045	.094	1.62

(table continues)

Group		Model type	χ^2	df	$\Delta\chi^2$	Δdf	p($\Delta\chi^2$)	CFI	TLI	RMSEA	SRMR	χ^2/df
		Parcel-level model 7: Darker side with three separate need frustration										
Gender	1	Measurement model with configural invariance	2199.09	1474				.915	.900	.040	.069	1.49
	2	Measurement model with metric invariance	2260.68	1516	61.60	42	.026	.912	.900	.040	.070	1.49
	3	Unconstrained measurement and structural model	2398.73	1520				.896	.883	.043	.088	1.58
	4	Baseline structural model with measurement invariance	2446.85	1549	48.12	29	.014	.894	.882	.043	.087	1.58
	5	Structural model with constrained structural weights	2503.21	1580	56.36	31	.004	.891	.882	.043	.085	1.58
	6	Structural model with constrained structural covariances	2518.30	1586	15.09	6	.020	.890	.881	.044	.085	1.59
Team type	1	Measurement model with configural invariance	2248.34	1474				.911	.896	.041	.077	1.53
	2	Measurement model with metric invariance	2304.49	1516	56.15	42	.071	.909	.897	.041	.078	1.52
	3	Unconstrained measurement and structural model	2448.14	1520				.893	.879	.044	.092	1.61
	4	Baseline structural model with measurement invariance	2481.86	1549	33.72	29	.250	.892	.880	.044	.088	1.60
	5	Structural model with constrained structural weights	2522.09	1579	40.23	30	.100	.891	.881	.044	.090	1.60
	6	Structural model with constrained structural covariances	2531.81	1585	9.72	6	.137	.891	.881	.044	.092	1.60

Note. $\Delta\chi^2$ = chi-square difference between two nested measurement models (i.e., Models 1 & 2) or structural models (Models 3–6); Δdf = difference in degrees of freedom; CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA = root mean squared error of approximation; SRMR = standardized root mean square residual. p($\Delta\chi^2$) < .05 indicates structural noninvariance in comparison to the baseline model (Model 4).

Table 19

Path Coefficients in the Final Brighter Side Model of Boys and Girls

Paths			Boys (n = 204)			Girls (n = 107)			z
			β	b	p	β	b	p	
Empowering	-->	Autonomy S	.315	0.659	.023	.553	0.898	.002	0.576
Peer task	-->	Competence S	−.131	−0.161	.249	.159	0.183	.362	1.408
Parent task	-->	Relatedness S	.005	0.011	.950	.051	0.142	.458	0.512
Empowering	-->	Competence S	.386	0.948	.002	.128	0.214	.447	−1.751*
Empowering	-->	Relatedness S	.556	1.315	<.001	.184	0.394	.147	−2.369**
Peer task	-->	Autonomy S	−.015	−0.016	.902	−.028	−0.031	.877	−0.064
Peer task	-->	Relatedness S	.133	0.159	.190	.605	0.891	<.001	3.061***
Parent task	-->	Autonomy S	.131	0.230	.210	.034	0.071	.728	−0.581
Parent task	-->	Competence S	.048	0.099	.615	.236	0.514	.016	1.428
Autonomy S	-->	Autonomous	.059	0.062	.564	−.436	−0.518	.121	−1.652*
Competence S	-->	Autonomous	.258	0.230	.004	.408	0.471	.002	1.398
Relatedness S	-->	Autonomous	.160	0.147	.310	.820	0.740	.013	1.783*
Autonomy S	-->	Controlled	−.336	−0.413	.014	.164	0.233	.410	1.963**
Competence S	-->	Controlled	.130	0.136	.246	−.070	−0.097	.580	−1.104
Relatedness S	-->	Controlled	−.047	−0.052	.764	−.385	−0.414	.036	−1.386
Autonomy S	-->	Amotivation	−.230	−0.325	.055	.365	0.498	.072	2.538**
Competence S	-->	Amotivation	.015	0.018	.88	−.325	−0.431	.012	−2.154**
Relatedness S	-->	Amotivation	−.337	−0.421	.018	−.518	−0.537	.005	−0.446
Empowering	-->	Autonomous	.368	0.804	<.001	.253	0.489	.139	−0.801
Peer task	-->	Autonomous	.066	0.072	.436	−.530	−0.705	.042	−2.164**
Autonomous	-->	Vitality	.909	1.061	<.001	.886	0.905	<.001	−0.816
Autonomous	-->	Burnout	−.391	−0.242	<.001	−.436	−0.284	<.001	−0.456
Autonomous	-->	Dropout intention	−.742	−0.858	<.001	−.501	−0.449	<.001	2.337**
Controlled	-->	Vitality	−.229	−0.227	.025	.098	0.084	.321	2.359**
Controlled	-->	Burnout	.199	0.105	.040	−.052	−0.028	.538	−1.939*
Controlled	-->	Dropout intention	.058	0.057	.575	.023	0.017	.833	−0.307
Amotivation	-->	Vitality	.164	0.142	.180	.004	0.004	.978	−0.836
Amotivation	-->	Burnout	.437	0.200	<.001	.384	0.219	.002	0.210
Amotivation	-->	Dropout intention	.032	0.027	.796	.174	0.136	.264	0.673
Parent task	-->	Vitality	.082	0.175	.127	.183	0.470	.005	1.459
Competence S	-->	Burnout	−.185	−0.102	.002	−.111	−0.084	.152	0.272
Peer task	-->	Burnout	−.019	−0.013	.747	−.314	−0.273	<.001	−3.545***
Parent task	<-->	Empowering	.544	0.174	<.001	.124	0.042	.221	−2.880***
Peer task	<-->	Empowering	.694	0.369	<.001	.731	0.470	<.001	0.966
Parent task	<-->	Peer task	.420	0.267	<.001	.203	0.100	.079	−2.076**

Note. Empowering = coach-created empowering climate; Peer task = peer-created task-involving climate; Parent task = parent-created task-involving climate; S = satisfaction; Autonomous = autonomous motivation; Controlled = controlled motivation; β = standardized path coefficient; b = unstandardized path coefficient. *p < .05. **p < .01. ***p < .001.

Table 20

Path Coefficients in the Final Darker Side Model of Boys and Girls

Paths			Boys (n = 204)			Girls (n = 107)			z
			β	b	p	β	b	p	
Peer ego	-->	Competence F	.324	0.247	.004	.420	0.386	.003	0.880
Parent ego	-->	Relatedness F	.309	0.377	.002	.105	0.160	.259	−1.170
Disempowering	-->	Autonomy F	.493	1.090	<.001	.738	1.058	<.001	−0.101
Peer ego	-->	Autonomy F	.101	0.106	.329	.073	0.076	.569	−0.170
Disempowering	-->	Competence F	.028	0.108	.510	.474	0.607	.002	1.981**
Parent ego	-->	Competence F	.301	0.329	.002	.042	0.057	.646	−1.679*
Peer ego	-->	Relatedness F	.263	0.187	.049	.484	0.444	.003	1.458
Parent ego	-->	Autonomy F	−.011	−0.031	.813	.007	0.007	.957	0.204
Disempowering	-->	Relatedness F	−.034	0.046	.803	.337	0.508	.017	1.645
Competence F	-->	Controlled	.106	0.163	.345	.319	0.314	.209	0.496
Relatedness F	-->	Amotivation	.284	0.357	<.001	.330	0.377	.081	0.083
Autonomy F	-->	Autonomous	.193	0.185	.052	−.058	−0.057	.819	−0.902
Autonomy F	-->	Controlled	.178	0.141	.242	−.104	−0.125	.672	−0.834
Competence F	-->	Autonomous	−.359	−0.466	.002	−.374	−0.399	.054	0.265
Autonomy F	-->	Amotivation	.212	0.126	.282	−.099	−0.105	.704	−0.770
Competence F	-->	Amotivation	.206	0.443	.016	.316	0.352	.116	−0.311
Relatedness F	-->	Controlled	.036	0.043	.641	.199	0.251	.283	0.827
Relatedness F	-->	Autonomous	−.227	−0.238	.003	.096	0.104	.592	1.622
Parent ego	-->	Controlled	.183	0.270	.032	.054	0.093	.593	−0.830
Disempowering	-->	Controlled	.304	0.560	.001	.075	0.159	.599	−1.145
Autonomous	-->	Vitality	.867	0.982	<.001	.894	1.040	<.001	0.293
Autonomous	-->	Burnout	−.311	−0.173	<.001	−.396	−0.258	<.001	−1.026
Autonomous	-->	Dropout intention	−.607	−0.691	<.001	−.499	−0.441	<.001	1.468
Controlled	-->	Vitality	−.145	−0.136	.106	.073	0.082	.469	1.547
Controlled	-->	Burnout	.054	0.018	.674	−.168	−0.090	.130	−1.468
Controlled	-->	Dropout intention	−.117	−0.120	.185	.042	0.034	.729	1.155
Amotivation	-->	Vitality	.050	0.039	.680	−.015	−0.026	.865	−0.359
Amotivation	-->	Burnout	.482	0.216	<.001	.442	0.262	<.001	0.513
Amotivation	-->	Dropout intention	.137	0.126	.191	.170	0.135	.312	0.052
Competence F	-->	Burnout	.354	0.238	<.001	.448	0.291	<.001	0.760
Peer ego	-->	Dropout intention	.258	0.255	<.001	−.033	−0.030	.692	−2.939***
Parent ego	<-->	Disempowering	.419	0.273	<.001	.257	0.198	.030	−0.684
Peer ego	<-->	Disempowering	.567	0.533	<.001	.726	0.950	<.001	1.941*
Parent ego	<-->	Peer ego	.166	0.204	.058	.322	0.395	.013	0.995

Note. Disempowering = coach-created disempowering climate; Peer ego = peer-created ego-involving climate;
Parent ego = parent-created ego-involving climate; F = frustration; Autonomous = autonomous motivation;
Controlled = controlled motivation. β = standardized path coefficient; b = unstandardized path coefficient. *p < .05.
**p < .01. ***p < .001.

Table 21

Path Coefficients in the Final Brighter Side Model of Varsity and Non-Varsity Athletes

Paths			Varsity (n = 126)			Non-varsity (n = 185)			z
			β	b	p	β	b	p	
Empowering	-->	Autonomy S	.246	0.530	.113	.504	0.815	<.001	0.693
Peer task	-->	Competence S	.112	0.136	.411	–.169	–0.204	.187	–1.501
Parent task	-->	Relatedness S	.087	0.239	.455	.072	0.142	.252	–0.284
Empowering	-->	Competence S	–.126	–0.286	.378	.488	1.002	<.001	3.065***
Empowering	-->	Relatedness S	.153	0.368	.262	.593	1.296	<.001	2.317**
Peer task	-->	Autonomy S	–.004	–0.004	.980	.020	0.019	.887	0.108
Peer task	-->	Relatedness S	.356	0.454	.008	.223	0.286	.025	–0.788
Parent task	-->	Autonomy S	.159	0.393	.228	.048	0.070	.597	–0.918
Parent task	-->	Competence S	.281	0.734	.024	.149	0.277	.067	–1.277
Autonomy S	-->	Autonomous	.116	0.100	.386	–.119	–0.165	.292	–1.363
Competence S	-->	Autonomous	–.205	–0.166	.185	.448	0.487	<.001	4.263***
Relatedness S	-->	Autonomous	.647	0.499	.004	.222	0.226	.126	–1.200
Autonomy S	-->	Controlled	–.294	–0.316	.086	–.083	–0.119	.565	0.709
Competence S	-->	Controlled	–.103	–0.105	.541	.103	0.117	.285	1.089
Relatedness S	-->	Controlled	.197	0.190	.394	–.331	–0.354	.020	–2.015**
Autonomy S	-->	Amotivation	–.166	–0.227	.257	–.038	–0.058	.769	0.601
Competence S	-->	Amotivation	.159	0.206	.281	–.224	–0.267	.011	–2.167**
Relatedness S	-->	Amotivation	–.499	–0.613	.014	–.350	–0.391	.008	0.767
Empowering	-->	Autonomous	.111	0.206	.217	.228	0.508	.031	1.044
Peer task	-->	Autonomous	.906	1.096	<.001	.965	0.978	<.001	–0.550
Autonomous	-->	Vitality	–.303	–0.257	.013	–.551	–0.310	<.001	–0.458
Autonomous	-->	Burnout	–.938	–1.017	<.001	–.619	–0.635	<.001	1.559
Autonomous	-->	Dropout intention	–.167	–0.162	.180	–.158	–0.153	.115	0.055
Controlled	-->	Vitality	–.115	–0.078	.337	.198	0.107	.047	1.895*
Controlled	-->	Burnout	.249	0.216	.116	–.019	–0.019	.848	–1.391
Controlled	-->	Dropout intention	.149	0.113	.380	.221	0.204	.094	0.515
Amotivation	-->	Vitality	.715	0.381	<.001	.248	0.127	.047	–2.282**
Amotivation	-->	Burnout	–.406	–0.276	.064	.189	0.177	.149	2.347**
Amotivation	-->	Dropout intention	.245	0.630	<.001	.127	0.260	.018	–1.774*
Parent task	-->	Vitality	–.093	–0.068	.216	–.174	–0.135	.008	–0.902
Competence S	-->	Burnout	.488	0.120	<.001	.269	0.105	.003	–0.322
Peer task	-->	Burnout	.662	0.353	<.001	.730	0.438	<.001	0.928
Parent task	<-->	Empowering	.428	0.199	<.001	.265	0.176	.003	–0.275
Peer task	<-->	Empowering	.246	0.530	.113	.504	0.815	<.001	0.693
Parent task	<-->	Peer task	.112	0.136	.411	–.169	–0.204	.187	–1.501

Note. Empowering = coach-created empowering climate; Peer task = peer-created task-involving climate; Parent task = parent-created task-involving climate; S = satisfaction; Autonomous = autonomous motivation; Controlled = controlled motivation; β = standardized path coefficient; b = unstandardized path coefficient. *p < .05. **p < .01. ***p < .001.

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Table 22

Coexistence of Codes in Social Environments and Basic Psychological Needs within Meaning Units

	Empowering climate (coach)	Disempowering climate (coach)	Positive climate (peer)	Negative climate (peer)	Positive climate (parents)	Negative climate (parents)
Autonomy satisfaction	0	0	0	0	0	0
Competence satisfaction	2	0	0	0	1	0
Relatedness satisfaction	1	1	6	0	3	0
Autonomy frustration	0	4	0	0	0	4
Competence frustration	0	5	0	0	0	1
Relatedness frustration	0	1	0	2	0	0

Table 23

Comparisons of Codes across Gender, Team Type, and Dropout Likelihood

Code	Boys (n = 24)	Girls (n = 13)	Varsity (n = 13)	JV (n = 13)	Freshman (n = 9)	Higher dropout likelihood (n = 18)	Lower dropout likelihood (n = 19)
Empowering climate (coach)	32	19	17	14	18	19	33
Disempowering climate (coach)	48	49	32	51	16	51	49
Empowering vs. Disempowering	0.67	0.39	0.53	0.27	1.13	0.37	0.67

(table continues)

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Code	Boys (n = 24)	Girls (n = 13)	Varsity (n = 13)	JV (n = 13)	Freshman (n = 9)	Higher dropout likelihood (n = 18)	Lower dropout likelihood (n = 19)
Positive climate (peer)	17	21	16	6	13	20	19
Negative climate (peer)	33	16	6	22	20	23	26
Positive vs. Negative	0.52	1.31	2.67	0.27	0.65	0.87	0.73
Positive climate (parent)	25	13	14	13	9	19	19
Negative climate (parent)	25	6	16	10	5	13	18
Positive vs. Negative	1.00	2.17	0.88	1.30	1.80	1.46	1.06
Most positive influence: coaches	7	4	4	4	3	2	9
Most positive influence: teammates	4	8	6	4	2	5	8
Most positive influence: parents	9	4	4	5	4	8	5
Most negative influence: coaches	4	6	6	4	1	7	4
Most negative influence: teammates	13	2	2	7	6	6	9
Most negative influence: parents	0	1	0	1	0	0	1
Autonomy satisfaction	0	0	0	0	0	0	0
Competence satisfaction	7	4	8	2	1	7	4
Relatedness satisfaction	22	5	20	3	3	15	12
Autonomy frustration	14	7	13	7	1	11	10
Competence frustration	11	9	5	9	6	9	11
Relatedness frustration	15	3	5	11	2	8	10
Satisfaction vs. Frustration	0.73	0.47	1.22	0.19	0.44	0.79	0.52
Underinvolvement (parent)	4	6	2	5	3	4	6
Moderate Involvement (parent)	11	4	4	4	6	6	9
Overinvolvement (parent)	7	3	6	3	1	5	5

Note. Empowering vs. Disempowering, Positive vs. Negative, and Satisfaction vs. Frustration represent the ratio between two codes.

Table 24

Mixed-Methods Comparisons of Relative Influence of Three Social Agents

Agent	Overall	Boys	Girls	Varsity	Non-varsity
Coach (Quan)	Most positive and most negative influence in three need satisfaction and autonomy frustration	Positive influence in competence and relatedness satisfaction; Most positive influence in the outcomes	Negative influence in competence and relatedness frustration	Most negative in autonomy frustration	Most positive and most negative influence in three need satisfaction and autonomy frustration
Coach (Qual)	More negative than positive influence, especially in autonomy frustration	More negative than positive influence	More negative than positive influence	More negative than positive influence	More negative than positive influence for JV; more positive than negative influence for freshman
Peer (Quan)	Most negative influence in competence frustration	Negative influence in dropout intention	Positive influence in competence and relatedness satisfaction	The only positive influence in relatedness satisfaction; Most negative influence in competence frustration	Most negative influence in competence frustration
Peer (Qual)	More negative than positive influence	More negative than positive influence, especially in competence frustration	More positive than negative influence	More positive than negative influence, especially in relatedness satisfaction	More negative than positive influence, especially in JV
Parent (Quan)	Most negative influence in relatedness frustration	Negative influence in competence and relatedness frustration; Most positive in outcomes	Positive influence in competence and relatedness satisfaction	The only positive influence in competence satisfaction	Most negative influence in relatedness frustration

(table continues)

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Agent	Overall	Boys	Girls	Varsity	Non-varsity
Parent (Qual)	More positive than negative influence	Similar positive and negative influence	More positive than negative influence, especially in competence satisfaction	More negative than positive influence	More positive than negative influence, especially for freshman
Relative influence (Quan)	Positive: Empowering climates, parent task, peer task Negative: Parent ego, disempowering, peer ego	More vulnerable than girls in ego-involving cues from peers and parents who can thwart competence and relatedness	More vulnerable than boys to controlling and ego-involving behaviors of coaches who can thwart autonomy and relatedness	Invariant across varsity and non-varsity athletes	Invariant across varsity and non-varsity athletes
Relative influence (Qual)	Positive: Teammates, parents, coaches Negative: Teammates, coaches, parents	Positive: Parents, coaches, teammates Negative: Teammates, coaches, parents	Positive: Teammates, parents/coaches Negative: Coaches, teammates, parents	Positive: Teammates, parents/coaches Negative: Coaches, teammates, parents	Positive: Parents, coaches, teammates Negative: Teammates, coaches, parents

Note. Quan = quantitative; Qual = qualitative.

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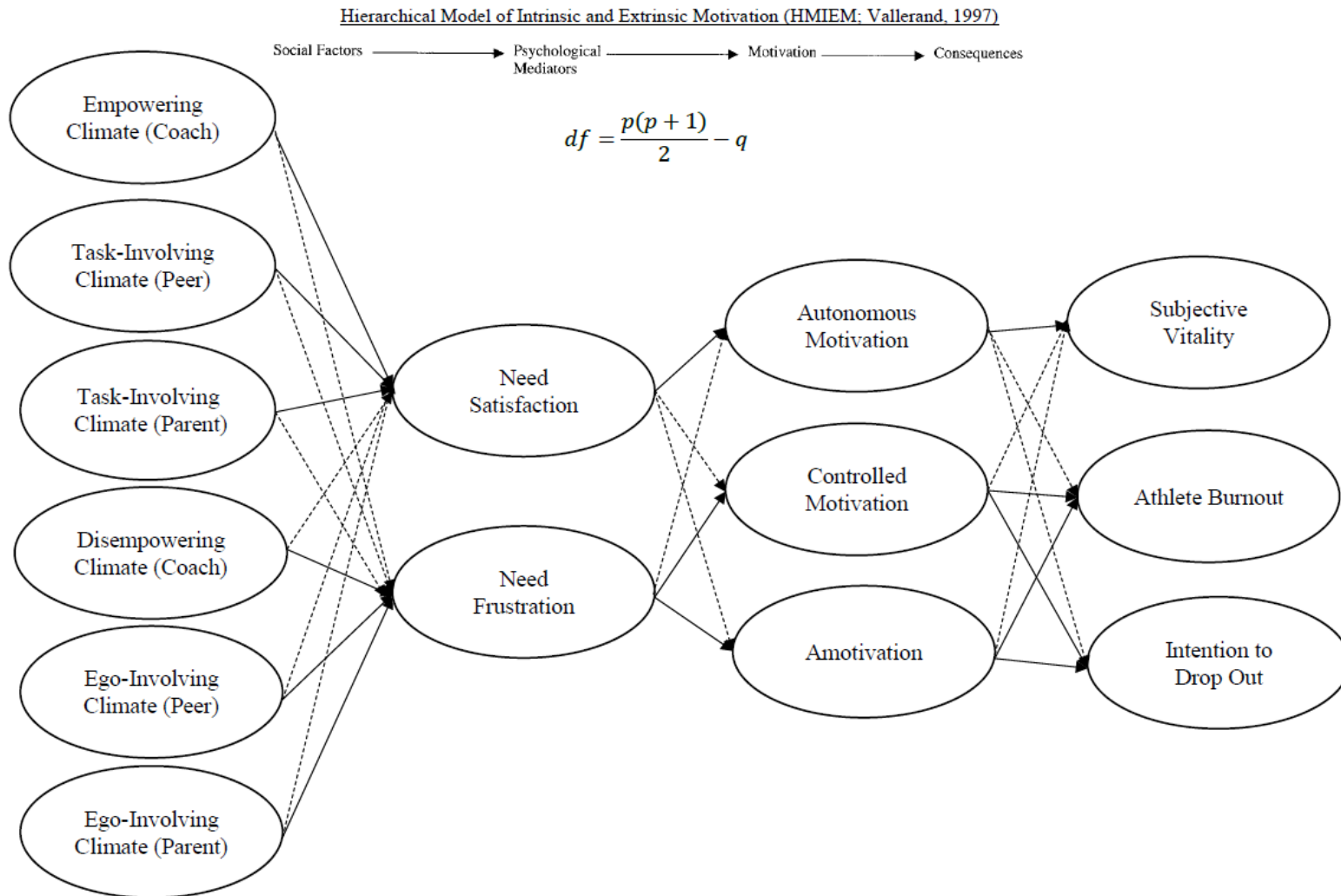
Figure 2. Hypothesized "brighter and darker sides" model for testing relationships among study variables. Solid lines represent positive relationships; dashed lines represent negative relationships.

Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM; Vallerand, 1997)

Social Factors → Psychological Mediators → Motivation → Consequences

$$df = \frac{p(p+1)}{2} - q$$
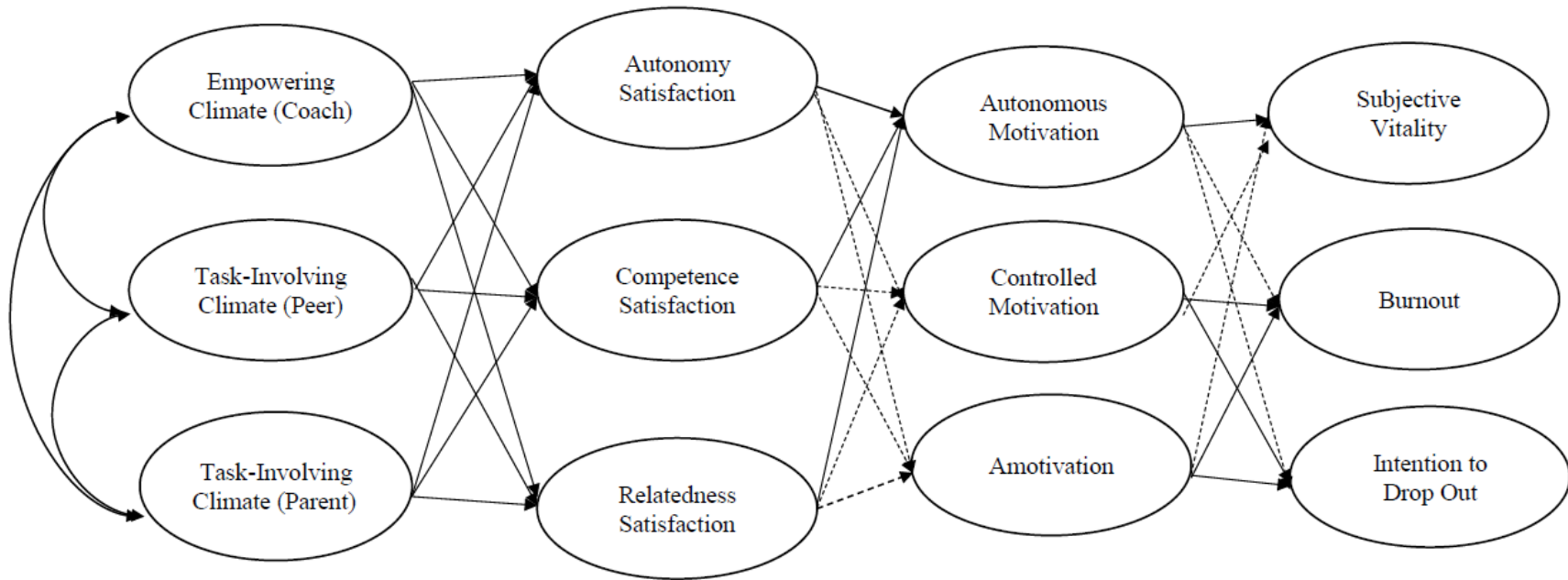
Figure 3. Alternative hypothesized "brighter side" model for testing relationships among study variables. Solid lines represent positive relationships; dashed lines represent negative relationships.

Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM; Vallerand, 1997)

Social Factors ⟶ Psychological Mediators ⟶ Motivation ⟶ Consequences

$$df = \frac{p(p+1)}{2} - q$$
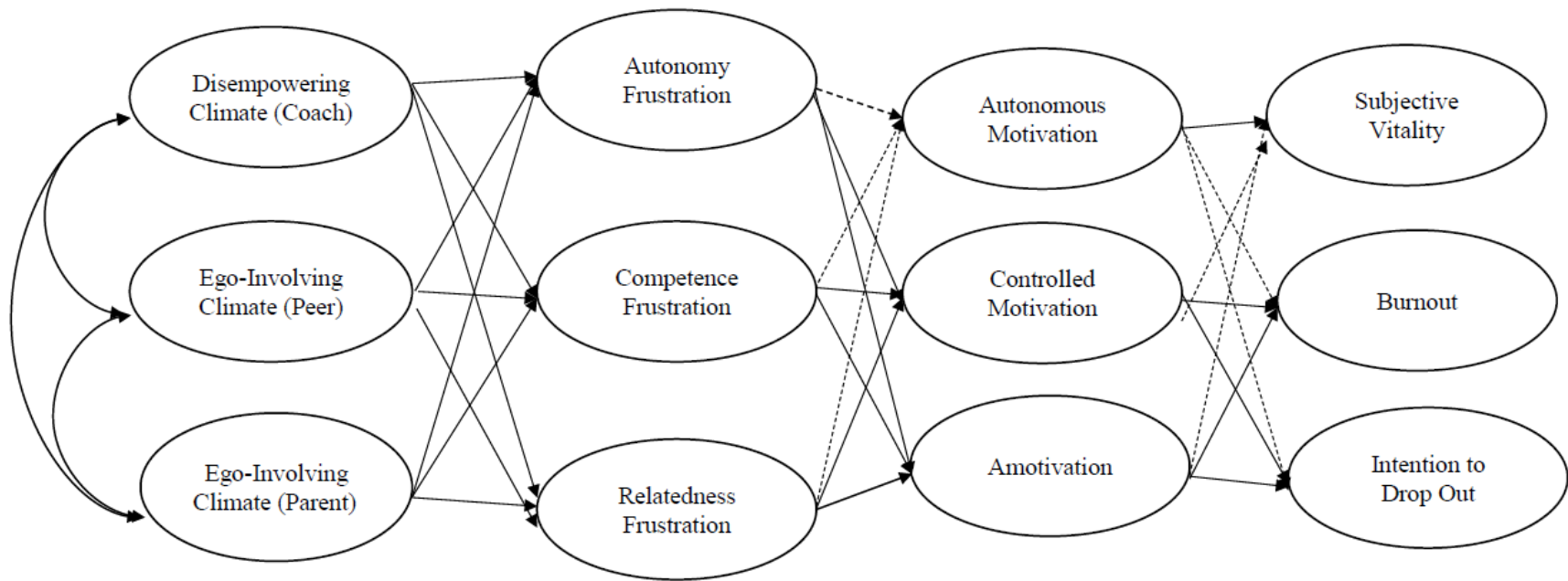
Figure 4. Alternative hypothesized "darker side" model for testing relationships among study variables. Solid lines represent positive relationships; dashed lines represent negative relationships.

Figure 5. Modified "brighter side" model for testing relationships among study variables with added paths based on modification indices. Solid lines represent positive relationships; dashed lines represent negative relationships.

Social Factors ⟶ Psychological Mediators ⟶ Motivation ⟶ Consequences

$$df = \frac{p(p+1)}{2} - q$$
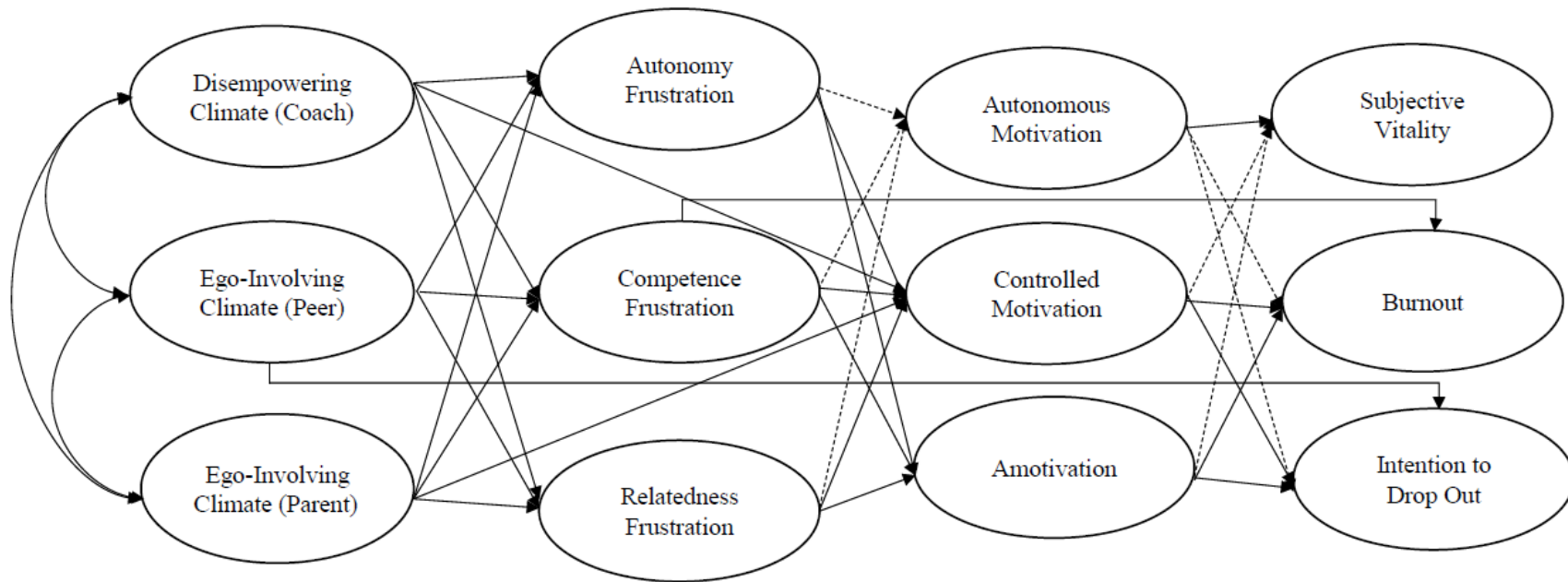
Figure 6. Modified "darker side" model for testing relationships among study variables with added paths based on modification indices. Solid lines represent positive relationships; dashed lines represent negative relationships.

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Social Factors ⟶ Psychological Mediators ⟶ Motivation ⟶ Consequences
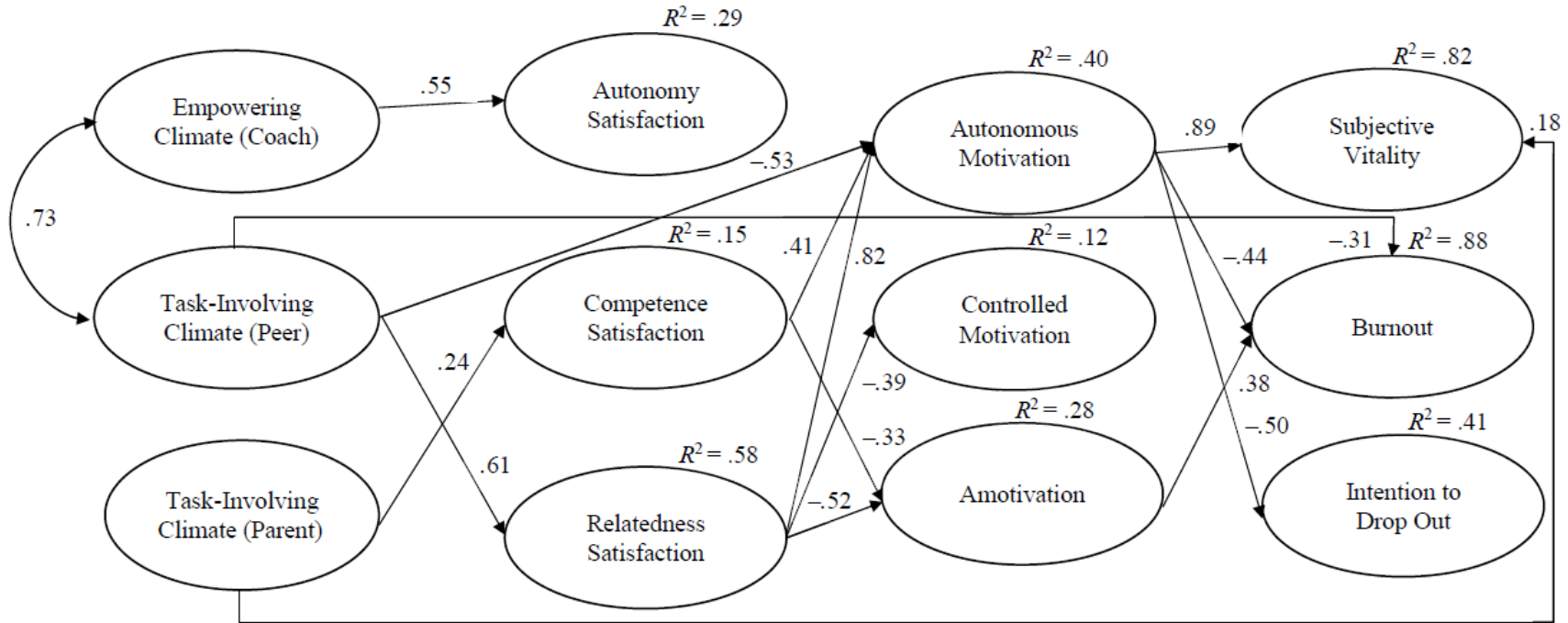
$df = 732$
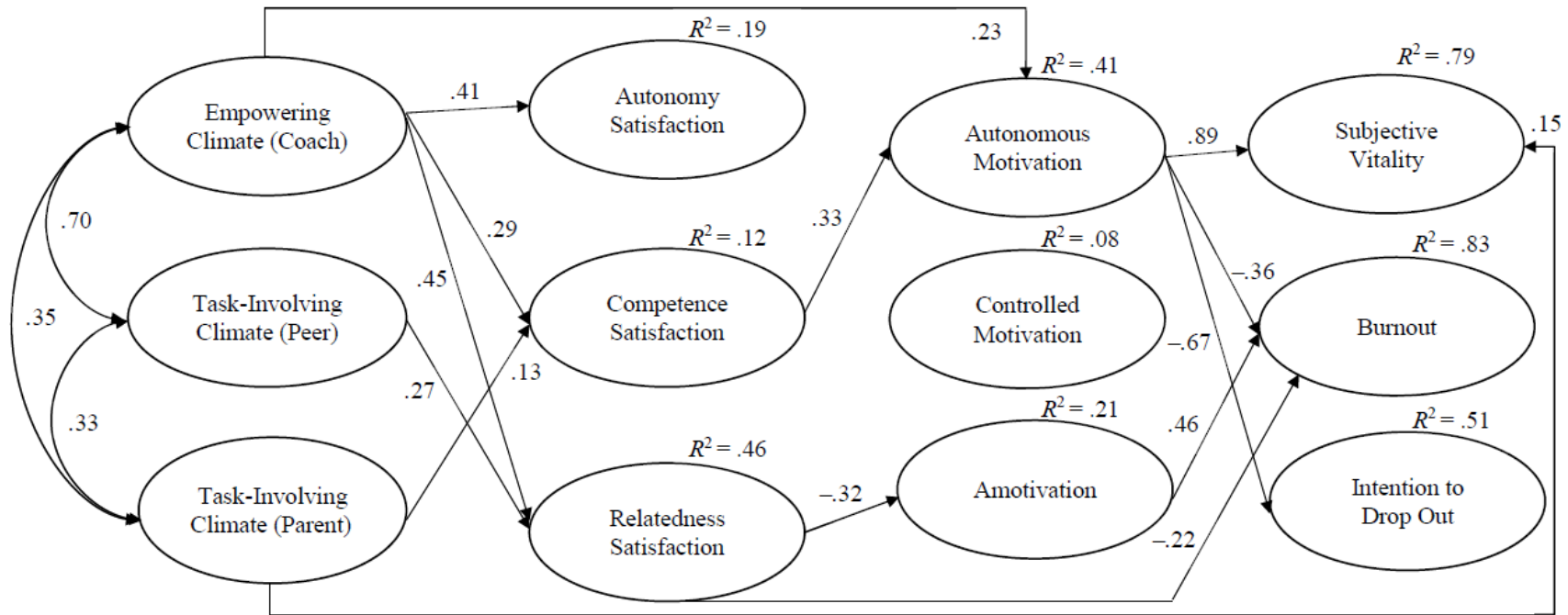
Figure 7. Overall "brighter side" model for effects of positive social environments and need satisfaction on motivational outcomes. Only significant paths and associated standardized coefficients ($z > 1.96$) are shown in the model. Residual variances existed, though not shown in the figure for simplicity.

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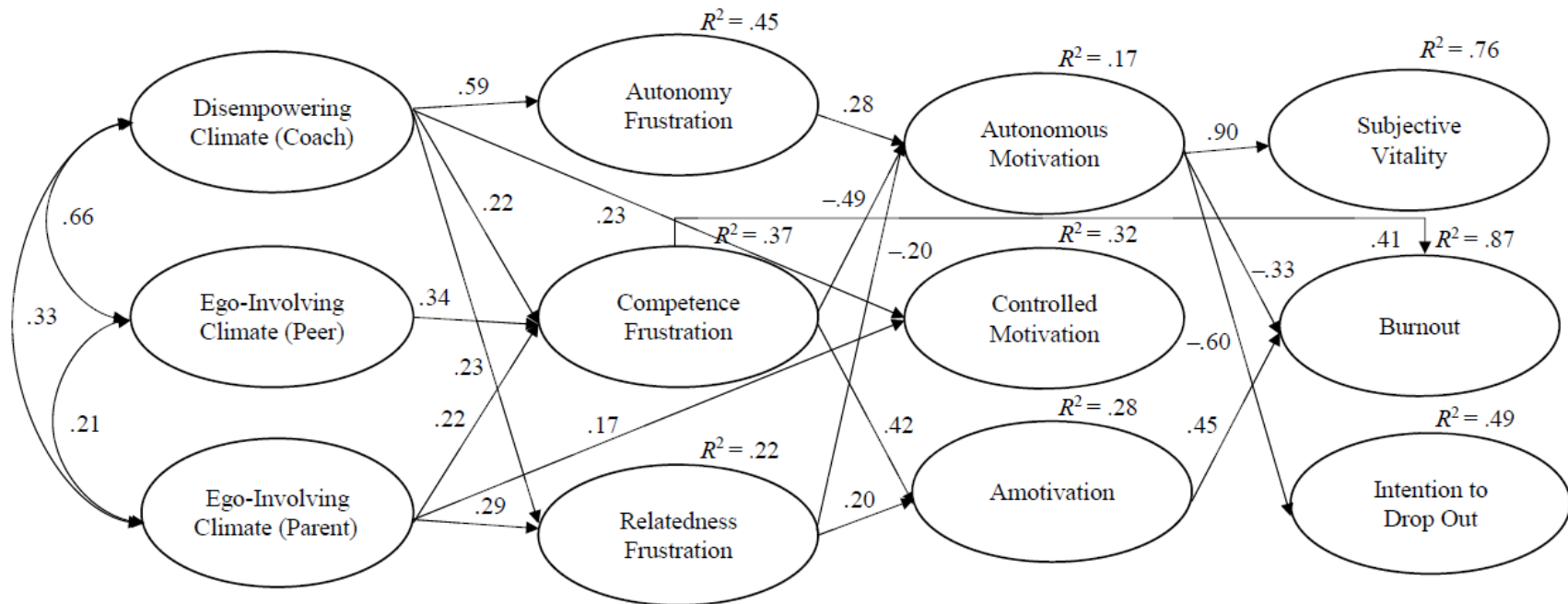
Figure 8. Overall "darker side" model for effects of positive social environments and need satisfaction on motivational outcomes. Only significant paths and associated standardized coefficients ($z > 1.96$) are shown in the model. Residual variances existed, though not shown in the figure for simplicity.
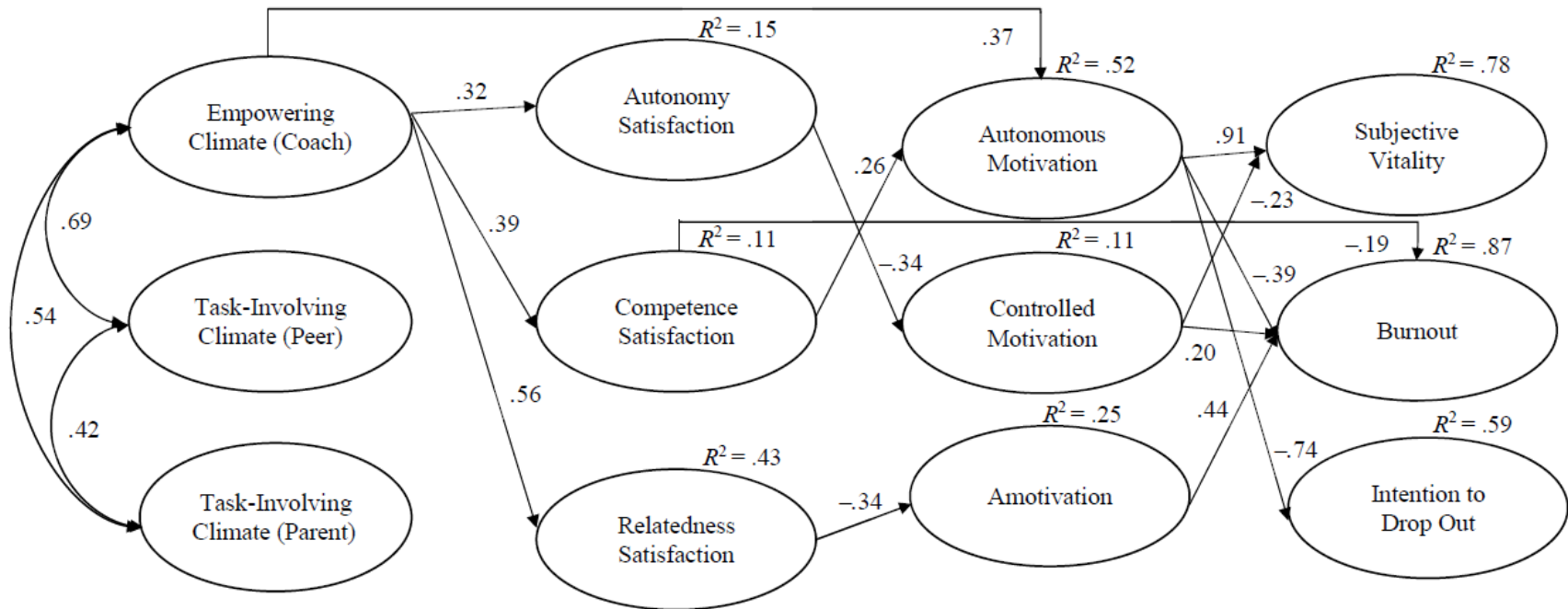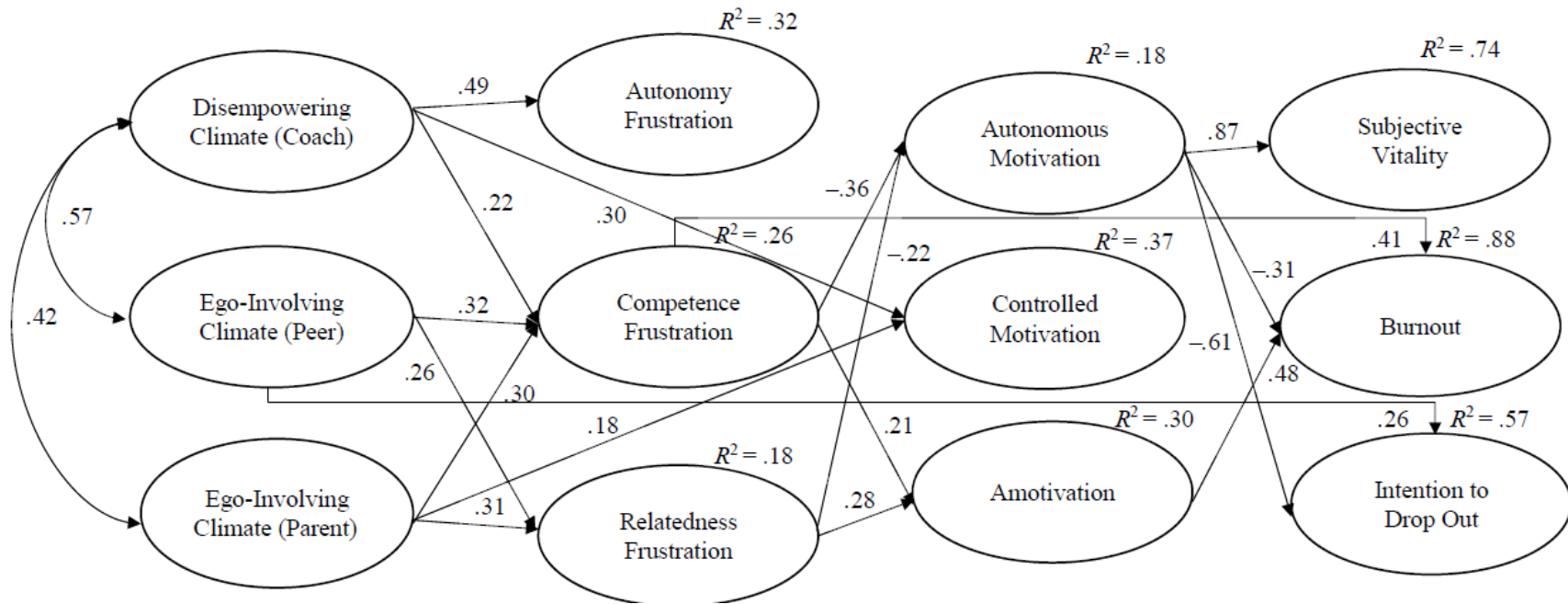
Figure 9. Boys' "brighter side" model for effects of positive social environments and need satisfaction on motivational outcomes. Only significant paths and associated standardized coefficients ($z > 1.96$) are shown in the model. Residual variances existed, though not shown in the figure for simplicity.

Social Factors ———————→ Psychological ———————→ Motivation ———————→ Consequences
                                Mediators

$df = 734$

Figure 10. Girls' "brighter side" model for effects of positive social environments and need satisfaction on motivational outcomes. Only significant paths and associated standardized coefficients ($z > 1.96$) are shown in the model. Residual variances existed, though not shown in the figure for simplicity.

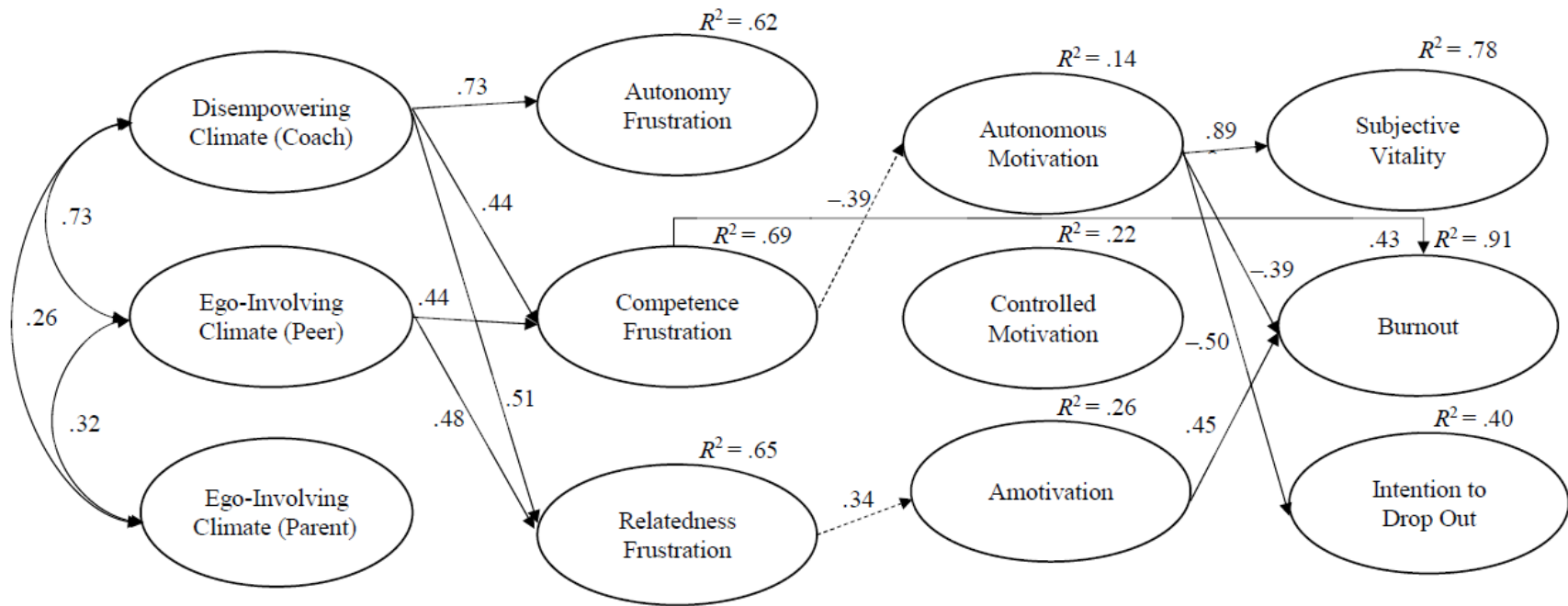Social Factors → Psychological Mediators → Motivation → Consequences

$df = 760$

Figure 11. Boys' "darker side" model for effects of positive social environments and need satisfaction on motivational outcomes. Only significant paths and associated standardized coefficients ($z > 1.96$) are shown in the model. Residual variances existed, though not shown in the figure for simplicity.

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Figure 12. Girls' "darker side" model for effects of positive social environments and need satisfaction on motivational outcomes. Only significant paths and associated standardized coefficients ($z > 1.96$ for solid lines; $z > 1.645$ for dashed lines to adjust for inflated Type II errors from multicollinearity) are shown in the model. Residual variances existed, though not shown in the figure for simplicity.
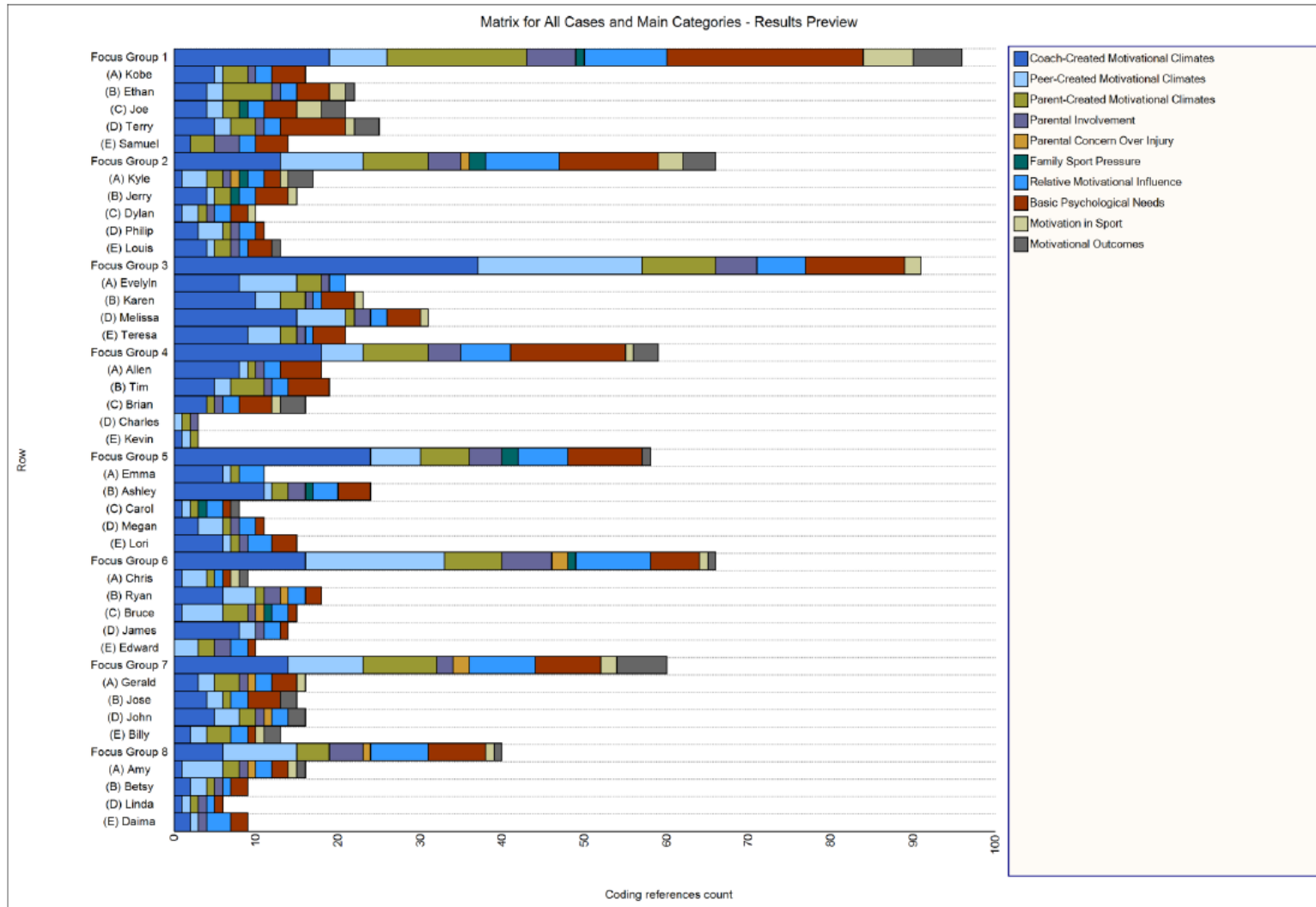
Figure 13. Number of categories coded for each focus group and corresponding participants.
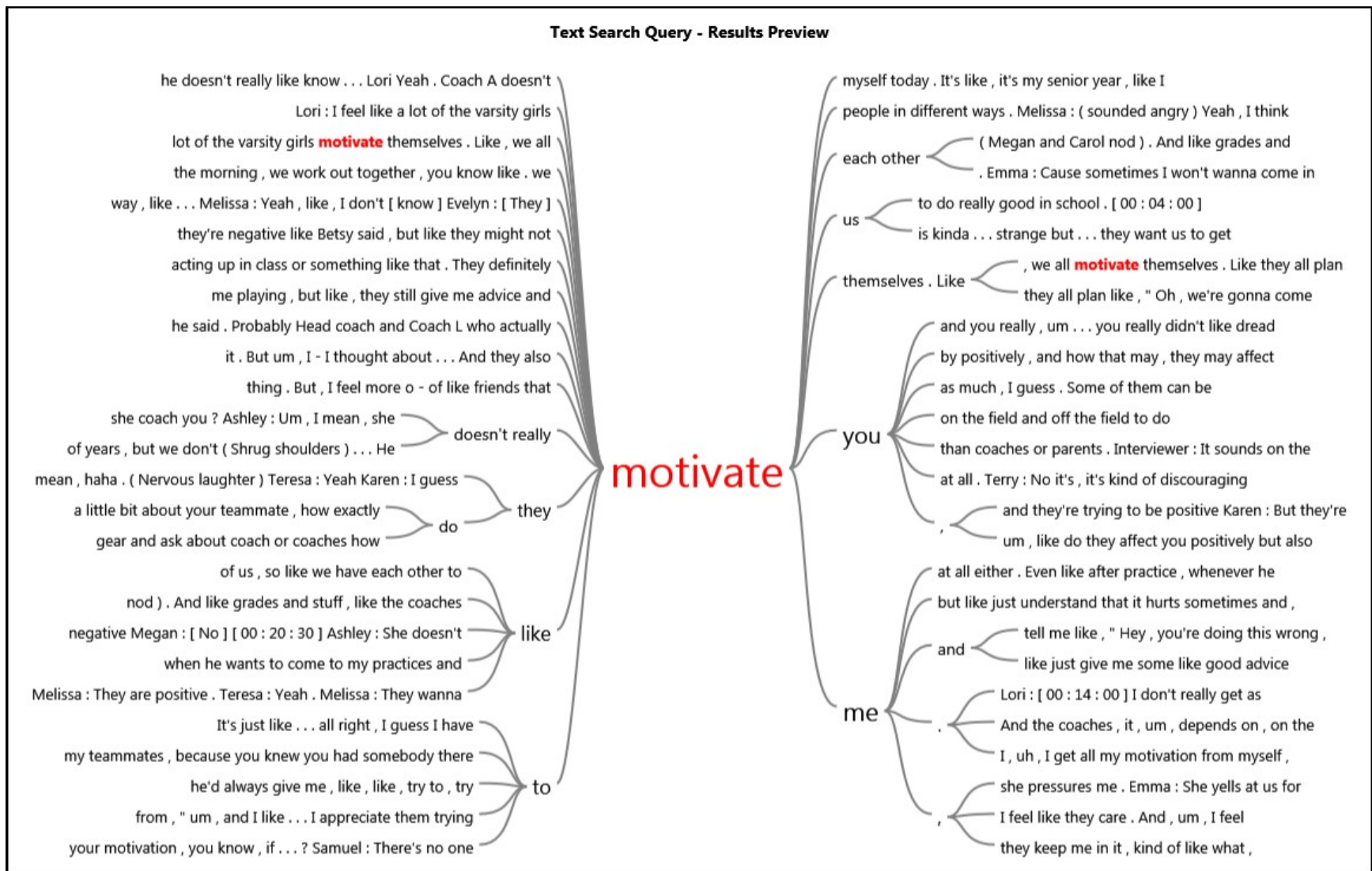
Figure 14. NVivo text search query on "amotivation/not motivate" across participants' statements.
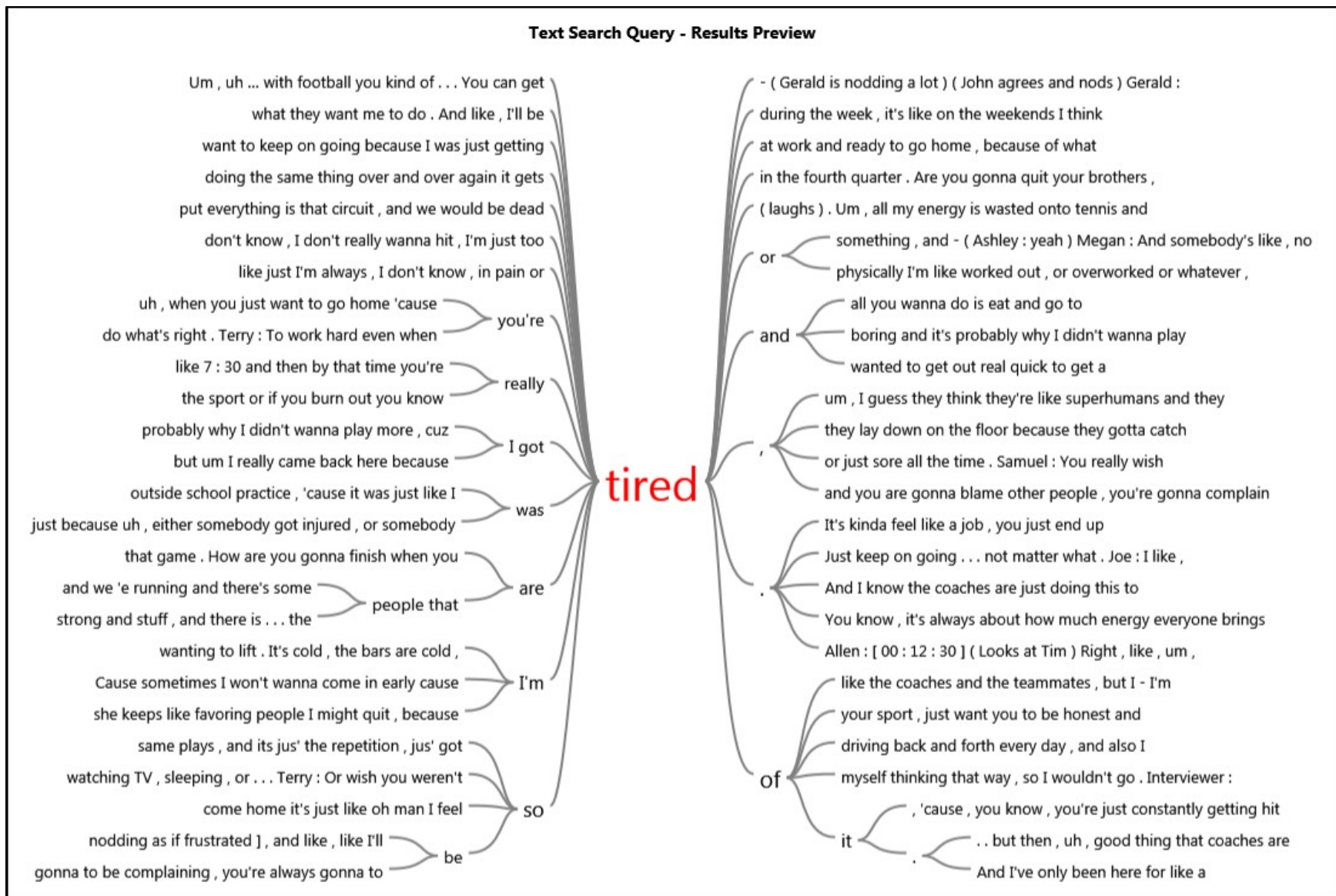
Text Search Query - Results Preview

Um , uh ... with football you kind of . . . You can get
what they want me to do . And like , I'll be
want to keep on going because I was just getting
doing the same thing over and over again it gets
put everything is that circuit , and we would be dead
don't know , I don't really wanna hit , I'm just too
like just I'm always , I don't know , in pain or
uh , when you just want to go home 'cause — you're
do what's right . Terry : To work hard even when
like 7 : 30 and then by that time you're — really
the sport or if you burn out you know
probably why I didn't wanna play more , cuz — I got
but um I really came back here because
outside school practice , 'cause it was just like I — was
just because uh , either somebody got injured , or somebody
that game . How are you gonna finish when you
and we 'e running and there's some — are
strong and stuff , and there is . . . the — people that
wanting to lift . It's cold , the bars are cold ,
Cause sometimes I won't wanna come in early cause — I'm
she keeps like favoring people I might quit , because
same plays , and its jus' the repetition , jus' got
watching TV , sleeping , or . . . Terry : Or wish you weren't
come home it's just like oh man I feel — so
nodding as if frustrated] , and like , like I'll
gonna to be complaining , you're always gonna to — be

tired

- (Gerald is nodding a lot) (John agrees and nods) Gerald :
during the week , it's like on the weekends I think
at work and ready to go home , because of what
in the fourth quarter . Are you gonna quit your brothers ,
(laughs) . Um , all my energy is wasted onto tennis and
something , and - (Ashley : yeah) Megan : And somebody's like , no
or
physically I'm like worked out , or overworked or whatever ,
all you wanna do is eat and go to
and
boring and it's probably why I didn't wanna play
wanted to get out real quick to get a
um , I guess they think they're like superhumans and they
they lay down on the floor because they gotta catch
'
or just sore all the time . Samuel : You really wish
and you are gonna blame other people , you're gonna complain
It's kinda feel like a job , you just end up
Just keep on going . . . not matter what . Joe : I like ,
.
And I know the coaches are just doing this to
You know , it's always about how much energy everyone brings
Allen : [00 : 12 : 30] (Looks at Tim) Right , like , um ,
like the coaches and the teammates , but I - I'm
your sport , just want you to be honest and
driving back and forth every day , and also I
of
myself thinking that way , so I wouldn't go . Interviewer :
, 'cause , you know , you're just constantly getting hit
it
. . but then , uh , good thing that coaches are
.
And I've only been here for like a

Figure 15. NVivo text search query on "burnout/tired" across participants' statements.

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Figure 16. NVivo text search query on "drop out/quit" across participants' statements.

Qualitative Results

The transcription of the eight focus group interviews generated 225 pages of 12-point, single-spaced text (see Appendix J for sample transcript pages). There were a total of 590 meaning units (see Appendix F): (a) 153 (25.9%) for coach-created motivational climates; (b) 93 (15.8%) for peer-created motivational climates; (c) 79 (13.4%) for parent-created motivational climates and 48 (8.2%) for other parental/family factors; (d) 70 (11.9%) for relative motivational influence; (e) 103 (17.5%) for satisfaction and frustration of psychological needs; (f) and 44 (7.4%) for motivational regulations and outcomes. It is worth noting that the frequency counts provide a general guidance but do not necessarily indicate the absolute importance of the topics and the categories. Figure 13 illustrates the number of categories coded in each of the eight focus groups and the corresponding participants ($N = 37$).

Trustworthiness and credibility of the findings were demonstrated through intercoder reliability ($\kappa > .50$; Burla et al., 2008) on the two transcripts across three coders, as well as accurate recall of interview responses during member reflections (Tracy, 2010). The member reflections also helped clarify and elaborate some of the participants' responses during the interview and changes in perceptions afterwards. For preliminary qualitative analyses, text search queries validated the characteristics of negative motivational outcomes among the focus group participants. Text search queries using synonyms of "amotivation/not motivate," "burnout," and "drop out" revealed common respective statements of participants on being pressured by coaches or having to rely on themselves for motivation (see Figure 14), feeling tired physically and psychologically (see Figure 15), and quitting their sport (see Figure 16). The occurrence of statements related to quitting (i.e., dropout intention) was the most prominent,

although some of those were about the support or pressure perceived by participants to quit or not quit.

Coach-Created Motivational Climates

The coach-created motivational climates category consisted of the largest proportion of the meaning units, 35.1% and 64.9% of which were related to the empowering motivational climate and disempowering motivational climate, respectively. Field notes and the MMCOS scores revealed that the degrees of empowering to disempowering climates in each individual coach were relatively consistent, in that coaches whom participants mentioned more empowering behaviors created more empowering climates at practice. Yet, all the coaches showed greater ratio of empowering to disempowering behaviors than participants mentioned, which might be due to the presence of researchers and social desirability. Indeed, one football coach even exhibited very different climates across two classes. Dependability and conformability were established through consistencies between field observations and focus group interviews.

Empowering Motivational Climate

Regarding the empowering climate, the largest proportion of the meaning units belonged to the lower-order category relatedness support (59.2%), followed by task-involving (24.1%) and autonomy support (16.7%).

The specific coaching strategies perceived by participants as *relatedness support*, based on the descending order of frequency, included (a) *engaging in a non-instruction conversation with athletes* (e.g., "like once a month, we all go to his house for dinner and hang out with him and his family, and we watch uh, we watch the NFL games on TV and we all just talk about

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anything" [Louis, V-FB]); (b) *adopting a positive (warm and constructive) communication style* (e.g., "I'm gonna run this event or whatever I'm like, 'I don't think I can whatever.' He's like, 'Yes you can. Yes you can.' You know, and I like feel more confident in myself because of my coach" [Daima, JV-TF]); (c) *making an active attempt to include all athletes* (e.g., "I thought he was just gonna be like a regular one that like just cares about varsity…he gave me a talk, he pulled me to the side, and like I felt noticed, I felt good" [Lori, JV-SB]); and (d) *providing unconditional regard* (e.g.,, "Like when I make a mistake, I make it into a big deal of myself. She always tells me like 'it's okay to make mistake. It's not gonna be perfect'" [Teresa, FR-BB])

The specific coaching strategies perceived by participants as *task-involving*, based on the descending order of frequency, included (a) *emphasizing task-focused competence feedback* (e.g., "Coach B, he came and then he gave me, um, advice, such, such as, 'oh, just control your top spin a bit more,' and then those, those advices would often ... um, it would work for me, and then he's also more of a coach that gives motivation." [Allen, V-T]); (b) *recognizing effort and improvement* (e.g., "if we mess up, our coaches like, they'll tell us something like 'it's okay, you're gonna get it next time, you're gonna work harder' [Melissa, JV-BB]); (c) *using cooperative learning* (e.g., "sometimes at practice at the end, we play against the coaches, like, just have fun. Like play, um, like uh, miniature football game against the coaches" [Louis, V-FB]); and (d) *explaining player role importance* (e.g.,, "Once we are in the locker room or he sees me, he just always give me, like, he wants me to like, um, be, like, great, like bigger, stronger, faster. So he always gives me, uh, advice, and like he wants to see me on the next level, which is varsity" [Ryan, FR-FB]).

The specific coaching strategies perceived by participants as *autonomy support*, based on the descending order of frequency, included (a) *acknowledging feelings and perspective* (e.g.,

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"Yeah, he's like, he's always on time to be at practice or something. He's, you know, always making you work hard, um, you know, within your limit, so you don't like pass out or something like that" [James, FR-FB]); (b) *emphasizing intrinsic task interest* (e.g., "he'll just be like, 'play however you want, and enjoy it'" [Brian, V-T]); (c) *providing rationale for tasks, requests, and constraints* (e.g., "he always tells me how like, he knows, he knew I could do…believe later I can like make it up to varsity" [Evelyn, FR-CC]); (d) *encouraging initiative taking* (e.g., "I've, you know, been pretty upset with myself in the games, and you know he'll just go out there and be like, 'Just play how you want to play'" [Brian, V-T]); and (e) *providing meaningful choices* (e.g., "Coach W, where he would, um, kind of give alternatives, you know" [Allen, V-T]). While relatively few participants talked about abovementioned strategies, no participants mentioned any meaning units related to the strategy of *providing opportunities for input*.

· Disempowering motivational climate – Concerning the disempowering climate, the meaning units were manifested in the lower-order categories *controlling* (69.0%) and *ego-involving* (31.0%).

The specific coaching strategies perceived by participants as *controlling*, based on the descending order of frequency, included (a) *devaluing athletes' perspective* (e.g., "Everything that we do, she likes shoots us down…because it's like I try here and she doesn't notice, like she doesn't care and she's just like, 'Okay, go away'" [Carol, JV-SB]); (b) *intimidating (to frighten by threats) athletes* (e.g., "they say stuff like, 'Oh, if you don't come in the mornings you're not going to be on varsity,' or, 'If you're not trying hard enough you're not going to be on varsity'" [Jose, JV-FB]); (c) *exerting overt (physical, personal) control* (e.g., "they never let us warm-up. I completely uh...I strained my pac muscles. And it's still not the same to this day... like it's still messed up. And uh, I have, I have damaged C4 and C5 in my vertebrae. And uh, they made me

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keep squatting... doctor was not happy about but." [Joe, V-FB]); (d) *using controlling language* (e.g.,, "she yells at us for like ... we all come in in the morning to like go to the weight room more, and she'll go in there and start yelling at us because we didn't do something that she didn't like,'" [Emma, V-SB]); and (e) *providing negative conditional regard* (e.g., "the second time you mess up, they're really mad. They're yelling 'Why are you doing that? You know better.'" [Karen, JV-SB]). Although these controlling strategies were reported being used by many coaches, no participants mentioned any meaning units related to the strategy of *using rewards for control*.

The specific coaching strategies perceived by participants as *ego-involving*, based on the descending order of frequency, included (a) *recognizes superior and inferior ability* (e.g., "I missed one game, and I sat on the bench the next game…one girl, who's gonna miss three games …and they told her that she doesn't have to make it up cause she's our most valuable player" [Melissa, JV-BB]); (b) *encouraging inter- or intra-team rivalry* (e.g., "last week, I had two coaches, offensive coaches arguing on the sideline and yelling at each other. And the head coach had to step in and calm them down. That's happened twice now" [Kobe, JV-FB]); and (c) *using punishment for mistakes* (e.g., "as soon as you mess up... like they'll take you out, and like having you sit..." [Teresa, FR-BB]).

· Mixed perceptions of coach-created climates – Participants described how they perceived different motivational climates from different coaches; some were more empowering while some were more disempowering. This phenomenon seemed to happen more in team sports that had a larger size, such as football:

> Ryan (FR-FB): I think the best coach who treated me well was, um, probably head coach. Uh, I did... He usually wasn't at our practices, and we don't really see him a lot. But, like, every now and then, he- he'd always give me, like, like, try to, try to motivate me and like just give me some like good advice like towards football and like my grades and life and

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stuff like that. But, yeah, he, he's probably, like, he's the best one who treated me well. But I feel like Coach F ... He's a good coach, but I- I just ... I feel like he doesn't, like, like me as much as he likes other people. I don't know if I, like, did something, or ... I don- I don't know. I just feel like he doesn't treat me the same as he treats other kids and football players. But that's just based off of my experience.

Participants also explained how some coaches had a bigger impact on their motivation

than other coaches:

Interviewer: So sounds like you are usually closer to the position coach, and that relationship matters the most, probably more so than head coach would you say?

Ethan (V-FB): Yeah, your position coach is the coach you care about the most.

Samuel: Because he's gonna be the one who's helping you. He's gonna be the one that, uh, argues back when you do something right and you get yelled at by another coach. We have coaches who are almost getting fights.

Terry (V-FB): Over us-

Kobe (JV-FB): Yeah-

Ethan (V-FB): Like they can afford us to other coaches because we've been treated bad.

Terry: Two guys getting in a fight, the two coaches would go after each other too.

Ethan (V-FB): And it, and it really shows like they do care about us more than we know.

The focus group conversations also revealed differential perceptions of participants

toward the same coaches and/or the same coaching behaviors:

Joe (V-FB): I know I'm a lot different than pretty much everybody at this table, like uh... I don't know. I guess I have a lot of, I mean negative, negative points of view on things. And uh... I mean I love playing with these guys. These guys are great! These guys are the only thing that keep me sane. Um... another thing about it is uh... I'm pretty much lost, lost love for the game because of these coaches.

Moreover, some participants were able to understand coach perspectives and interpret a

seemingly disempowering climate as more neutral or even empowering:

John (JV-FB): Why I think they do it is because like maybe they have that mentality to like ... Maybe that's what they've all been through or something like that, so I think if that's all they know during their years of football, that's all they are going to know and that's all they are going to know how to punish somebody else.

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While the differences in perceived coach-created climates stemmed from coaches of the same high school team in the examples above, these differential impacts might come from coaches outside of high school, especially for individual sports such as tennis:

> Brian: Uh, most positive influence? Uh, I would say Coach J (an outside coach). I feel like he's a really ... he's who got me through, uh, challengers, and I was able to champ up, because I feel like that coach, uh, I feel like since he was so close in age too, that I was able to relate to him more in tennis and stuff, so I was able to catch more of what he was coaching me on.

> Tim: I think the person who has the most positive influence is my private lesson coach. He, he already went through what I was experiencing before because he's ... he has a lot of experiences that I felt before, so I feel like it's ... he's very relatable.

Peer-Created Motivational Climates

The peer-created motivational climates category consisted of the second largest proportion of the meaning units, 44.1% and 55.9% of which were related to a positive and a negative climate, respectively.

·   Peer-created positive climate – With regard to the positive climate, the meaning units were manifested in the lower-order categories *task-involving* (51.2%) and *relatedness support* (48.8%). None of the meaning units were manifested in the *autonomy support*.

The specific peer-created climate perceived by participants as *task-involving*, based on the descending order of frequency, included (a) *improvement* (e.g., "I feel like that helps our motivation a lot, and when we make mistakes, there's no judgment. There's ... instead, they give out, you know, like tips or things that'll help you" [Kevin, O-CC]); (b) *effort* (e.g., "it really helps when you have your teammates there and they're trying, both of you are suffering, you're running you're like, 'Oh my God I don't think I can make it,'…they're like "You know, you gotta keep going, push…'" [Amy, V-TF]); (c) *cooperation* (e.g., "I feel like everyone always brought the right attitude to what we do, I think no one would have negative thought in what we were doing"

[Ethan, V-FB]); and (d) *equal treatment* (e.g., "they could like ignore you outside of softball, but when it's like softball, it's like business and they don't like put any drama in it" [Ashley, JV-SB]).

Relatedness support was perceived by participants quite evenly across gender and sports such as in (a) football (e.g., "Even our practice there's just something, like in between plays you're messing around with your friends. You're just hanging around people you really enjoy being around" [Terry, V-FB]); (b) track and field (e.g., "making bond more together, support other slower runners I guess, and they do that on the races too… like we care for each other as a team" [Philip, JV-TF]); (c) cross country (e.g., "in cross country, like everyone is really positive. And then like it's always cheering each other on" [Evelyn, FR-CC]); and (d) softball:

> Emma (V-SB): Cause sometimes I won't wanna come in early, cause I'm tired or something, and-
>
> Megan (V-SB): And somebody's like, no I'm coming to get you, you better-
>
> Emma (V-SB): I'm at your house right now (laugh). I'm like, "oh, okay, I guess."

· Peer-created negative climate – In terms of the negative climate, the meaning units were manifested in the lower-order categories *ego-involving* (94.2%) and *controlling* (5.8%).

The specific peer-created climate perceived by participants as *ego-involving*, based on the descending order of frequency, included (a) *intra-team conflict* (e.g., "the trust is not there, and if someone messes up, instead of like cheering him up, picking him up, we kinda of like bash on him or talk bad and go 'dude you shouldn't have done that'" [Kyle, JV-BB]); (b) *intra-team competition or ability comparison* (e.g., "he would always be like, 'Hey, coach, can I play Tim, or can I play Allen first?' Assuming that he would beat us quickly.'" [Allen, V-T]); and (c) *normative ability* (e.g., "they didn't really show that much respect, like they would have, like their own certain people that they would show respect to, instead of just everyone in the team being a team" [Gerald, JV-FB]).

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Controlling peer behaviors were perceived by only three participants, including (a) the use of controlling language (e.g., "if someone has a bad day, the whole helping thing is a little bit less positive than normal. Sometimes they say 'Hey, try to put your gloves down.' Sometimes they're like 'You need to put your gloves down!'" [Karen, JV-SB]); (b) negative conditional regard (e.g., "we have a meet that day... like the previous day, and you didn't try like they'll be mad at you and... while we're running, they will really like, like, pretend you're not there sometimes" [Evelyn, FR-CC]); and (c) exertion of overt control (e.g., "every single time he started to get a little bit too loud someone would always walk up to him and tell him to shut up, very specifically ... and it's usually not as nice as 'shut up'" [Billy, JV-FB]).

· Mixed perceptions of peer-created climates – In addition to the aforementioned differences in coach-created climates, participants mentioned that their teammates acted differently in front of different coaches and thus created various climates at different times:

Melissa (JV-BB): You can definitely tell, like in practices, nobody goes as hard when it's just like our coach, which is... our coach is just like the JV Coach... But let's say if it's-

Teresa (FR-BB): If the varsity coach is there-

Melissa (JV-BB): If Coach S walks in, she's like the athletic head director, head coach of basketball. In general, as she walks in, then the intensity is like-

Teresa (FR-BB): Uh-huh-

Melissa (JV-BB): Everybody is trying-

(Everyone nods)

Teresa (FR-BB): Yeah.

Interviewer: How about in softball?

Karen (JV-SB): Um... softball... our head coaches (a male and a female) are always out there with us cause we all just practice together, cause he's not (inaudible), she's always out there with us. But in off-season, I feel like it was the same. Sometimes Coach S'd just be out there with us… Everyone is going harder than they normally would if it were just Coach B (assistant coach) there.

Participants who were juniors or seniors perceived changes in peer-created climates over time. Specifically, they described the older peers on varsity teams who contributed to a more negative climate, and that the climate improved after those peers left:

Ethan (V-FB): Like our grade we've always been close, always will be. But sophomore year we had the junior class and the senior class and they, they were kind of distant with us. We only had four sophomores on varsity at that time… Then junior year came around and it was decent, we had a decent relationship with the senior class but it still was not the best because you know different personalities, there was a bunch of negative and people who were just playing the sport cause their friend was playing it.

Terry (V-FB): Didn't actually like football.

Samuel: Didn't have a motive, didn't have a competitive drive. Towards the middle of the season the seniors were saying "I can't wait for the season to be over with" they were done half way through the year, mentally.

Ethan (V-FB): But this year, man, it's been great.

Terry (V-FB): And another big thing last year, if something went wrong, if offense didn't score defense would blame us and you know get on us about it, and we'd do the same back to them, and it got to the point where we just almost hated each other.

Samuel (V-FB): We were divided as a team.

Terry (V-FB): Almost two different teams on the same side, and that's a huge part. You can't be doing that.

The changes in the perceived peer-create climate did not only influence the varsity team but also across team type:

Ashley (JV-SB): It was annoying, because like all of varsity girls, they're always like, especially the upperclassmen, they were like had a really bad attitude about it (using the same locker room as the JV team).

Emma (V-SB): Our seniors last year were like-

Megan (V-SB): Awful. They weren't good examples by any means.

Parent-Created Motivational Climates

The parent-created motivational climates category consisted of 60.8% and 39.2% of the meaning units that were related to a positive and a negative climate, respectively.

· Parent-created positive climate – With respect to the positive climate, the largest proportion of the meaning units belonged to the lower-order category *relatedness support* (60.4%), followed by *autonomy support* (22.9%) and *task-involving* (16.7%).

Relatedness support was perceived by participants quite evenly across gender and sports such as in (a) football (e.g., "I always think it's true support, the love and all the... the support they give me it, it helps me more than anything." [Ethan, V-FB]); (b) track and field (e.g., "my mom's really supportive, supporting like our team overall, cause she, she goes to all the meets every Saturday, even cross country, she would go to all the meets and track, I don't know, I guess that's really caring" [Philip, JV-TF]); (c) cross country (e.g., "I always try to be this one person. Like she's been doing cross country... and like I did it, and like, just like... she was, my mom, my dad was really proud of me." [Evelyn, FR-CC]); (d) and basketball (e.g., "And I always like, I think I feel worse about like how I did in the match. Like they sometimes, like "you didn't do that bad" too. They're more supportive" [Teresa, FR-BB].

Although *autonomy support* was perceived by participants quite evenly across sports, boys mentioned parental behaviors related to this code more than girls (only two) did. The majority of the autonomy-supportive behaviors were related to whether participants were allowed to participate in or drop out of their sport (e.g., "I know for me like my parents would have been happy with me whether I wouldn't have played or I woulda played" [Dylan, V-F]), whereas only one participant mentioned parental behaviors related to other aspects of the sport participation:

> Amy (V-TF): I'm always, I don't know, in pain or tired or physically I'm like worked out, or overworked or whatever, um… then they're like "go ahead and take a break." So, um, my dad he's more of the type to say, "Oh you don't feel good you don't need to go to practice today. Like you can tell the coach cause I don't want you out there running and next thing you know you fall down and you die."

A few participants attributed the autonomy-supportive parental behaviors in sport to a global level beyond a contextual level, which indicated autonomy-supportive parents in general:

Charles (JV-CC): My parents, like, they support basically, like, most things that I do. I mean, if it's something dumb, obviously not, but like most like if I decide to join a club or join a team or do something, some sort of activity of any sort, then they'll most likely be okay with it… They'll be supportive if I decide to do something, but they'll also be supportive if they can just see I'm not feeling it anymore.

The parent-created *task-involving* (i.e., *learning-oriented*) climate was manifested in the form of (a) self-referenced criteria (i.e., improvement) for success (e.g., "my step dad, he's actually a really great guy. When he heard that I wanted to play football and join the marines, he, uh, gave me weights, equipment, gear. And he just motivates me to be better than myself" [Edward, FR-FB]); (b) effort (e.g., "we'll (the players) be like ready for practice and then we won't do anything. So I'll be all mad about that. And then they'll (parents) be like, "It's okay. Just work hard during the season and you'll be fine.'" [Ashley, JV-SB]); and (c) making mistakes as a part of learning (e.g., "my parents have the same effect, like, they just make it "Hey! You've been doing nice!" like "You got it! It's okay! You've been doing good! Everyone messes up!" [Karen, JV-SB]).

· Parent-created negative climate – In terms of the negative climate, the meaning units were manifested in the lower-order categories *controlling* (80.6%) and *ego-involving* (19.4%). These perceived negative climates were more prevalent in football than in other sports.

Controlling parental behaviors were perceived by approximately half of the participants. These behaviors were manifested in similar ways as controlling coaching behaviors, including (a) *devaluing athletes' perspective* (e.g., "there's no talking about quitting football, there's no anything else, 'You're playing'" [Terry, V-FB]); (b) *intimidating (to frighten by threats) athletes* (e.g., "my dad has openly threatened to take away basically all of my belongings. Um, but then

he backed down when he realized I wasn't backing down" [Billy, JV-FB]); (c) *exerting overt (physical, personal) control* (e.g., "after game about 10 at night and um my dad, you know, just stopped the truck and said, you know, 'You can get out.' Cause we were arguing about the game and said 'You can get out and walk'" [Kobe, JV-FB]); (d) *using controlling language* (e.g., "my parents are like, "Hey, you probably shouldn't lose so we can go visit your sister." I'm like, 'Okay, that's a little pressuring'" [Tim, V-T]); and (e) *providing negative conditional regard* (e.g., "I'll see him after game, and he, sometimes he won't say anything, he'd just look at me and shake his head. We'll get on the bus and he'll just start blowing up my phone" [Joe, V-FB]). Although these controlling strategies were reported being used by many parents, no participants mentioned any meaning units related to the strategy of using rewards for control.

Regarding the parent-created *ego-involving* climate, all six meaning units belonged to the lower-order category *worry-conducive*, emphasizing winning and normative comparison, whereas no meaning units were related to *success without effort*. The other-referenced criteria for success was manifested both in reference to the participants' peers (e.g., "she just tells me, uh, "to be better than the other guy, to always keep trying," and "if you see a competition, to always beat the competition'" [Edward, FR-FB]) as well as their family members (e.g., "my little brother, he's like 10, he's like really, really good [at baseball]. And like, I kind of feel like he's like better than me at everything, and my stepdad's like, 'your brother's better than you and he's 10'" [Ashley, JV-SB]).

· Mixed perceptions of parent-created climates – Of the 79 meaning units, 35.5%, 21.5%, 43.0% were related to the climates created by fathers only, by mothers only, and by both parents, respectively. Therefore, fathers were mentioned by the participants more frequently than mothers in relation to parent-created climates. Whereas fathers and mothers played relatively

equal roles in contributing to a positive climate (25% fathers, 22.9% mothers, 52.1% both), fathers played a stronger role than mothers in contributing to a negative climate (51.6% fathers, 19.4% mothers, 29.0% both), especially controlling behaviors. Participants described how they perceived different motivational climates from their parents who sometimes maintained a balance between positive and negative climates.

> Ethan (V-FB): My mom will, only pick out the good stuff. She's the only one that'll do "Aw, you looked so good out there when you did that one thing," and you know that's, that's where the happy medium comes in. You got your dad who's going to criticize you and your mom who's going to lift you up, and I, I think it's the perfect combo.

> Kobe (JV-FB): And um you know, my mom usually is supportive you know, whenever I was younger um, she was you know, very supportive and at this point she's kind of the medium, like Ethan said between my dad and I.

The balance of positive and negative climates also appeared within parents beyond between parents, indicating that parents might show more supportive behaviors or controlling behaviors at different times.

> Tim (V-T): In the JV challenge matches, they expected a lot, like, they expected me to get back on varsity, but it took me like four tries to get back on, and I feel like they just sometimes put too much pressure on me, but other than that, they've been very supportive of tennis for me, and they recognize that it's time for me to unleash my stress, so, um, you know, they're very supportive, and it kind of hinders motivation…

The balanced parent-created climate sometimes stemmed from the participants who understood parent perspectives and interpreted controlling behaviors as more neutral or even supportive. Moreover, the interpretation of these positive and negative parent-created climates could change over time:

> Ethan (V-FB): I got to the point to where I didn't see it helping me and so I told him to stop it. I told him, "Quit trying to give me advice, I know what I'm doing, I got coaches for that. Stop, you know implementing your opinions on what I'm doing, if it needs to be done I'll get it done." And uh, I kind of regret doing that, because you know, having those talks just show that they care about you, and like, I always had some of the deepest talks when it started off like that. You know, I connected with my dad through that, cause he never got to play football just like Samuel's dad. And so uh, me and him talking about

that one on one was always a nice little get away because we never really got to talk one to one… And so, I kind of asked him to start doing that again, and uh, I always felt like it's, it's now helping in a way, cause I'm seeing it in the right perspective. I'm not letting it nag on me and make me feel bad about what I'm doing because, I screw up on this one play he's getting mad at me for it. I'm always seeing it now as… constructive criticism.

Other Family Influence

Participants stated other family factors beyond the deductive codes of parent-created motivational climates that influenced their motivation; therefore, these factors were coded inductively based on the common themes of the content. This inductive coding process resulted in a factor of *family sport pressure* and two additional factors of parental influence: *parental involvement* and *parental concern over injury*.

· Family sport pressure – Eight participants perceived pressure from their family members, either fathers or brothers, who played the same sport. Although the perceived family sport pressure mostly came from fathers who were successful at the sport (e.g., "my dad was at his school as a sophomore, he set the all-time rushing record on varsity. So uh, yeah, my dad, my dad has high expectations from me whatever I'm doing" [Joe, V-FB]), it also came from those who did not play at a high level but wanted the participants to do so (e.g., "I mean, he played it in high school and tried at college and he didn't make the cut. He kind of wanted me to try it and try it out" [Bruce, FR-FB]).

It is worth noting that the family sport pressure might not always indicate negative motivational climates created by parents, but the participants' perceived needs of performing well in their sport instead:

Kyle (JV-BB): I mean, I don't get any pressure coming from my, uh, parents about playing sports, the pressure I get for like trying stay in shape and what not come from my oldest brother who was like a, uh, he played three sports: baseball, basketball, and football all throughout high school. And uh, so most pressure just comes from him and trying like live up to how good he was. Cause I think he was varsity on all three sports by

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his sophomore year. So it's just like that pressure of trying to like live up to how good he was, but he's like never like bashed me, he's always given me advice and what not, he's supportive. It's just like the pressure of like how good he was, I'm trying to live up to that.

    ·   Parental involvement – Based on Hellstedt's (1987) parental involvement continuum,

The *parental involvement* category was divided into three codes, representing the levels of involvement: *underinvolvement, moderate involvement,* and *overinvolvement*. The frequency of these codes were relatively even, although moderate involvement was mentioned slightly more often.

Participants described the *underinvolvement* of their parents as "they don't care," which was mostly related to an emphasis on academic performance over sport participation:

> Allen (V-T): They may be like, um, school over tennis. "You're not going to play tennis in the future. So, you might as well just not play," and uh… "when you go to that tournament, um, we really don't mind if you lose, cause you're just going to be wearing yourself out if you win." So, my parents are like, uh, "don't even ... just don't even do the tennis group lessons, don't do any of that"…

Participants described the *moderate involvement* of their parents as being "supportive" while not demanding of the participants regarding their performance. While the parents might attend the participants' competitions, they tended to not interact with participants during the competitions but afterwards:

> Karen (JV-SB): And then, like after the game, like on the car ride home, whenever like, that's when they're like start talking like "You did good! You could've done better here. This person is doing really good" Like, I feel like they don't talk about it, they're not like loud, or... they don't talk at the game, more so than they do on the car ride home.

Participants described the *overinvolvement* of their parents as a source of pressure due to their active interactions with the participants during and after their practices and/or competitions:

> Terry (V-FB): I mean, yeah they support me, and they're always there for me. But it's, it's pressure all the time. The first time, first thing I do as soon as I get out of the locker room, I go and see my dad. He drives up to my truck and we talk about the game, and it's not just there, we talk about it all the way home, we talk about it after, we talk about it

night and day and it's like every morning every night. "You did this, what can you do better? How can you do better? What else do you need to be doing?" And it's just crazy cause it's like, that's all we ever talk about now, and it's football.

Similar to the frequency of negative parent-created climates, overinvolvement was mentioned more often regarding father's over mother's involvement.

· Parental concern over injury – Of the seven participants who expressed parental concern over injury from their sport participation, six were football players (e.g., "Even since Pee Wee she hated it, because she doesn't want me getting hurt, she's always tried to talk me out of it" [Gerald, JV-FB]) and one was female track athlete. All seven participants mentioned only one of the parents who had concern over injury from their participation. This parental concern was not necessarily related to controlling parental behaviors but parents' worries and fears that led to less encouragement of participants' sport participation.

Relative Motivational Influence

All of the participants, except two who had to leave early during the focus group interview, responded to the question about which of the three social agents had the most positive and which agent had the most negative influence on their motivation.

· Most positive influence – Among the 35 responses regarding the most positive influence on motivation, teammates were mentioned the most often (11), followed by parents (10), coaches (7), both coaches and teammates (2), both coaches and parents (2), and both teammates and parents (1).

Several football players described that their parents (mostly fathers) had the most positive motivational influence because of the parents' active involvement, although they also mentioned many of the parents' controlling behaviors throughout the interview. One player in particular

stated his negative attitude toward most of his father's behaviors, although he perceived it as a "positive" influence on his motivation:

> Kobe (JV-FB): You know my goal is not to, you know, make my dad happy. My goals is more, I just want to shut him up basically. My goals is more, you know, I just want to shut him up basically. Every game I'm thinking, you know, I just want to shut him up, you know. I don't want to give him reasons to be able to critique me for two hours. Um, and come in my room, and just take a piece of paper, and just com-, write a whole list, um of things, 50 somewhat things and just um, can't go over one of them for about two hours each it seems like. And just continuously, um, bag on me about certain things. For me it's more of a.... I wanna be able, you know-

> Samuel (V-FB): (whispers) Prove him wrong.

> Kobe (V-FB): Yeah, prove him wrong and shut him up.

> Interviewer: Do you think you're motivated positively or negatively?

> Kobe (JV-FB): I feel like it's both in some aspects, but you know… um you know in my opinion… that's kind of a positive cause that's my end goal, to basically shut him up.

Two participants (Terry and Kyle) mentioned competition in place of any social agent as their most positive influence:

> Terry (V-FB): I think my biggest motivation for it is competition, I've always been around competition, always loved it, and I'm really not having fun unless it's a competition no matter what it is. There always has to be a winner and a loser, some way you can tell you've done better than last time. Otherwise, I don't feel like I've done anything better. Like, even in power lifting I'm not competing with anybody else, I'm competing against myself, and that "Can I get this weight, can I do better than last time?", that's always been the biggest thing for me is that I just love competition, and that's probably why I keep playing.

· Most negative influence – Among the 35 responses concerning the most negative influence on motivation, teammates were mentioned the most often (13), followed by coaches (10), both coaches and teammates (2), and parents (1). Two football players mentioned the nature of the sport (e.g., "just really just the over bearing part of football is the negative" [Samuel, V-FB]) while one tennis player pointed out himself (e.g., "most negative, I feel like it's sometimes just myself, and how I perceive ... or how I feel like other people perceive me, cause I

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just feel like whenever, um, I'm not playing my best, I'm very hard on myself" [Tim, V-T])

instead of any social agent as their most negative influence. On the other hand, six participants

who were individual sport athletes explained that there were not any negative influence from

social agents, although some were less "positive," "supportive," or "motivating" than the others:

> Betsy: I don't think any of them are really, truly negative, but some aren't as positive as
> the others. Like maybe your parent doesn't really want you to play that sport.
>
> Linda: Yes.
>
> Betsy: Or something like that. Well they're usually pretty, they're still, um, like
> motivating, but maybe not as much as like the coaches or your other teammates.
> (Everyone nods)
>
> · Consistency of relative motivational influence – The responses related to the relative

motivational influence of social agent were relatively consistent with those related to the

motivational climates in the overall findings, as well as within individuals and within groups, but

not across groups. Therefore, the question about relative influence served as a tool for

triangulation to a certain extent. Among the overall responses, the ratio of the frequency counts

for most positive influence to most negative influence was the highest for parents and the lowest

for coaches, while teammates were the social agent who had the highest frequency counts for

both most positive and most negative influence with slightly more negative counts. These results

were consistent with the ratio of frequency counts for a positive to a negative climate, which was

the highest for parents and the lowest for coaches. Similarly, teammates had slight more

frequency counts for a negative climate than a positive climate.

Within individuals, participants tended to report a social agent as the most positive

influence when they mentioned the highest ratio of positive codes in the category of *motivational*

climates created by that social agent; participants tended to report a social agent as the most

negative influence when they mentioned the highest ratio of negative codes in the category of

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motivational climates created by that social agent. Similar to the findings of *coach-created*

motivational climates, several team sport athletes indicated that some coaches had the most

positive influence, while the other coaches had the most negative influence on their motivation.

There were responses for head coach having the most positive influence and assistant coaches

having the most negative influence, and vice versa. Furthermore, in congruence with the findings

of *peer-created motivational climates*, the relative influence of teammates was more fluid and

conditional based on the team composition and the behaviors of certain teammates:

> Jose (JV-FB): The worst would be the teammates because, you know, they're just in their
> own world and I mean, yeah, they can be, uh, positive but they're also negative, either
> they're playing around or not, they-they kind of mess with you and stuff.

The majority of the focus group members, who were mostly athletes playing the same

sport and having the same coaches, agreed with each other within groups on the relative

influence of the social agents, particularly the most negative influence of coaches or teammates.

Yet, participants who played the same sport and had the same coaches had slightly different

codes across two different focus groups.

Satisfaction and Frustration of Psychological Needs

The basic psychological needs category consisted of the second largest proportion of the

meaning units, 44.1% and 55.9% of which were related to psychological need satisfaction and

psychological need frustration, respectively. Table 22 displays the coexistence of the codes for

each need satisfaction and frustration together with positive and negative motivational climates

created by each social agent when participants' responses contained both psychological needs

and motivational climates. In general, cooccurrence of need frustration and negative motivational

climates was more common than that of need satisfaction and positive motivational climates.

· Psychological need satisfaction – With regard to satisfaction of psychological needs, the meaning units were mostly manifested in the code *relatedness satisfaction* (28.6%) and *competence satisfaction* (71.4%). Yet, none of the meaning units were associated with *autonomy satisfaction*.

The occurrence of *relatedness satisfaction* was mostly related to peers, followed by parents and coaches (see Table 22). Participants described how their perceived *relatedness satisfaction* with peers when they experienced challenges with teammates together and provided emotional support to one another (e.g., "we understand that like we're going to get yelled at and stuff, like that's part of playing it, but um, we always make sure we'll pick each other back up and not let us get too down" [Louis, V-FB]). On the other hand, participants generally perceived *relatedness satisfaction* with coaches and parents when they felt that these two social agents motivated them to work hard and improve skills ("I feel like since he was so close in age too, that I was able to relate to him more in tennis and stuff, so I was able to catch more of what he was coaching me on" [Tim, V-T]; "he'd (dad) bring it up and pick at me… he doesn't have an argument against me. It feels like kind of it's a support and kind of a motivation… to uh get better and not make the same mistakes [Samuel, V-FB]). There were one interesting cooccurrence of coaches' controlling behavior and *relatedness satisfaction*, which represented the uniqueness of high school coaches who were also teachers of student-athletes and cared about their academics:

> James (FR-FB): He's like a f-, he's still like a high school football player but coaching instead. So, you know, he- he talks all the fun little trash and all that stuff, but then he's also, you know, like if your grades starting to fall down, or, you know ... He'll make ... He'll literally force you to go into tutoring. He will, like, pick you up and take you to tutoring. Or, um, you know, he'll, he'll, you know, work you extra hard if you were acting up in class or something like that. They definitely motivate you on the field and off the field to do better. (Ryan and Bruce smile in agreement)

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The occurrence of *competence satisfaction* was mostly related to coaches. For the four girls who expressed competence satisfaction, their responses were associated with social agents who provided them with competence feedback (e.g., "He (a coach) acknowledges you. Like yesterday after practice, he was like, 'Good job, Ashley.' I was like, 'Aw, thanks.' No one ever does that" [Ashley, JV-SB]). For boys, beyond the support from social agents, some football players stated the competitive nature of the sport as the source of their competence satisfaction (e.g., "there's nothing better than that feeling of when you do just completely beat your opponent" [Terry, V-FB]).

· Psychological need frustration – With respect to frustration of psychological needs, the largest proportion of the meaning units belonged to the code *autonomy frustration* and *competence frustration* (35.5% each), followed by *relatedness frustration* (29.0%).

The occurrence of *autonomy frustration* was mostly related to coaches and then parents (see Table 22). Participants explained a variety of unreasonable requests that made them feel controlled to perform certain behaviors. These requests happened in training (e.g., "I don't think that we should stand shoulder to shoulder and not be able to talk on the sideline at practice... and we have to keep our helmet on the whole time" [Jerry, V-FB]), in competition (e.g., "sometimes like a last minute arrangement, like, 'Okay what are you doing? You're not doing anything. Okay, well come run this relay, or get in this event.' And you're like, 'What? I haven't been practicing for that' [Amy, V-TF]), and outside of the sport setting ("there's been times when I'll just go in my room and I'll lock the door cause I'm done talking with them (parents) about football" [Terry, V-FB]). The feeling of *autonomy frustration* happened more frequently for boys, football players in particular, than girls.

The occurrence of *competence frustration* was mostly related to coaches. Participant described how they felt inadequate or incompetent in certain training or competition environments, about half of which were associated with negative comments of social agents (e.g., "I had to lower myself back to like JV and helping them out again. And then ... so it's just like, instead of her helping me come up, I feel like she's (a coach) always bringing me down" [Lori, JV-SB]), whereas the other half were related to perceived incompetence from participants' own perspective:

> Chris (FR-FB): I just think that, like, if you mess up around someone that's a higher position or they have a higher max or, um, I don't know, they're just better than you, better than you in some way, then, like, you just, you feel this small sense of judgment. Like, "Oh my gosh! Someone higher than me thinks I suck," or whatever. And you wanna feel that, but, um, I don't know.

In contrast to some boys who perceived *competence satisfaction* from competitions, some girls expressed *competence frustration* due to their avoidance of competitions:

> Linda (FR-TF): Yeah I agree, like sometimes they're like competition, like I like running a lot more by myself but then sometimes the competition makes you not wanna do it as much I guess.

> Betsy: It's just really intimidating being the, uh, in competition with girls who've done really well. So it's kind of scary to have to go against them because you feel like you're really going to lose. Yikes. (Amy and Daima agree)

The occurrence of *relatedness frustration* was mostly related to peers, although there were also a number of codes related to coaches and parents. Multiple causes existed that led to frustration of participants' relatedness, while one of the common incidence included feeling disapproved or disrespected by other. This cause was also somewhat related to *competence frustration* that stemmed from sport ability and performance:

> Bruce (FR-FB): When we had kickoff. I tried to catch the ball, and ran… hit it. And then a bunch of guys thought I caught it, and I got dog piled and all over my leg, and then rolled a guy. And when I got back after B walked me down to a trainer, everyone was asking me, "Bruce, you nearly had ... ne- nearly gave us, gave the guy behind you a

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chance to get the ball." And I told them, "Look, I only tried to help. And this is the thanks I get?" Is that really the thanks I got? That's k- how I kind of see it at times. Do I deserve just for trying?

The second cause of *relatedness frustration* was connected to *autonomy frustration* in a

sense that participants felt disconnected or not understood by coaches or parents when

participants had to perform certain tasks:

> Allen (V-T): Coach is like, "Okay, you go here, you go here, you go here." We won't get to play with our friends, and I guess in an aspect that's good because then he's introducing us to the JV players, but we don't want that sometimes.

The second cause of *relatedness frustration* was associated with the training or

competition environments in which participants perceived a lack of effort or support from

specific team or teammates, particularly non-varsity athletes.

> Kobe (JV-FB): This last week, like I said, we had a practice on a day of school. We didn't have school that day, and during team, whenever varsity goes off with varsity and JV goes off with JV. We started off this season I think with 36 players, and now we can barely get 22 to practice so we can have 11 on each side of the ball to at least, you know, and um, especially, um, you know, I'm a linebacker I've had to move up and I'd have to play guard and tackle a couple of times, just so we can have people in positions and it's just um, like I said, there's just not enough dedication between my class.

Motivational Regulations and Outcomes

Despite not being the focus of the study, participants' responses to perceived

motivational climates and basic psychological needs revealed information relevant to the

categories motivation in sport and motivational outcomes.

·   Motivation in sport – In terms of participants' motivational regulations in sport, the

19 meaning unit consisted of all six types of motivational regulations except *introjected*

regulation. *Intrinsic motivation* was manifested in participants' enjoyment of the sport and the

competition (e.g., "That's the whole version I really like football is for the love of the game, and

then the Brotherhood" [Joe, V-FB]). *Integrated regulation* was mentioned by four football

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players on the same team and a track athlete. The football players discussed their identity and values of playing footballs for their whole life:

> Ethan: Cause that's one of the biggest things is, you know, playing with them my whole life is all I do, it's all we've done. And it's going to be kind of weird if we didn't give it our all. And like us playing together for so long has really brought out who everyone is. Like when we're all together, there is just an energy there that will never amount up to anything we do. You know, like if we hang out together after the football season ends, you know, nothing is really going to bring that same energy before a game with each other. You know, if we go play laser tag, there is not gonna be the same feeling as if we're getting ready to go play a football game together. And like that's just one of the, the things I think we're all trying to hold on to for as long as we can because once this season is over a piece of everyone is definitely going to be gone. (Moves hands together)

> Terry: Cause this has been our life for, this has been our life, I mean this is all we've ever done, all we've ever focus on.

In contrast, *amotivation* was expressed the participants through their reduced enjoyment and desire to play the sport (e.g., "it's just the repetition, just got so tired and boring, and it's probably why I didn't wanna play more, cause I got tired of it" [Kyle, JV-BB]). While the code *amotivation* had the highest frequency counts (6) among motivational regulations, the frequency of *intrinsic motivation* (5) and *integrated regulation* (5) codes was unexpectedly high. Indeed, participants' responses also demonstrated that athletes might had a mix of adaptive and maladaptive motivational regulations in their sport participation:

> Daima (JV-TF): Sometimes, sometimes I'm like, uh, "they're too fast." Like "I'm too…" like "I can't do this," you know? But like "there's no point" or whatever, but at the same time it's like, "No this is fun for me, like I enjoy this, if I'm not good at it (Shrug shoulders), like you know I'm still gonna do it because I enjoy it.

· Motivational outcomes – Participants mentioned 26 meaning units including both positive and negative outcomes in reference to their sport participation. Of the nine meaning units of positive motivational outcomes, five were in the sport domain such as intention to continue sport (e.g., "have a scrimmage, and hype up the competition, um, just do something to get our adrenaline pumping and get ready for the season and what not, but uh, like when we

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would scrimmage made me wanna like keep playing" [Kyle, JV-BB]) and four were in non-sport

domains (e.g., "because they get you like mentally conditioned, mentally focused about

everything you got to do" [John, JV-FB]).

With respect to negative outcomes, all 17 meaning units were in the sport domain,

including *burnout* (9) and *dropout from sport* (7). Participants expressed their burnout mostly in

the form of physical exhaustion (8), such as "I think it's just like the way basketball is, it's just

like very tiring on your body" (Kyle, JV-BB), followed by sport devaluation (3) and reduced

accomplishment (1). In discussing their intention to drop out of their sport, (a) one varsity

football player, one JV football player, one varsity tennis player, and one varsity track athlete

indicated their intention to drop out due to tiredness or fear of injury; (b) one JV football player

indicated his plan to drop out because of a focus on academics and the fear of injury; and (c) two

JV football players indicated their determination to drop out:

> Jose (JV-FB): I'm done. Just too much to deal with coaches, schedules and just all that.
> Your physical ... your physical being, you know, just because if you get hurt, like if
> something happens then you're done. You know, like you can get paralyzed and all that,
> and that's kind of what scares me and then that's what my parents don't understand but ...
> Yeah, I'm not going to be playing football anymore. Yeah. (looks frustrated)

Group Differences

The frequency analysis by gender, team type, and dropout intention showed several

differences in the prevalence of codes across groups (see Table 23).

· Gender differences – Boys described a larger ratio of coach-created empowering

climate to disempowering climate, but smaller ratios of peer-created and parent-created positive

climate to negative climate than girls. Regarding the relative motivational influence, a larger

proportion of boys than girls indicated coaches or parents as their most positive influence and

teammates as their most negative influence, whereas a larger proportion of girls than boys indicated teammates as their most positive influence and coaches as their most negative influence. Additionally, boys mentioned a larger ratio of need satisfaction to need frustration than girls. Specifically, boys expressed much greater incidence of relatedness satisfaction, although they also expressed much greater incidence of autonomy frustration and relatedness frustration as compared to girls. In terms of parental involvement, boys described greater incidence of parents with moderate involvement as well as overinvolvement and less incidence of parents with underinvolvement than girls.

Comparing the responses to need satisfaction and need frustration between boys and girls, one pattern that emerged was the greater influence, both positive and negative, of authority figures in satisfaction and frustration of autonomy and relatedness needs for boys than girls. The cooccurence of relatedness satisfaction and autonomy frustration with coaches and fathers were especially prominent in boys. In addition to the aforementioned examples in coach-created and parent-created motivational climates and basic psychological needs, the following is another example from a boy that showed this mixed pattern of need satisfaction and frustration with authority figures:

> Tim (V-T): Um, my mom and dad, they're both very supportive. Sometimes my dad can be critical of me when I play, but I understand it's coming from good intention. He's just trying to help me out, so I understand that, but, um, yeah, sometimes I just feel the pressure a little bit, but I us- I get used to it sometimes because I know they want me to do well, so, um, yeah.

Another pattern that emerged was the greater influence, both positive and negative, of authority figures in satisfaction and frustration of competence needs for girls than boys. In addition to the aforementioned examples in coach-created and parent-created motivational

climates and basic psychological needs, the following is another example from a girl that showed the influence of authority figures in competence satisfaction and frustration:

> Karen (JV-SB): I feel like the, like the assistant coaches, or like the junior coaches. I feel like they're just kinda... like... damning the players. They just have more like a negative effect on me. I just feel like they make the sport a little less enjoyable. And then like head basketball coach comes in, it's like "Oh, look how good you're doing! You're doing so good! Guys, look, everyone should be working this hard!" She like, points out like all the good stuff that you do. And then when you mess up, she tries to like make it somewhat like "It's okay. It's not that big of a deal." (Teresa & Evelyn smile)

· Differences across team type – The comparison of participants across varsity, JV, and freshman teams yielded several major differences in the frequency of their codes. In terms of participant perceptions of motivational climates across team type, (a) varsity athletes mentioned the largest ratio of peer-created positive climate to negative climate and the smallest ratio of parent-created positive climate to negative climate; (b) JV athletes mentioned the smallest ratio of coach-created empowering climate to disempowering climate and peer-created positive climate to negative climate; and (c) freshman mentioned the largest ratio of coach-created empowering climate to disempowering climate and parent-created positive climate to negative climate. When comparing their relative motivational influence, the proportion of most positive influence was comparable across team type; examination of most negative influence showed that a larger proportion of varsity than JV and freshman athletes indicated coaches as their most negative influence, and a larger proportion of JV and freshman than varsity athletes indicated teammates as their most negative influence.

Furthermore, varsity mentioned the largest ratio and JV mentioned the smallest ratio of need satisfaction to need frustration. Specifically, varsity athletes expressed much greater incidence of both competence and relatedness satisfaction, although they also expressed much greater incidence of autonomy frustration as compared to JV and freshman athletes. JV athletes

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expressed greater incidence of both competence and relatedness frustration than varsity and freshman athletes, while freshman athletes expressed low incidence of both need satisfaction and frustration in general. Comparing the parental involvement across team type, varsity athlete described the greatest incidence of parents with overinvolvement, JV athlete described the greatest incidence of parents with underinvolvement, and freshman athlete described the greatest incidence of parents with moderate involvement.

Further investigation of the codes for JV athletes demonstrated a consistent pattern of the most negative perceptions of peer-created motivational climates, most negative motivational influence from peers, and the greatest incidence of competence and relatedness need frustration, all of which were evidenced by participant responses across gender, sports, and schools. In addition to the aforementioned examples in peer-created negative climates and psychological need frustration, the following are two more examples from different genders, sports, and schools related to this negative pattern of peer influence:

> Melissa (JV-BB): Like, there's that one player that like everybody is like angry at for some reason. Like they don't need to be in the game, because they're always like going rogue in a way. Like you are supposed to run a specific play... but then that one person doesn't want to... and so it's like messing up with the team function. Like the team is supposed to work together, and that one person like steps out, and it's like "No, I wanna do my own thing." And so, like, for the rest of the game... the team is kinda just like mad at that person. They're like "Well, we don't wanna give you the ball, cause you're going to go rouge." And so if you're like... that one person cannot like mess it up for everybody. (Karen and Teresa nod)

> Gerald (JV-FB): Like during the beginning it was real ... I don't know about the other teams, but JVB, it was really bad. Like the teammates were ... during the games even, they were just ... they would bring you down, like you, like, not like depressed but it would just totally kill your mood, your motivation. Because they... first of all, they didn't really show that much respect, like they would have like their own certain people that they would show respect to, instead of just everyone in the team being a team. (sounds angry)

· Differences across dropout intentions – The comparison of the participants with relatively higher intention to drop out to those with relatively lower intention to drop out revealed some minor differences in the coding frequency. The higher dropout intention group described a larger ratio of parent-created positive climate to negative climate but smaller ratios of coach-created empowering climate to disempowering climate than the lower dropout intention group. The ratio of peer-created positive climate to negative climate was similar between the groups. Regarding the relative motivational influence, a larger proportion of the higher dropout intention than the lower dropout intention group indicated parents as their most positive influence and coaches as their most negative influence, whereas a larger proportion of lower dropout intention than the higher dropout intention group indicated coaches or teammates as their most positive influence and teammates as their most negative influence. Unexpectedly, the higher dropout intention group mentioned a larger ratio of need satisfaction to need frustration than the lower dropout intention group. Additionally, the two groups described a similar incidence of parents with underinvolvement, moderate involvement, or overinvolvement.

Further examination of the codes for the higher dropout intention group demonstrated a consistent pattern of more competence need frustration and less competence satisfaction with coaches as compared to the lower dropout intention group. On the other hand, the source of competence frustration for the lower dropout intention group was more attributable to peers, parents, or even their own sport performance. The lower dropout intention group revealed a consistent pattern of more positive perceptions of coaches despite some of their controlling behaviors. These positive perceptions stemmed from athletes' understanding of coaches and desire of being pushed to improve skills, which might facilitate their motivation and intention to continue sport under other negative influence from social agents such as peers. In addition to the

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previously mentioned examples in mixed perceptions of coach-created climates, the following

are two more examples from different genders, sports, and schools that illustrate some

contrasting perceptions of coaches between the higher and lower dropout intention groups:

> Joe (higher dropout intention): I mean they (coaches) made me lose love for the game but they didn't make me lose love for the brotherhood, um, but uh, I feel like.. I feel like certain kids definitely should still be here and they're not... And um, really kind of disappoints me.

> Ethan (lower dropout intention): It's not always about getting what you want.

> Kobe (higher dropout intention): Um, you know I definitely agree that you know, coaches do burn you out, and um, it depends more on the coach I think. You know there are some coaches that you know, I think you know legitimate more than just coaches. But then there are some coaches um that really make me go home and wonder "Do I want to show up to practice tomorrow?"

> Ethan (lower dropout intention): I kind of feel like uh... what was I thinking… I feel like sometimes, it's a military zone like in the off season. They, they, they want to see who's going to quit. They, they, they try to push you to see who will drop out because you, you know, you don't want to put effort in to kids who aren't going to pull through for you, and, and so I think that's why so many people get burned out. Is because for one, they don't know why... or uh... how the coaches... or why the coaches are doing what they're doing, and because two they just don't want to handle it, they don't want to go through the pain and the process, because it does suck and it isn't fun. But that's one of the main keys of why they do it is so they don't put their energy and time into kids who won't (inaudible) for us.

> Ashley (lower dropout intention): Like on JV, we're like obviously, like not all like good, you know, not as good as varsity, but like sometimes they'll be a girl like catching, and Coach W will be like, "She can't catch." (laughs) And then Coach S like, "Shh," and I just think it's like someone said it like... not in a mean way.

> Lori (lower dropout intention): I don't feel like it's a mean way like either. I just feel like he's just like using that to push us more. Like I mean, I'm pretty sure whoever told that person, she's gonna wanna be able to catch later on, like get better at it.

> Megan (higher dropout intention): It's like harsh motivation.

> Emma (lower dropout intention): I like that though. I like it better…

Discussions

The primary purpose of this mixed-method study was to examine the underlying
motivational processes from social environments created by coaches, peers, and parents to
motivational outcomes in high school athletes using a QUAN➔QUAL research design. The
framework of SDT, accompanied by AGT, was used to explain the findings of the quantitative
and qualitative parts of the study, as well as mixed-methods comparisons.

Quantitative Findings

Although the hypothesized comprehensive model (see Figure 2) was a poor-fitting model,
both alternative hypothesized "brighter side" (see Figures 3 & 7) and "darker side" (see Figures
4 & 8) models achieved adequate fit to address the hypotheses in the quantitative part of this
study. The variance explained in the variables and the strengths of the path coefficients support
the notion of distinct relationships between the brighter and darker sides of motivation and
athletic experience (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Ryan &
Deci, 2000a; Vansteenkiste & Ryan, 2013). Specifically, the positive social environments and
need satisfaction explained more variance in autonomous motivation than controlled motivation
and amotivation in the brighter side model, while the negative social environments and need
frustration explained more variance in controlled motivation and amotivation than autonomous
motivation. In addition, the paths from autonomous motivation to subjective vitality (positive
outcome) and from amotivation to burnout (negative outcome) were the strongest paths for these
two motivational outcomes (see Figures 7 & 8).

> Hypothesis 1: Greater coach-created empowering climate, peer-created task-involving
> climate, and parent-created task-involving climate would predict greater need
> satisfaction, which would in turn predict higher levels of adaptive motivation and
> outcomes as well as lower levels of maladaptive motivation and outcomes.

The first hypothesis was partially supported in the overall sample, as well as across gender and team type. While coach-created empowering climates positively predicted satisfaction of all three basic psychological needs in the overall sample, peer-created and parent-created task-involving climates only predicted their relatedness and competence satisfaction, respectively. These significant predictions might somewhat stem from the measures used in this study. Specifically, the constructs of an empowering climate consist of both SDT and AGT facets that might relate closer to satisfaction of all three basic psychological needs (Appleton et al., 2016; Duda, 2013; Reinboth et al., 2004). On the other hand, the measure of peer-created task-involving climate consists of improvement, effort, and social support items that appear to emphasize competence and relatedness satisfaction to a larger extent (Ntoumanis & Vazou, 2005; Vazou et al., 2005), and the measure of parent-created task-involving climate consists of learning orientation that addresses mostly competence satisfaction (White, 1996; White et al., 1992).

Both coach-created empowering and peer-created task-involving climates had indirect effects on burnout through relatedness satisfaction and then amotivation. The indirect effect of coach-created empowering climate in particular was the strongest indirect path to burnout. This finding, consistent with the SDT-based sport studies (Allen, 2006; Reinboth et al., 2004), suggests that feeling connected and belonged to the team is more associated with lower amotivation than higher intrinsic motivation or autonomous motivation. This positive mechanism helps prevent burnout, especially since amotivation is the motivation type that is the most correlated with burnout in general as well as burnout symptoms (Li et al., 2013).

An empowering climate had indirect effects not only on burnout, but also on subjective vitality, through competence satisfaction and then autonomous motivation. The significant

mediating roles of competence and autonomous motivation are congruent with previous research that showed competence and intrinsic interest/enjoyment as the most important predictors of positive motivational outcomes and continuation in sport and physical activity (Chu, Zhang, & Cheung, 2017; Kipp & Weiss, 2015; Teixeira, Carraça, Markland, Silva, & Ryan, 2012). Although parent-created task-involving climate did not have a significant indirect effect on motivational outcomes through competence satisfaction, it had a significant direct effect on subjective vitality. Therefore, parents' encouragement for improvement and enjoyment is directly related to physical and psychological well-being of the athletes while playing the sport.

Although an empowering climate predicted autonomy satisfaction, deviating from the SDT tenets (Deci & Ryan, 2000b; Ryan & Deci, 2017), autonomy satisfaction did not predict any motivation types in the overall sample.[4] The nonsignificant role of autonomy in this study might be attributed to incomprehensive assessment of autonomy in the existing measure that only focused on one of the three autonomy components—perceived choices (Ntoumanis, 2001; Taylor & Lonsdale, 2010). Reeve, Nix, and Hamm (2003) conducted three studies in an educational setting, which revealed that the internal locus and volition components of autonomy were more important than perceived choices in predicting self-determination. Therefore, measures that address all three autonomy components should be developed for future research. In addition, controlled motivation was not predicted by any need satisfaction or predicted any motivational outcomes in the overall sample, which might be due to the negative variables in the brighter side model that were not as strong as positive variables in predicting motivational outcomes. Indeed, many previous studies on subjective vitality, burnout, and dropout in sport contexts used a single variable of self-determination or intrinsic motivation for their SEM

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[4] Only in boys' model, autonomy satisfaction did predict controlled motivation, which in turn predicted burnout.

models (Alvarez et al., 2012; Harris & Watson, 2014; Jõesaar et al., 2011; Jõesaar, Hein, & Hagger, 2012), which implied that controlled motivation might not be a significant predictor of these motivational outcomes on its own. A meta-analysis of burnout predictors also indicated that the association between controlled motivation and burnout was trivial (Li et al., 2013). This evidence suggests that controlled motivation may not necessarily lead to maladaptive outcomes in sport contexts that emphasize performance as an external drive for athletes to continue participation in sport.

> Hypothesis 2: Greater coach-created disempowering climate, peer-created ego-involving climate, and controlling parental behavior would predict greater need frustration, which would in turn predict higher levels of maladaptive motivation and outcomes as well as lower levels of adaptive motivation and outcomes.

The second hypothesis was partially supported in the overall sample, as well as across gender. The models for the two team types were invariant, and thus would be interpreted as the same as the overall model. While coach-created disempowering climate positively predicted frustration of all three basic psychological needs in the overall sample, parent-created ego-involving climate predicted competence and relatedness frustration, and peer-created ego-involving climate only predicted competence frustration. Similar to the brighter side model, some of the differences across these significant predictions might somewhat stem from the measures used in this study.

Compared to the brighter side model, the darker side model had more significant paths. This phenomenon might be due to having two maladaptive outcomes and only one adaptive outcome in the models, as negative motivational factors tends to predict negative motivational outcomes more strongly (Vansteenkiste & Ryan, 2013). Both coach-created empowering and parent-created task-involving climates had indirect effects on burnout just through competence frustration, through competence frustration and then autonomous motivation, and through

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competence frustration and then amotivation. Therefore, competence frustration had the strongest mediating role among the three basic psychological needs as supported by previous evidence (see Li et al., 2013). Furthermore, parent-created ego-involving climate had another indirect effect on burnout through relatedness frustration and then amotivation. In terms of all motivational outcomes including burnout, a disempowering climate had indirect effects on all of them through competence or autonomy frustration and then autonomous motivation, while parent-created ego-involving competence had indirect effects on all of them through competence or relatedness frustration and then autonomous motivation. Because little is known about how the social environments created by these three social agents together predicted need frustration and motivational outcomes, this finding of this study provided initial evidence for further investigations.

While competence frustration shared a common mediating role, autonomy frustration and relatedness frustration had a unique mediating role, respectively, for parent-created and coach-created climates. Therefore, when coaches are disempowering and parents are ego-involving, athletes are very likely to feel incompetent and inadequate in their sport participation, which can in turn be related to lower autonomous motivation and higher amotivation, as well as lower physical and psychological energy, more burnout symptoms, and greater dropout intentions. Regarding the role of relatedness frustration, it seems reasonable that when parents focus on their child athlete performing better than others and make the athlete worry about failing and making mistakes, the child athlete may feel disapproved and rejected in the sport experience, which was associated with less interest, motivation, and sense of accomplishment in participation. In contrary to SDT and the second hypothesis, autonomy frustration positively predicted autonomous motivation. A very plausible reason is that there were errors in the parameter

estimation (i.e., wrong sign) due to multicollinearity among three psychological needs (Grewal et al., 2004), because the bivariate relationships between autonomy frustration and autonomous motivation were negative across boys, girls, varsity athletes, and non-varsity athletes (see Tables 5 & 6).

Similar to the brighter side model, controlled motivation was not predicted by any need frustration or predicted any motivational outcomes in the overall sample. However, coach-created disempowering and parent-created ego-involving climates had a direct effect on controlled motivation, accounting for 32% of the variance of controlled motivation in the model. This evidence suggests that coaches' and parents' emphasis on performance and winning are likely to be a source of external reward and pressure as for athletes to continue participation in sport.

> Hypothesis 3: The relative influence of coach-created motivational climate would be the strongest, and the relative influence of parent-created motivational climate would be the weakest in satisfaction and frustration of basic psychological needs and, in turn, positive and negative motivational outcomes.

The third hypothesis, as well as the literature review for this study, regarding the relative motivational influence of the three social agents was partially supported. The hypothesized relative influence held true for the brighter side, in that coaches contributed the most and parents the least to three need satisfaction directly and, in turn, to adaptive motivation and outcomes indirectly. However, as the hypothesized relative influence for the darker side was supported by the strongest negative influence of coaches only in autonomy frustration and burnout, parents had the strongest instead of the weakest influence in relatedness frustration and other motivational outcomes. The most positive influence of coaches in this study is consistent with the fact that coaches, as the most important social agent who design practice sessions and provide training and feedback to athletes, usually can "motivate" them (Alvarez et al., 2012). In

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contrast, the most negative influence was from parents instead of coaches. Since there are no studies, to my knowledge, on the influence of parent-created climates in motivational outcomes through basic psychological needs, this finding provides new evidence for further examination in future SDT-based studies in sport contexts. However, the qualitative findings from interviewing former high school athletes and parents of current high school athletes revealed that most parents "support" or pressure athletes using compliance-gaining techniques (Turman, 2007), which seem consistent with the most negative influence of parents in athletes' motivational processes and outcomes.

Noninvariance across Gender and Team Type

Gender noninvariance was established in both the brighter and darker side models. The positive climates created by coaches, peers, and parents altogether explained 11–43% of variance in boys' need satisfaction and 15–58% of variance in girls' need satisfaction, with the most variance explained in relatedness satisfaction for both genders. The negative climates created by coaches, peers, and parents altogether explained 18–32% of variance in boys' need frustration and 62–69% of variance in girls' need frustration, with the most variance explained in autonomy frustration for boys and competence frustration for girls. In general, satisfaction and frustration of psychological needs are more associated with social environments, particularly negative motivational climates, for girls than for boys.

Based on the effects of social environments on athletes' psychological needs, girls are more vulnerable than boys to controlling and ego-involving behaviors of coaches who can thwart their autonomy and relatedness needs. On the other hand, boys are more vulnerable than girls in ego-involving cues from their parents who can thwart their competence and relatedness. Both of

these mechanisms can lead to maladaptive motivation and outcomes. These differential

mechanisms might stem from athletes' sport socialization experience due to their gender.

Specifically, boys are more exposed to controlling and ego-involving behaviors of coaches and

may adapt to them by the time they are in high school, whereas girls are more exposed to task-

involving ones (Vazou, 2010), which may make girls more vulnerable and frustrated when

perceiving a disempowering climate created by coaches. Moreover, high school girls are more

likely than boys to evaluate their competence based on coach feedback (Horn, Glenn, &

Wentzell, 1993), so girls may perceive coaches' disempowering comments and behaviors as

more threatening and frustrating than boy may. This differential perception of coach influence is

also evidenced by the focus group interview of this study, in which boys mentioned that they

understood why coaches had certain controlling and ego-involving behaviors, and girls expressed

dissatisfaction and frustration toward coaches' negative comments in general. Conversely, due to

gender socialization in sport participation (Fredricks & Eccles, 2002), parent-created ego-

involving climate may create more pressure for boys than for girls to perform or participate in a

sport, which produces more negative influence on basic psychological needs and, in turn, well-

being, burnout, and dropout intentions in boys than in girls (Amado et al., 2015).

Regarding motivational outcomes, the most positive influence and negative influence of

the social agents in both the adaptive and maladaptive outcomes were the same as in need

satisfaction and frustration for boys, but not for girls. Whereas disempowering climates still

consistently had the most negative influence in girls' motivation and outcomes, peer-created

task-involving climate can be considered as having the most positive influence, specifically in

adaptive motivation and burnout, both directly and indirectly through relatedness satisfaction.

This finding implies that when the team environment is more focused on putting forth effort and

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supporting one another to improve instead of comparing performance among teammates or with other teams, athletes tend to feel more belonged, are more autonomously motivated, and have less burnout symptoms. This strong positive influence is in line with the evidence that high school girls tend to draw upon improvement and teammate feedback for perceived competence in sport (Horn et al., 1993). On the other hand, empowering climates had the most influence in girls' physical and psychological energy in sport participation, while parent-created task-involving climate had the most positive influence for girls to continue sport participation rather than drop out.

With respect to the motivational processes across team type, noninvariance was established in the brighter side, but not the darker side model. This result suggests that the negative social environments created by the social agents have similar influence in both varsity and non-varsity athletes' motivational outcomes, whereas the positive social environments have effects on their motivational outcomes differentially across the competition level.

Qualitative Findings

The follow-up qualitative part of this study explored "how" beyond "what" coaches, peers, and parents create social environments that influence satisfaction and frustration of psychological needs and motivational outcomes in a nested sample of athletes who showed high levels of negative motivational outcomes in the quantitative survey. Because these athletes had high amotivation, burnout symptoms, and/or intention to drop out, the qualitative findings have direct implications on creating interventions that address more optimal social environments to support their psychological needs and improve their motivational outcomes. The qualitative results were discussed by addressing the four qualitative research questions, as well as referring

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to the quantitative findings for triangulation and elaboration that led to mixed-methods integration (Horn et al., 1993).

> Research Question 1: What kinds of coach-created environment and specific coaching behaviors were protective factors and risk factors for negative motivational outcomes, respectively?

Based on the frequency analysis of the deductive codes in the category of coach-created empowering climate, relatedness-supportive climate is deemed the strongest protective factor for negative motivational outcomes, followed by task-involving and autonomy-supportive climates in coach-created environment. Based on the brighter side model in the quantitative part of this study (see Figure 7), coaching behavior and strategies associated with these climates can satisfy all three psychological needs of high school athletes.

In creating a relatedness-supportive climate, the qualitative findings suggest that non-instructional conversation with athletes seem to be a particularly helpful strategy that can facilitate relatedness and prevent maladaptive motivational outcomes in high school athletes. Coaches are recommended to develop relationships with their athlete both on and off the sport arena. This strategy coincides with the findings from previous qualitative research related to coaching. A longitudinal qualitative study on burnout showed the importance of significant social support both inside and outside the sport for athletes who did not experience burnout (Cresswell & Eklund, 2007), while another qualitative study on coaching and parental influence revealed the positive influence of an interdependent coach-athlete relationship with closeness (e.g., respect), commitment (e.g., satisfaction) and complementarity (e.g., supportive roles) in adaptive motivational outcomes (Jowett & Timson-Katchis, 2005). To promote a task-involving climate, the strategy of emphasizing task-focused competence feedback may be particularly helpful in satisfying competence of high school athletes. It is worthy of note that the feedback

should be specific and task-focused, rather than general statements such as "good job" or "way to go." To facilitate an autonomy-supportive climate, acknowledging feelings and perspective of high school athletes is deemed important. This strategy may be difficulty to implement at times, because coaches and athletes are in a system with differential power dynamics and hierarchies that require coaches to act like an authority figure most of the time. Coaches may learn to empathize with athlete or simply listen without judgment in order to support athletes' autonomy and adaptive motivational outcomes.

Regarding the darker side, the frequency analysis of the deductive codes in the category of coach-created disempowering climate suggests that controlling coaching behavior is the most frequently mentioned risk factor for negative motivational outcomes. Based on the darker side model in the quantitative part of this study (see Figure 8), the coaching behavior and strategies associated with these climates tend to thwart autonomy and competence of high school athletes. To reduce controlling coaching behavior, avoid devaluing athletes' perspective seems to be a priority. In terms of an ego-involving climate that also contributes to a disempowering climate, recognizing superior and inferior ability is most likely thwart athletes' competence and also relatedness needs. These ineffective coaching strategies are aligned with athletes who attributed their negative burnout experience to the pressure to comply with demands and a lack of position security in previous research (Cresswell & Eklund, 2007), while another qualitative study on coaching and parental influence revealed the positive influence of an interdependent coach-athlete relationship with closeness (e.g., respect), commitment (e.g., satisfaction) and complementarity (e.g., supportive roles) in adaptive motivational outcomes (Jowett & Timson-Katchis, 2005).

The focus group interviews of this study implies that high school athletes have very

different opinions about coaches as to whether they are perceived as empowering or disempowering. Some of the athletes, especially boys and football athletes, seem to understand and accept the negative comments from and favoritisms of coaches, whereas other athletes may not. Therefore, it is crucial for coaches to explore the culture of their team and the individual characteristics of their athletes in order to create optimal environments to promote positive motivational outcomes. Although the high school athletes did not expect coaches to support their autonomy, their negative motivational outcomes were related to coaches thwarting their autonomy, also competence and relatedness in some occasions, by forcing them to perform behaviors with which the athletes do not agree. Therefore, coaches should at the very least try not to exhibit controlling behaviors if they have yet to master how to create empowering climates. Moreover, it appears that some simple explanations and trust-building techniques in communication could help high school athletes understand coach perspectives and perceive them as more empowering. The interviewees usually described their understanding towards coaches' request when coaches explained the "why" with an intention to improve athletes' skills and performance. These expectations once highlight the importance of trust, respect, belief, and open communication from coaches to help athletes reduce burnout and negative experiences in sport (Cresswell & Eklund, 2007; Jowett & Timson-Katchis, 2005).

> Research Question 2: What kinds of peer-created environment and specific teammate behaviors were protective factors and risk factors for negative motivational outcomes?

Based on the frequency analysis of the deductive codes in the category of peer-created positive climate, task-involving and relatedness-supportive climate are deemed to serve similar role as protective factors for high school athletes' negative motivational outcomes. In contrast, autonomy-supportive behaviors of peers do not seem to play a role in athletes' motivational outcomes, maybe because they are not an authority figure. This may also be the reason why

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autonomy support items were problematic and not be included in the study measure of peer-created motivational climate (Vazou, Ntoumanis, & Duda, 2006).

In creating a task-involving climate, the frequency analysis of the underlying codes indicates the importance of having teammates who put forth effort and emphasize improvement as individuals and as a team, with encouragement of team leaders and coaches, to facilitate satisfaction of relatedness (and competence), which can in turn reduce amotivation and burnout symptoms based on the brighter side model. A relatedness-supportive climate perceived by the athletes focused on fostering the feeling of belonging and being part of a group, particularly the creation of a friendly atmosphere on the team, which also contributed to a task-involving climate (Vazou et al., 2006).

Regarding the darker side, the frequency analysis of the deductive codes in the category of peer-created negative climate suggests that an ego-involving climate is the dominant risk factor for negative motivational outcomes. Referring to the darker side model in the quantitative part of this study (see Figure 8), an ego-involved climate tends to thwart the competence of high school athletes. Similar to the non-dominant role of autonomy support from teammates, controlling behaviors have larger influence in motivation because they are not an authority figure. To alleviate this negative mechanism, based on the qualitative results, reducing intra-team conflict—unsupportive behaviors among teammates is crucial. Consistent with previous studies regarding peer conflicts among high school students (Storch & Masia-Warner, 2004), their negative influence was greater for girls than for boys in terms of competence and relatedness frustration in the darker side model. Previous research also shows these conflicts could lead to negative emotions and greater burnout symptoms (A. L. Smith, Gustafsson, & Hassmén, 2010), as well as poor team performance (Partridge & Knapp, 2016). According to Holt, Knight, and

Zukiwski (2012), there are two types of conflicts that coaches and team leaders can help reduce: (a) performance conflict that is related to task execution (e.g., playing time); and (b) relationship conflict that is related to interpersonal interactions inside or outside of sport (e.g., racial division). The interview responses revealed that both types of conflicts were prevalent among high school athletes experiencing negative motivational outcomes, although performance conflicts was more frequently mentioned by participants. Both boys and girls expressed intra-team conflicts across class (i.e., from freshman to senior) in the interview, which supports the fact that conflicts may readily come from subgroups within team structures (Partridge & Knapp, 2016). Some recommended strategies to reduce these intra-team conflicts include scheduling team building activities within sport practices and organizing team social events beyond sport practices (Gould, Collins, Lauer, & Chung, 2007; Partridge & Knapp, 2016).

Similar to previous research evidence (García-Calvo et al., 2014; Vazou et al., 2006), both the brighter side and darker side models in the quantitative findings revealed a high positive correlation between coach-created climates and peer-created climates. It was also evidenced in several focus group participants' statements that showed coaches' favoritism and teammates' respect toward the best athletes on the team rather than equal treatment across the whole team. Therefore, how coaches use strategies to structure a team and create team culture has a large influence on how athletes interact with one another on the team, both positively and negatively.

Research Question 3: What levels of parental involvement and specific parental behaviors were protective factors and risk factors for negative motivational outcomes?

Based on the frequency analysis of the deductive codes in the category of parent-created positive climate, relatedness-supportive climate is deemed the strongest protective factor for negative motivational outcomes, followed by autonomy-supportive and task-involving climates. These climates were manifested through verbal and non-verbal behaviors in participants'

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responses, while most of these descriptions were more abstract than those of coach-created and peer-created climates. Parental behaviors that support autonomy and relatedness in the focus groups stemmed from the parents' ability to consider athletes' thoughts and feelings by taking their perspectives. Moreover, these behaviors seem to be more parenting in general rather than only in sport. On the other hand, parent created task-involving climate was mostly represented by meaning units that were associated with self-improvement. The quantitative brighter side model suggests that when parents could focus on this self-improvement instead of social comparison regarding their high school child's sport performance, it would lead to greater competence satisfaction and physical and psychological energy in the child's sport participation.

Regarding the darker side of parent-created environment, controlling behavior is the dominant risk factor for negative motivational outcomes. Congruent with previous qualitative studies, focus group participants mentioned their parents' negative and derogatory comments as the main theme of the controlling parental behavior (Holt et al., 2008; Holt, Tamminen, Black, Mandigo, & Fox, 2009). These controlling behaviors usually come from parents, mostly fathers, who are highly involved in their child athlete's sport participation and unintentionally thwart their autonomy (Holt et al., 2009), or even competence and relatedness. These negative climates and behaviors, paired with overinvolvement of parents, could further diminish sport enjoyment, as well as cause stress, performance anxiety, and burnout (Bremer, 2012; Lee & MacLean, 1997; McCarthy & Jones, 2007). On the other hand, underinvolvement of parents seems to also lower high school athletes' involvement and continuation in sport. According to the focus group participants, parental underinvolvement is often related to parental concerns over academics, which could lead to sport devaluation among athletes. Not only do parental overinvolvement and controlling behavior negatively affect athletes' motivational outcomes, but they can also present

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additional challenges to coaches who need to involve parents and set boundaries at the same time in coaching the child athlete (Gould et al., 2007; Jowett & Timson-Katchis, 2005). Some effective coaching strategies to facilitate more supportive parental behaviors include organizing parents' nights to communicate with parents on the expectations of their involvement and team dinners that build rapport and trust among athletes, coaches, and parents (Gould et al., 2007; Hellstedt, 1987).

With respect to ego-involving climates, the qualitative findings only constituted a worry-conducive climate, but not a success-without-effort climate, which was in agreement with the quantitative CFA model for an ego-involving climate that did not include success without effort. Previous research also indicated much higher associations between a worry-conductive climate and burnout symptoms than between a success-without-effort climate and burnout symptoms among high school-aged athletes (Gustafsson, Hill, Stenling, & Wagnsson, 2016). Although it is plausible that the parents of this sample did not believe in success without effort, this phenomenon might also be attributed to less involvement of many parents during high school years (Jowett & Timson-Katchis, 2005). While parental climates may be actively influenced by the tangible behaviors of parents, they can also be passively perceived by the athletes. For instance, family sport pressure is common and represents the negative perceptions of having to be as good as another family member who also play or played the sport. This pressure may happen more in same-gender dyads (e.g., father–son, mother–daughter).

In congruence with the literature on parental involvement (see Bremer, 2012; Knight, Berrow, & Harwood, 2017), moderate involvement was associated with the most positive parental perceptions based on the focus group responses. One key to maintain a moderate involvement is to try not to coach the child athlete during competition or talk to him/her right

after competition. Although competition attendance helps foster the perceived support, conversations about the competition performance could trigger perceived pressure from parents.

Research Question 4: Were there any differences in the perceptions of the "darker side of athletic experience" (i.e., negative social environments and need frustration) across gender, sport type, and competitive level? If so, how were they different?

Differences were shown both across gender and team type from the codes and categories in participants' interview responses. Specifically, boys who experienced negative motivational outcomes reported larger ratio of empowering to disempowering climates created by coaches than girls who experienced negative motivational outcomes. Although little research has investigated gender differences in the darker side of SDT within sport contexts, past studies within school contexts suggest that teachers tend to be more supportive and warmer toward students for whom they hold higher expectations (Meece, Glienke, & Burg, 2006). For instance, teachers expect boys to perform better in "male-type" subjects (e.g. math, physical education) than girls and thus provide boys with more support for success and better motivational outcomes. This gender difference was consistent with the quantitative findings and corresponding discussions on gender socialization in sport (Fredricks & Eccles, 2002). This may also be the reason why the majority of the girls who experienced negative motivational outcomes described their coach as the most negative social agent in this study. Interestingly, these coaches were female coaches from whom the athletes stated receiving differential treatment. This finding is in the contrary to previous research evidence regarding female coaching being more task-involving (Vazou, 2010). Future research may investigate whether the favoritism comes from objective behaviors of female coaches or perceptions of certain athletes, particularly those with greater negative motivational outcomes. These investigations can further the understanding of gender differences in coaching as well as in receiving coaching. Then, evidence-based guidelines for

coaching girls can be developed similarly to those for coaching boys (Gould et al., 2007).

Another major gender difference in the darker side of athletic experience was grounded in peer-created climates, which were perceived as much more positive by girls than boys who experienced negative motivational outcomes. This gender difference is also in line with the quantitative findings and provides triangulation in the differential motivational processes that lead to well-being, burnout, and dropout intentions in sport across high school boys and girls. The consistency between the quantitative and qualitative findings also implies that the mechanism that leads to the darker side of athletic experience is similar in all athletes and those experiencing high levels of negative motivational outcomes.

With regard to the qualitative findings across team type, varsity athletes who experience negative motivational outcomes reported much larger ratio of positive to negative perceptions of peer-created climates and larger ratio of negative to positive perceptions of parent-crated climates than non-varsity athletes. This difference across team type might stem from the fact that more competitive teams are usually more cohesive and supportive of teammates in order to achieve better performance, whereas parents may be more likely to be overinvolved and controlling due to their child athlete's competitiveness (Holt et al., 2008). Not only is there a difference between varsity and non-varsity athletes but also within non-varsity athletes— between JV and freshman athletes. Although the relative motivational influence of the social agents were generally the same for JV and freshman athletes who experienced negative motivational outcomes, JV athletes described much lower ratio of positive to negative climates created by coaches, peers, and parents as well as satisfaction to frustration of basic psychological needs than freshman athletes did. This result is deemed reasonable, because JV athletes who are burned out have participated in high school sport longer than freshman athletes and are more

prone to physical and emotion exhaustion, as well as a reduced sense of accomplishment after not making the varsity team. This within-group difference in non-varsity athletes may explain why invariance existed in the darker side SEM model in the quantitative part of the study. Future research may separate JV and freshmen for invariance testing given that the subsample sizes are large enough for doing so.

Mixed-Methods Comparisons

The quantitative and qualitative findings provided both overlapping and different aspects of the relative motivational influence of social agents in the brighter and darker sides of athletic experience. Therefore, this final section of the discussion includes consolidation of the two data forms to explain the similarities and differences across the quantitative and qualitative parts of the study (Bazeley, 2012).

Coach Influence

Both quantitative and qualitative findings (see Tables 20 and 21) show that coach-created motivational climates play the most important role in term of protective factors through empowering climates and risk factors through disempowering climates that contribute to burnout and dropout intentions in sport. This conclusion is supported by comparing the groups with higher to lower dropout likelihood in the focus group interviews. The higher dropout likelihood group showed smaller ratio of empowering to disempowering climates in the meaning units as well as greater number of most negative influence from coaches than the lower dropout likelihood group. Coaches contributed to relatedness satisfaction and competence and relatedness frustration, with unique contribution to autonomy satisfaction and frustration across groups. This finding also supports previous research on more influential role of coaches than parents in high

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school athletes' autonomy satisfaction and motivation (Amorose, Anderson-Butcher, Newman, Fraina, & Iachini, 2016). This influential role is especially prominent in boys whose perceived empowering climates were the only positive paths to competence and relatedness satisfaction as well. In contrast, empowering climates contribute to only autonomy satisfaction in girls and none of the need satisfaction in varsity athletes, which is consistent with the focus group responses regarding coaches as the most negative social agent for these two groups.

Freshman athletes was the only group that described more empowering than disempowering climates in the interviews. Future research may investigate further whether coaches actually create a different climate for freshmen, or it is the more positive perceptions of freshman athletes than JV and varsity athletes. It is plausible that freshman athletes have a more positive perception of coach-created climates because they have not participated in important competitions that coaches could be more disempowering (N. Smith, Quested, Appleton, & Duda, 2017), or because they are younger and tend to perceive more task-involving than ego-involving behaviors in their developmental stage (Vazou, 2010; Vazou et al., 2006).

Peer Influence

A consolidation of the quantitative and qualitative findings reveals that peer-created motivational climates is the second most important protective factor through task-involving climates and the least important risk factors through ego-involving climates that contribute to burnout and dropout intentions in sport. This conclusion is supported by comparing the groups with higher to lower dropout likelihood in the focus group interviews. The higher dropout likelihood group showed the second greatest decline in the number of most positive influence for teammates that was in line with the second most important protective factors, as well as the

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greatest decline in the number of most negative influence for teammates that was in line with the least important risk factors. Peers contributed the most to relatedness satisfaction in girls among the three social agents based on the quantitative brighter side model, which is triangulated by the largest number of most positive influence in girls as teammates. This finding also support the positive associations between adaptive peer relationship profiles and sport motivational outcomes in high school-aged girls (Partridge & Knapp, 2016).

Conversely, peer-created ego-involving climates had the most negative influence on boys through competence and relatedness frustration in the darker side model, which was further shown in the greatest number of negative influence from teammates in the qualitative findings. Therefore, peers are indeed the strongest protective factor for girls and the strongest risk factor for boys in burnout and dropout. On the other hand, whereas the darker side models for varsity and non-varsity athletes were invariant, qualitative findings reveal that peers are the strongest protective factor for varsity athletes and the strongest risk factor for non-varsity athletes based on the most positive and most negative motivational influence from teammates, respectively. The incongruence between quantitative and qualitative findings for team type is reasonable due to the negative experiences of the qualitative participants. When varsity and non-varsity athletes experience burnout symptoms and intend to drop out, they might likely perceive an ego-involving climate from teammates. The emphasis on outperforming others might actually benefit the more skilled varsity athletes to feel more competent and stay in sport, but harm the less skilled non-varsity athletes to feel inadequate and considering quitting sport.

Parental Influence

A consolidation of the quantitative and qualitative data demonstrates that parent-created

motivational climates is the least important protective factor through task-involving climates and the second most important risk factor through ego-involving climates that contribute to burnout and dropout intentions in sport. This conclusion is partially supported by comparing the groups with higher to lower dropout likelihood in the focus group interviews. The higher dropout likelihood group showed the greatest increase in the number of most positive influence for parents that was in line with the least important protective factors, as well as the second greatest decline in the number of most negative influence for parents that was in line with the second most important risk factors. Based on the quantitative brighter side model, parents contributed to competence satisfaction less than coaches and to competence frustration less than peers, but contributing the most to relatedness frustration, which was discussed by several athletes who had overinvolved parents. This minimal parental influence also supports the notion that "although parental influence is a fundamental contributing factor to young athletes' physical and psychosocial development, it gradually changes and diminishes as the athlete grows, matures, and develops" (Jowett & Timson-Katchis, 2005, p. 281).

Parental influence differed in quantitative and qualitative results across groups in a few ways. First, boys had the greatest number of most positive influence from parents based on the focus group interviews, but parent-created task-involving climates were not related to any variables and did not play a role in the brighter side model. One possible reason is that parent-created climates do not directly support psychological needs in boys, but rather through coaches. Specifically, parental support, encouragement, and reinforcement provides a platform for coach-athlete interdependence that fosters a sense of competence and intrinsic motivation (Harter, 1978; Jowett & Timson-Katchis, 2005). Second, parental influence was more prominent among non-varsity athletes and varsity athletes in the qualitative findings, whereas parent-created task-

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involving climates only contributed to competence satisfaction in varsity athletes instead of non-varsity athletes in the quantitative brighter side model. This opposite pattern of parental influence may be due to the high number of overinvolved parents in the varsity athletes who participated in the focus groups. This parental overinvolvement causes pressure that thwart instead of supporting competence in varsity athletes, which can in turn lead to performance anxiety and dropout from sport (Hellstedt, 1987; Lee & MacLean, 1997). Overall, parents were exceptionally supportive of the high school athletes who experienced negative motivational outcomes, yet their influence in reducing maladaptive outcomes might be minimal.

Basic Psychological Needs

Most of the focus group participants, except varsity athletes, expressed greater ratio of need frustration to need satisfaction, which explained their experience of maladaptive outcomes. Surprisingly, not a single participant mentioned autonomy satisfaction, although relatedness satisfaction and autonomy frustration were expressed the most across the interviews. This finding is aligned with the SDT tenet about the central role of autonomy to foster intrinsic motivation (Deci & Ryan, 2000b) and the quantitative finding that relatedness satisfaction mostly only predicted amotivation, but not autonomous motivation. To improve the motivational outcomes of the participants, reducing autonomy frustration and increasing autonomy satisfaction would be helpful. On the other hand, competence satisfaction and frustration contributed the most to autonomous motivation, while relatedness satisfaction contributed the most to amotivation across groups.

Cross-Case Comparisons

In comparing different focus group participants with the quantitative data, a few unique

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cases are identified here that may not fit it the bigger group. The girls in this study who participated in track and field or cross country had mostly positive responses in the focus group interview, although their survey scores for amotivation and burnout were at the highest two quartiles. They mentioned competence frustration in relation to their burnout that stemmed from personal reasons such as perfectionism, exhaustion, and a reduced sense of accomplishment, which were not directly related to the social environments (Gustafssona, Goran, & Hassmen, 2011). They dropout intentions could range from low to high.

Another group of athletes that were different than the bigger group were the ones who fear injury or reinjury. These athletes' burnout symptoms were not the highest, although they had high amotivation and intention to drop out due to a decision to quit sport. Moreover, their parents were usually either undernivolved or moderately involved. While the majority of this group were football players, it also included a softball player who had a concussion in the previous year.

The final group of athletes consisted of four who were no longer competing for the team due to their own choice or nonselection after tryouts. In this situation, burnout and amotivation levels were high, which might be seen as the outcome of not participating in competition anymore. Their intention to drop out was not too high, because they were still able to continue sport participation without any competition.

Limitations and Future Directions

Despite the unique research design and contribution of this study, there are several limitations that need to be addressed. First, this study was cross-sectional in nature, which did not allow interpretation of causal relationships between the variables. Future studies may add multiple time points for both the quantitative and qualitative components of the study to provide

evidence in the relative motivational influence of social agents. Indeed, the member reflections in this study revealed that high school sport participation and motivation was very fluid. A few focus group participants were no longer playing the same sport at the time of member reflections, while some participants mentioned that the social environments created by the coaches and peers had improved due to a variety of reasons such as having a winning season. The complex nature of motivational climates would benefit from a full season of investigation to understand the underlying factors that cause changes in the brighter and darker sides of the athletic experience.

Second, the subsamples of athletes in this study were relatively small and unevenly distributed across gender and team type. The smaller subsample size of girls and varsity athletes might have influenced the multigroup SEM results, in which less significant paths were found in these subgroups. Further, the generalizability of the models might be limited. Future research should try to recruit more girls and varsity athletes for conducting invariance tests to provide a greater power in detecting noninvariance and greater generalizability. A large ratio of football athletes in the boys' sample might have enhanced the relative influence of coaches in this study, because football coaches tend to be highly involved in athlete development inside and outside the sport environment (Gould et al., 2007). Moreover, this study was conducted in a region that valued football more highly than most other sports, and the parental influence might be different if more boys from other sports were recruited. Therefore, more athletes from other sports as well as geographic regions should be recruited in the sample for boys in future studies.

Although the motivational climates created by the three social agents were examined, the social environments studied were still limited to empowering, disempowering, task-involving, and ego-involving climates. As there is evidence regarding the utility of other climates, such as SDT-based structure and involvement, in predicting motivational outcomes (Amorose et al.,

2016), future studies should investigate these climates created by different social agents. Furthermore, only the motivational climates created by the main coach were addressed in this study, and athletes perceived different coaches as their main coach. The interaction of motivational climates created by different coaches should be examined, because the focus group participants alluded to the fact that they had their favorite coaches and were influenced by different coaches both positively and negatively. By specifying the coaches (e.g., head coach, position coach) being investigated for the motivational climate, more comparisons can be made with the consistency in the coach-created climates being compared, such as using multilevel modeling. Additionally, athletes', coaches', and parents' gender and age have been shown to be related to the influence of motivational climates (Amorose et al., 2016; Partridge & Knapp, 2016; Vazou, 2010; Vazou et al., 2006), so future studies may consider these factors in their investigations. Specifically, separating father-created and mother-created motivational climates, as well as those created by a head coach and an assistant coach, or a male coach and a female coach, may provide a more comprehensive understanding of their influence in burnout and dropout.

Additionally, the recruitment of homogenous focus group members could benefit data gathering (Hesse-Biber & Leavy, 2011), whereas it also created issues in this study that participants might know someone better than the others in the same group. When there were friends in a focus group, participants tended to talk more after one another and elaborated on unnecessary information that others may not understand. This conversation pattern might also have led to a potential for the groupthink phenomenon (Janis, 1972)—members of the same focus group tended to agree with one another on certain topics (Morgan, 1997). However, this issue is logistically difficult to avoid due to the number of athletes available at the same time

during a school day. Given a large enough sample and flexibility for participant recruitment, future studies may try to avoid related issues by forming homogenous focus groups of members from different teams or schools who are not friends with each other. Although there are limitations in the research design, numerous data collection and analysis strategies have been used to ensure appropriate validities and reliabilities in the quantitative component and enhance trustworthiness, credibility, transferability, and confirmability in the qualitative part of the study.

Conclusion

High school sport participation produces many physical and psychological benefits, but it may also lead to maladaptive outcomes due to inappropriate sport environments created by coaches, peers, and parents. Yet, SDT researchers often focus on only one of the three significant social agents and study the brighter side of the motivational processes in predicting positive and negative sport participation outcomes. This mixed-methods study provides a unique and comprehensive perspective by studying the interactive social environments created by coaches, peers, and parents and investigating both the brighter side and darker side (i.e., disempowering climates, ego-involving climates, need frustration, amotivation) of the athletic experience. Further, using the methodology of both quantitative survey and focus group interviews provide richness in the data that allows for triangulation and elaboration on the mechanism that lead to burnout and dropout in high school athletes, as well as the differences across gender and team type. In general, coaches have the largest influence in athletes' motivational processes, especially for boys and non-varsity athletes, while peers could be very important protective factors for girls and varsity athletes. Because coaches, peers, and parents all play a role in satisfaction and frustration of basic psychological needs, future intervention studies should address all three

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social agents beyond only coaches to compare the effectiveness of various interventions with

each social agent as well as a combination of them. If intervention strategies for peers and

parents are helpful in improving high school athletes' motivational outcomes over and above

coaching strategies, coach education and parent education programs should include a wider

variety of these strategies that can support athletes' basic psychological needs in order to reduce

their burnout and dropout rates.

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Appendix A

Data Collection Timeline

Data collection timeline	Tasks
Mid-September – Early-November 2017	Recruitment of participants for the study
Late-September – Early-December 2017	Quantitative data collection using two surveys
Mid-October 2017 – Mid-January 2018	Recruitment of participants for the follow-up interviews
Early-November 2017 – Mid-February 2018	Qualitative data collection using focus group interviews and practice observations
Early-March – Mid-April 2018	Individual member reflections

Appendix B: Survey Measures

High School Athlete Survey 1   For Researchers Only: Participant ID [   ]

Instructions: *There are no right or wrong answers. Please select the answers that reflects how you really feel. Your information will be anonymous and kept confidential, so no one at home or school will know.* **Please shade-in Circles like this ⬤ and not like this ⊗.**   ✗

M M   D D   Y Y Y Y

1. Age: [   ] years   2. Date of Birth: [ ] / [ ] / [   ]   3. Sex: ⓪ Female   Male

4. Grade: 9th   10th
             11th   12th
         ⓪ Ungraded / Other

5. Ethnicity: a. Are you Hispanic or Latino?   ⓪ No   Yes
b. What is your race? **(one or more)**   American Indian / Alaska Native   Asian
    Black / African American   Native Hawaiian / Pacific Islander   White

I. Instructions: *As you answer this survey, you will use your **primary sport team** (the one you invest the most time) as a reference.*

1. What is your primary sport? (List ONLY one sport)	
2. What type of team is your primary sport team? (Choose ONLY one type)	
High school freshmen High school JV High school varsity Club Other (Please specify): _____	

II. Instructions: *Please answer the following questions about the environment in your primary sport team and relationships among teammates during the **last 3-4 weeks**.*

On my primary sport team, most athletes…	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1. Help each other improve.							
2. Encourage each other to outplay teammates.							
3. Offer to help their teammates develop new skills.							

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4. Care more about the opinion of the most able teammates.

5. Make their teammates feel valued.

6. Work together to improve the skills they don't do well.

7. Make negative comments that put teammates down.

8. Try to do better than teammates.

9. Criticize teammates when they make mistakes.

10. Teach their teammates new things.

11. Encourage their teammates to try their hardest.

12. Look pleased when they do better than teammates.

13. Make their teammates feel accepted.

14. Want to be with the most able teammates.

15. Praise their teammates who try hard.

16. Complain when the team doesn't win.

17. Are pleased when their teammates try hard.

18. Care about everyone's opinion.

19. Set an example on giving forth maximum effort.

20. Laugh at teammates when they make mistakes.

21. Encourage teammates to keep trying after they make a mistake.

III. Instructions: *This list describes what coaches say or do to athletes on their teams. When giving your answers, think about what your* **main coach** *normally says or does. What kind of atmosphere has your coach generally created during the* **last 3-4 weeks**?

Indicate here the sex of your **main coach**: ⓪ Female   Male

In my primary sport team, my coach...	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Encourages athletes to try new skills.					
2. Is less friendly with athletes if they don't make the effort to see things his or her way.					
3. Gives us choices and options.					
4. Tries to make sure athletes feel good when they try their best.					
5. Substitutes athletes when they make a mistake.					
6. Thinks that it is important for athletes to participate in the sport because the athletes really want to.					
7. Is less supportive of athletes when they are not training and/or playing well.					
8. Can really be counted on to care, no matter what happens.					
9. Gives most attention to the best athletes.					
10. Yells at athletes for messing up.					
11. Makes sure athletes feel successful when they improve.					
12. Pays less attention to athletes if they displease him or her.					
13. Acknowledges athletes who try hard.					
14. Really appreciates athletes as people, not just as athletes.					
15. Only allows something we like to do at the end of training if athletes have done well during the session.					

16. Answers athletes' questions fully and carefully.
17. Is less accepting of athletes if they have disappointed him/her.
18. Makes sure that each athlete contributes in some important way.
19. Has his or her favorite athletes.
20. Only rewards athletes with prizes or treats if they have done well.
21. Only praises athletes who perform the best during a match/race.
22. Tries to explain why it would be good to do so when he/she asks athletes to do something.
23. Makes sure everyone has an important role on the team.
24. Shouts at athletes in front of others to make them do certain things.
25. Thinks that only the best athletes should compete in a match/race.
26. Threats to punish athletes to keep them in line during training.
27. Listens openly and does not judge athletes' personal feelings.
28. Lets us know that all the athletes are part of the team's success.
29. Mainly uses rewards or praise to make athletes complete all the tasks he/she sets during training.
30. Encourages athletes to help each other learn.
31. Tries to interfere in aspect of athletes' lives outside of the sport.
32. Thinks that it is important for athletes to participate in the sport because the athletes enjoy it.
33. Favors some athletes more than others.
34. Encourages athletes to really work together as a team.

IV. Instructions: *Please read each statement and indicate which response best reflects how you feel regarding* **one of your parents** *(mother/father/stepmother/stepfather) in participating your primary sport during the* **last 3-4 weeks**.

Indicate here the parent (**most involved** in your sport participation) you refer to for the following responses: _____

I feel that my parent…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Is most satisfied when I learn something new.					
2. Makes me worried about failing.					
3. Looks satisfied when I win without effort.					
4. Makes me worried about failing because it will appear negative in his/her eyes.					
5. Pays special attention to whether I am improving my skills					
6. Believes that it is important for me to win without trying hard.					
7. Makes sure I learn one thing before teaching me another.					
8. Thinks I should achieve a lot without much effort.					
9. Believes enjoyment is very important in developing new skills.					
10. Makes me feel badly when I can't do as well as others.					
11. Looks completely satisfied when I improve after hard effort.					
12. Makes me afraid to make mistakes.					
13. Thinks I should be satisfied when I achieve without trying hard.					
14. Approves of me enjoying myself when trying to learn new skills.					
15. Supports my feeling of enjoyment to skill development.					

| 16. Makes me worried about performing skills that I am not good at. |
| 17. Encourages me to enjoy learning new skills. |
| 18. Believes that making mistakes is part of learning. |

V. Instructions: *The following questions relate to your personal information and family background.*

| 1. Height | ☐ feet ☐ inches | 2. Weight | ☐☐ pounds | 3. Number of sisters ☐ | 4. Number of brothers ☐ |

5. Which of the following best describes your parental makeup?

Two biological parents   Single parent mother   Single parent father

Stepparent family with biological mother   Stepparent family with biological father   Other (Please specify) _____

6. Do/Did your parents and/or siblings play sports competitively?

	No	Yes, the same sport as mine	Yes, but a different sport than mine	Does not apply
Mother	Ⓞ			
Father	Ⓞ			
Sister(s)	Ⓞ			
Brother(s)	Ⓞ			

7. During the past 12 month, how would you describe your grades in school?

Mostly A's   Mostly B's   Mostly C's   Mostly D's   Mostly F's   Other (Please specify) _____

High School Athlete Survey 2

For Researchers Only: Participant ID [ ]

Instructions: *There are no right or wrong answers. Please select the answers that reflects how you really feel. Your information will be anonymous and kept confidential, so no one at home or school will know.* ***Please shade-in Circles like this*** ● *and not like this* ☐.   ✕

		M M	D D	Y Y Y Y		
1. Age: ☐☐ years	2. Date of Birth:	☐☐ /	☐☐ /	☐☐☐☐	3. Sex:	Ⓞ Female Male

4. Grade:	9th 10th
	11th 12th
	Ⓞ Ungraded / Other

| 5. Race / Ethnicity: | **a.** Are you Hispanic or Latino?   Ⓞ No   Yes |
| **b.** What is your race? **(one or more)**   American Indian / Alaska Native   Asian |
| Black / African American   Native Hawaiian / Pacific Islander   White |

I. Instructions: *As you answer this survey, you will use your **primary sport team** (the one you invest the most time) as a reference.*

| 1. What is your primary sport? (List ONLY one sport) | |

2. What type of team is your primary sport team? (Choose ONLY one type)

High school freshmen   High school JV   High school varsity   Club   Other (Please specify): _____

II. Instructions: *Mark the response that best reflects how you feel about participating in your primary sport team.*

| | Strongly Disagree | Neutral | Strongly Agree |

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1.   I have a say in what I do when participating in my sport.
2.   I think I am pretty good at my sport.
3.   In my team, I feel supported.
4.   I feel forced to do things in my sport, even when I don't really want to do them.
5.   I am satisfied with my performance in my sport.
6.   In my team, I feel understood.
7.   I help decide what I do when participating in my sport.
8.   After participating in my sport for a while, I feel pretty competent.
9.   In my team, I feel listened to.
10.   I get to do the things I want to do when participating in my sport.
11.   I am pretty skilled at my sport.
12.   In my team, I feel valued.
13.   I do not have a say in what I do when participating in my sport.
14.   I couldn't play my sport very well.
15.   In my team, I feel safe.
16.   I do not get to make decisions about what I do when I am participating in my sport.

III. Instructions: *Mark the response that best reflects how you feel about participating in your primary sport team.*

	Strongly Disagree	Neutral	Strongly Agree
1. I feel prevented from making choices with regard to the way I train.			
2. There are situations where I am made to feel inadequate.			
3. I feel pushed to behave in certain ways.			
4. I feel I am rejected by those around me.			
5. I feel forced to follow training decisions made for me.			
6. I feel inadequate because I am not given opportunities to fulfill my potential.			
7. I feel under pressure to agree with the training regimen I am provided.			
8. I feel others can be dismissive of me.			
9. Situations occur in which I am made to feel incapable.			
10. I feel other people dislike me.			
11. There are times when I am told things that make me feel incompetent.			
12. I feel other people are envious when I achieve success.			

IV. Instructions: *Please indicate in each statement which response best reflects how often you feel that way in your primary sport.*

	Almost Never	Rarely	Sometimes	Frequently	Almost Always
1. I am accomplishing many worthwhile things in my sport.					
2. I feel so tired from my training that I have trouble finding energy to do other things.					
3. The effort I spend in my sport would be better spent doing other things.					
4. I feel overly tired from my sport participation.					
5. I am not achieving much in my sport.					
6. I don't care as much about my sport performance as I used to.					
7. I am not performing up to my ability in my sport.					
8. I feel "wiped out" from my sport.					
9. I'm not into my sport like I used to be.					
10. I feel physically worn out from my sport.					
11. I feel less concerned about being successful in my sport than I used to.					
12. I am exhausted by the mental and physical demands of my sport.					
13. It seems that no matter what I do, I don't perform as well as I should.					
14. I feel successful at my sport.					
15. I have negative feelings toward my sport.					

V. Instructions: *Please indicate to what extent each of the following reasons represent why you participate in your primary sport.*

I participate in my primary sport…	Not at All True	Somewhat True	Very True
1. Because I enjoy it.			
2. Because it's a part of who I am.			
3. Because it's an opportunity to just be who I am.			
4. Because I would feel ashamed if I quit.			
5. But the reasons why are not clear to me anymore.			
6. Because I would feel like a failure if I quit.			
7. But I wonder what the point is.			
8. Because what I do in sport is an expression of who I am.			
9. Because the benefits of sport are important to me.			
10. Because if I don't other people will not be pleased with me.			
11. Because I like it.			
12. Because I feel obligated to continue.			
13. But I question why I continue.			
14. Because I feel pressure from other people to play.			
15. Because people push me to play.			
16. Because it's fun.			
17. Because it teaches me self-discipline.			
18. Because I would feel guilty if I quit.			
19. Because I find it pleasurable.			
20. Because I value the benefits of my sport.			

21. But I question why I am putting myself through this.	
22. Because it is a good way to learn things which could be useful to me in my life.	
23. To satisfy people who want me to play.	
24. Because it allows me to live in a way that is true to my values.	

VI. Instructions: *Please respond to each statement the degree to which it is true in your primary sport and in general in your life.*

When participating in my primary sport…	Not at All True	Somewhat True	Very True
1. I feel alive and vital.			
2. Sometimes I feel so alive I just want to burst.			
3. I have energy and spirit.			
4. I nearly always feel alert and awake.			
5. I feel energized.			
In general in my life…	Not at All True	Somewhat True	Very True
6. I feel alive and vital.			
7. Sometimes I feel so alive I just want to burst.			
8. I have energy and spirit.			
9. I nearly always feel alert and awake.			
10. I feel energized.			

VII. Instructions: *Please mark the response that best reflects how you feel about participating in your primary sport.*

	Strongly Disagree	Neutral	Strongly Agree
1. I am determined to participate in my sport the next season.			
2. I intend to participate in my sport the next season.			
3. I plan to participate in my sport the next season.			
4. I am thinking of quitting my sport.			
5. I intend to drop out of my sport at the end of this season.			
6. I intend to drop out of all sports at the end of this season.			
7. If you intend to drop out of your sport, what is the main reason? **(Write 3-5 words)**			

VIII. Instructions: *The following questions relate to your sport participation background.*

1. How many **years** have you trained for your primary sport? ☐☐	2. On how many teams do you play your primary sport? ☐
3. How many **hours per week** do you train for and compete in your primary sport: **a. in school** ☐☐ **b. outside of school** ☐☐	
4. What is the highest level of competition you have reached in your primary sport? School District Regional State National International Other (Please specify): _____	
5. What period of the season is your primary sport team in now?	

Pre-season	Beginning of the season	Middle of the season	End of the season	Off-season		
			No	Yes		I don't know
6. Are you a starter on your team?			Ⓞ			
7. Are you the captain on your team?			Ⓞ			
8. Do you plan on playing collegiate athletics?			Ⓞ			
9. How many competitive sports: a. have you ever played ☐ b. do you currently play ☐						

Introduction

Good morning/afternoon! My name is Alan Chu. I am a doctoral candidate at the University of North Texas, currently conducting my dissertation research project on sport motivation in high school athletes. Thank you for completing the previous surveys and participating in this follow-up interview. This interview will take about 45 minutes and include a few questions about your sport experiences and interactions with coaches, teammates, and parents as a high school student athlete. All of your responses are confidential, meaning none of your coaches, teachers, and parents will have access to this information. There are no right or wrong answers to the questions, so I hope you can honestly and openly express your feeling and opinions in this interview. Your interview responses will be analyzed for me to develop a better understanding of what influences your motivation and participation in high school athletics.

At this time, I would like to remind you of your written consent to participate in the study, verifying that you agree to engage in this interview. I would like to record this interview, so I can accurately document the information you provide. May I have your permission for that? Your participation is completely voluntary, and you may withdraw at any time without any consequence on your grades or sport participation. Do you have any questions or concerns?

Before we start, there are a few rules I would like to mention about the interview. First, please turn off your cell phone if you have it with you. Second, my role is a facilitator, so you may feel free to discuss the question with your group members like a conversation instead of only speaking to me. Third, you don't need to agree with others, but please listen respectfully as others share their views and try not to interrupt them until they finish speaking. Is that clear? We will now begin the interview.

I. Self-Introduction of Focus Group Members

Please tell everyone your name, what sports you play at school, your primary sport, and how long you have played your primary sport.

II. High School Sport Experiences

Tell me some of the most positive experiences playing your sport in high school.

Tell me some of the most negative experiences playing your sport in high school.

III. Roles of Coaches

How do your coach(es) affect your motivation to play sport?

Positive and negative aspects

IV. Roles of Peers (Teammates)

How do your teammates affect your motivation to play sport?

Positive and negative aspects

V. Roles of Parents

How do your parents (both father and mother) affect your motivation to play sport?

Positive and negative aspects

VI. Relative Influence of Social Agents

Think about your coach(es), teammates, and parents. Who may have more positive influence and who may have more negative influence toward your motivation?

Closing

Do you have questions or add anything that we have not touched on in the interview? Thank you so much for your time and participation today! Please feel free to contact me if you have any questions or concerns about the interview later. I will contact you for a short conversation to make sure your responses are interpreted accurately.

Appendix D: Focus Group Evaluation Form

Name: _____   Date: _____

Your feedback will help us to understand how the focus group went. Please be honest.

Please check the appropriate box.	No	Neutral	Yes
The focus group was better than I expected			
I enjoyed discussing this topic with my classmates			
We were given enough time for discussion			
The facilitator encouraged participation			
I got a chance to say what I wanted to say			
If not, why? _____			
I was honest in during the focus group discussions			
If not, why? _____			

Any other comments? (e.g. what you liked or didn't like; how the group could be improved)

_____

_____

_____

Thank you for your participation!

Appendix E: High School Athletes Focus Group Interview Codebook

Nodes, Descriptions, and Frequencies

Name	Description	Sources	References
Basic Psychological Needs		**8**	**103**
Psychological Need Frustration	*The feelings that arise when athletes perceive their psychological needs to be actively thwarted and undermined by others in sport*	*8*	*62*
Autonomy Frustration	Athletes feel controlled and pressured for their behavior.	7	22
Competence Frustration	The athlete feels ineffective in his or her ongoing interactions and is restricted to express his or her capabilities in sport.	8	22
Relatedness Frustration	The athlete feels an insecure sense of belongingness and experience disapproval by others in sport.	6	18
Psychological Need Satisfaction	*The feelings that arise when athletes perceive their psychological needs to be actively supported by others in sport*	*7*	*41*
Autonomy Satisfaction	Athletes feel volitional and responsible for their own behavior.	0	0
Competence Satisfaction	The athlete feels effective in his or her ongoing interactions and experience opportunities to express his or her capabilities in sport.	6	11
Relatedness Satisfaction	The athlete feels a secure sense of belongingness and connectedness to others in sport.	6	30
Coach-Created Motivational Climates		**8**	**153**
Disempowering Motivational Climate	*A psychological environment marked by features that serve to thwart athletes' basic psychological needs for autonomy and belongingness and encourage an other-focused conception of competence.*	*8*	*100*

Name	Description	Sources	References
Controlling	The environment created by the coach thwarts athletes' feelings of control by coercing and pressurizing them to behave in a specific way.	8	69
Devalues Athletes' Perspective	The coach ignores or downplays the importance of athletes' views, thoughts, and feelings.	8	34
Exerts Overt (Physical, Personal) Control	The coach makes an overt attempt to influence the behavior of his or her athletes, or interfere in other aspects of their lives.	6	10
Intimidate (to frighten by threats) Athletes	The coach uses power-assertive strategies to frighten athletes into behaving in a certain way.	5	13
Provides Negative Conditional Regard	The coach responds harshly when athletes don't meet their expectations. The coach withdraws their attention or show disappointment when an athlete performs poorly or makes mistakes.	3	5
Uses Controlling Language	The coach uses coercive language to encourage players to follow their requests.	5	7
Uses Rewards for Control	The coach offers players rewards upon the successful completion of requests.	0	0
Ego-Involving	An ego-involving climate prevails when the coach focuses on other-referenced criteria for success. In an ego-involving climate, the coach focuses on athletes outperforming one another and demonstrating high normative standards.	6	31
Encourages Inter- or Intra-team Rivalry	The coach fosters a sense of rivalry by emphasizing to athletes the importance of outperforming their peers or the opposing team.	4	6
Recognizes Superior and Inferior Ability	The coach acknowledges and draws attention to those athletes who have high or low ability and skill levels.	5	21

Name	Description	Sources	References
Uses Punishment for Mistakes	The coach makes the athletes perform a punishment if they do not perform a task correctly or meet recognized normative standards,	2	4
Empowering Motivational Climate	*A psychological environment marked by features that support athletes' basic psychological needs for autonomy and belongingness and encourages a task-focused conception of competence.*	7	53
Autonomy Support	An autonomy-supportive environment prevails when a coach attempts to identify and nurture his or her athletes' needs, interests, and preferences while encouraging them to take control over their own participation.	5	9
Acknowledges Feelings and Perspective	The coach has considered athletes' views, thoughts, and feelings	3	3
Emphasizes Intrinsic Task Interest	The coach emphasizes to athletes the intrinsic reasons (i.e. fun and enjoyment) for taking part in the sport	2	2
Encourages Initiative Taking	The coach encourages athletes to problem-solve by taking the initiative and experimenting with their own ideas.	1	1
Provides Meaningful Choices	The coach provides athletes with options to choose from. For it to be meaningful, athletes have to be able to engage in the decision-making process in which the choices are viable.	1	1
Provides Opportunities for Input	The coach encourages his or her athletes to make suggestions and share their opinions in the sport.	0	0
Provides Rationale for Tasks, Requests, and Constraints	The coach explains or gives a reason for why he or she has requested a particular course of action.	2	2
Relatedness Support	Relatedness supportive and personally close social environments encourage feelings of care, acceptance, inclusion, trust, and respect. This is communicated in a warm, positive, consistent, and non-contingent manner.	7	31

Name	Description	Sources	References
Adopts a Positive (Warm and Constructive) Communication Style	During interactions with his or her athletes, the coach adopts a warm, close, and positive interpersonal style, tending to focus on the good aspects of training or competition.	5	6
Engages in Non-Instructional Conversation with Athletes	The coach makes an attempt to find out about and take an interest in his or her athletes' lives.	4	11
Makes an Active Attempt to Include All Athletes	The coach is aware of and makes sure all of the athletes are involved in training and competition.	4	8
Provides Unconditional Regard	The coach shows respect for and responds positively to his or her players following both successful and unsuccessful performances.	4	6
Task-Involving	A task-involving climate prevails when the coach focuses on self-referenced criteria for success. In a task-involving climate, the coach emphasises the importance of self-improvement, demonstrating task-mastery, and exerting effort to achieve success.	6	13
Emphasizes Task-focused Competence Feedback	The coach provides feedback to athletes in relation to how they can improve and develop their own skills.	4	7
Explains Player Role Importance	The coach acknowledges the important contribution of all athletes on the team and explains why he or she has asked athletes to take on specific roles.	1	1
Recognizes Effort and Improvement	The coach acknowledges the importance of athletes trying hard, getting better, and learning new skills regardless of their successful and unsuccessful performance.	3	4
Uses Cooperative Learning	The coach encourages players to work together to learn together.	1	1
Family Sport Pressure	**Perceived pressure to perform well in sport due to family members' sport achievement**	**5**	**8**
Brother		2	2

Name	Description	Sources	References
Father		5	5
Mother		0	0
Sister		0	0
Motivation in Sport		**7**	**19**
Amotivation	Athletes lack a sense of intention to participate, question whether they should continue sport, and feel as though they are "going through the motion." Amotivation refers to a lack of motivation.	5	6
Autonomous Extrinsic Motivation		*3*	*6*
Identified Regulation	The athlete participates in sport because he or she values and judges the separable outcomes of sport as being personally important.	1	1
Integrated Regulation	The athlete participates in sport because he or she views sport not only as important but also in congruence with deeply held values and sense of self, Integrated regulation is the most autonomous (i.e., self-determined) form of extrinsic motivation.	3	5
Controlled Extrinsic Motivation		*2*	*2*
External Regulation	The athlete participates in sport to obtain rewards, avoid punishment, or satisfy an external demand. External regulation is the least self-determined form of extrinsic motivation.	2	2
Introjected Regulation	The athlete participates in sport to avoid feelings such as guilt or shame, or to enhance ego and feelings of self-worth.	0	0
Intrinsic Motivation	The athlete participates in sport because of interest or enjoyment in the activity itself.	3	5
Motivational Outcomes		**7**	**25**

Name	Description	Sources	References
Negative, Non-Sport Domain	Negative outcomes in other domains such as academics and mental health issues	0	0
Negative, Sport Domain		*5*	*16*
Athlete Burnout	A psychological syndrome of emotional/physical exhaustion, reduced sense of accomplishment, and sport devaluation.	4	9
Exhaustion	The athlete experiences emotional and/or physical exhaustion associated with the intense demands of training and competing.	3	5
Reduced Accomplishment	The athlete feels a reduced sense of accomplishment in terms of their sport skills and abilities.	1	1
Sport Devaluation	The athlete expresses a loss of interest, lack of desire, and lack of caring about sport and his or her own performance.	3	3
Dropout from Sport		4	7
Determined to Drop Out	The athlete has already decided to drop out without hesitation.	1	2
Intended to Drop Out	The athlete has thoughts of dropping out but not a plan yet	4	4
Planned to Drop Out	The athlete has some plans of dropping out but not a firm decision	1	1
Other Negative Outcomes		0	0
Positive, Non-Sport Domain	Positive outcomes in other domains such as academics and life skills	2	4
Positive, Sport Domain		4	5
Parental Concern Over Injury		**4**	**7**
Both		0	0
Father		3	3
Mother		3	4

Name	Description	Sources	References
Parental Involvement	**The amount of involvement that parents have in the athletic activities of their children falls on a continuum from underinvolved, to moderate, to overinvolved.**	**8**	**33**
Moderate Involvement	The parent has firm parental direction, but with enough flexibility so that the young athlete is allowed significant involvement in decision-making. Parent is supportive, but ultimate decisions about participation and levels of achievement are made by the athlete. Parent is interested in feedback from the coach about their children's skill development and support their children's participation financially without being excessive.	7	14
Both		5	7
Father		2	3
Mother		3	3
Overinvolvement	The parent has an excessive amount of involvement in the athletic success of their children, a need that is satisfied through their children's participation, or a hidden agenda of hoping the children's success will provide later opportunities in education or career. Parent is not able to separate own wishes, fantasies, and needs from those of their children, characterized by excessive attendance at practice sessions, standing next to the coach, yelling, frequent disagreements with game or race officials.	5	9
Both		1	1
Father		3	6
Mother		2	2
Underinvolvement	A relative lack of emotional, financial, or functional investment on the part of parents, such as lack of attendance at games or events, a minimal financial investment in equipment, little assistance with transportation, minimal interest in interactions	6	10

Name	Description	Sources	References
	with the coach in regard to their son's or daughter's participation or skill development, and little or no assistance in helping the athlete set realistic outcome and performance goals.		
Both		2	2
Father		3	3
Mother		3	5
Parent-Created Motivational Climates		**8**	**79**
Negative Motivational Climate		*7*	*31*
Controlling	Parents use directive behavior to control the athlete's behavior	7	25
Both	Both father and mother	4	8
Father		4	13
Mother		4	4
Ego-Involving	An ego-involving climate involves an emphasis on winning, punishing mistakes, and encouraging normative comparison.	4	6
Success Without Effort	Parents' emphasis on achieving without trying and their satisfaction with the athlete not putting forth effort.	0	0
Both	Both father and mother	0	0
Father		0	0
Mother		0	0
Worry-Conducive	Parents emphasize concerns about failure, mistakes, and the athlete not performing as well as others.	4	6
Both	Both father and mother	1	1
Father		2	3

Name	Description	Sources	References
Mother		2	2
Positive Motivational Climate		*8*	*48*
Autonomy Support	Parents engage in behaviors that acknowledge the athlete's thoughts and feelings, encourage choice and self-regulation, and minimize the use of pressure and demands to control them.	7	11
Both	Both father and mother	6	7
Father		2	2
Mother		2	2
Relatedness Support	Parents are actively involved in the athlete's sport participation, use praise, and display understanding.	6	29
Both	Both father and mother	6	15
Father		2	6
Mother		5	8
Task-Involving	A task-Involving climate involves a focus on learning from mistakes, enjoyment, and self-referenced success criteria.	5	8
Learning-Oriented	Parents emphasize enjoyment, effort, learning new skills, and making mistakes as a part of learning.	5	8
Both	Both father and mother	2	3
Father		3	4
Mother		1	1
Peer-Created Motivational Climates		**8**	**93**
Negative Motivational Climate		*7*	*52*

Name	Description	Sources	References
Controlling	A controlling climate refers to athletes' feeling that their teammates act in a controlling manner, which restrict their input in decision-making and freedom in the way they play.	2	3
Ego-Involving	An ego-involving motivational climate emphasizes interpersonal comparison, the demonstration of normative ability, and competition with teammates.	7	49
Intra-Team Competition or Ability Comparison	Intra-team competition is defined as the promotion of inter-individual competition by the peer group.	4	10
Intra-Team Conflict	Intra-team conflict refers to negative and unsupportive behaviors (e.g., criticizing teammates when they make mistakes).	7	29
Normative ability	Normative ability measures peer preference for the most competent players.	2	10
Positive Motivational Climate		*8*	*41*
Autonomy Support	Autonomy support refers to athletes' feeling that their teammates allow them to have input in decision-making and freedom in the way they play.	0	0
Relatedness Support	Relatedness support is defined as fostering the feeling of being part of a group as well as the creation of a friendly atmosphere in the team.	7	20
Task-Involving	In a task-involving motivational climate, athletes derive satisfaction from personal progress, perceive that significant others emphasize personal skill improvement, and regard errors as part of learning.	7	21
Cooperation	Cooperation refers to working together in order to learn new skills.	2	3
Effort	Effort measures the degree to which athletes emphasize to their teammates that they should try their hardest.	4	6

Name	Description	Sources	References
Equal treatment	Equal treatment refers to the extent to which everyone has an important role in the team.	2	3
Improvement	Improvement dimension is defined as encouraging and providing feedback to teammates to improve.	6	9
Relative Motivational Influence	**Relative influence of the three social agents (i.e., coaches, parents, teammates) in the motivational processes of sport participation**	**8**	**70**
Most Negative Influence		*8*	*35*
Both Coaches and Parents		0	0
Both Coaches and Teammates		1	2
Both Teammates and Parents		0	0
Coaches		4	10
No Negative Influence		4	6
Other Influence Beyond Social Agents		2	3
Parents		1	1
Teammates		5	13
Most Positive Influence		*8*	*35*
Both Coaches and Parents		1	2
Both Coaches and Teammates		2	2
Both Teammates and Parents		1	1
Coaches		3	7
Other Influence Beyond Social Agents		2	2

Name	Description	Sources	References
Parents		4	10
Teammates		4	11

Appendix F: Diagrams for the Confirmatory Factor Analysis Models

Empowering and Disempowering Motivational Climate Questionnaire
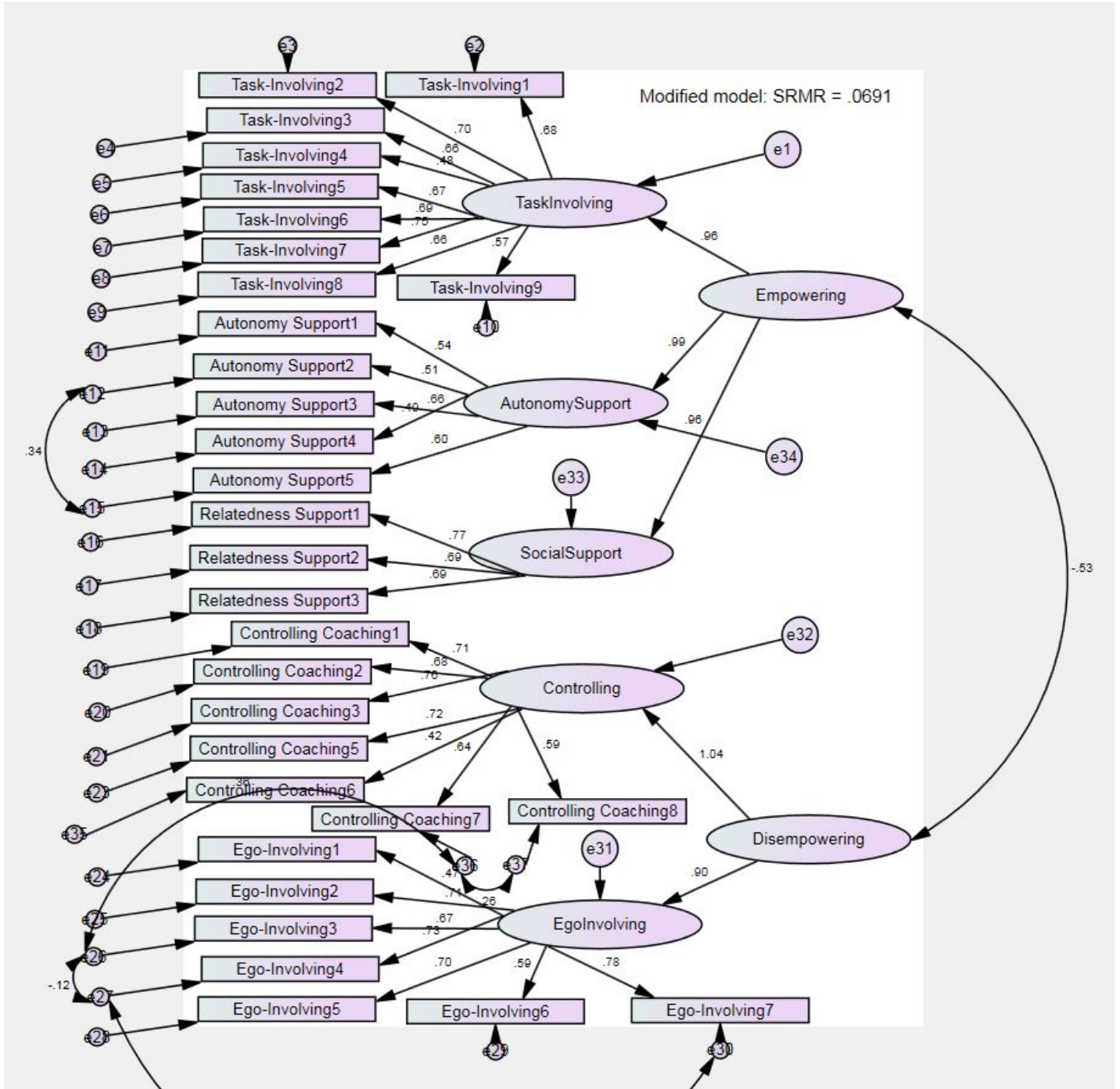
Peer Motivational Climate in Youth Sport Questionnaire with Original Factor Structure
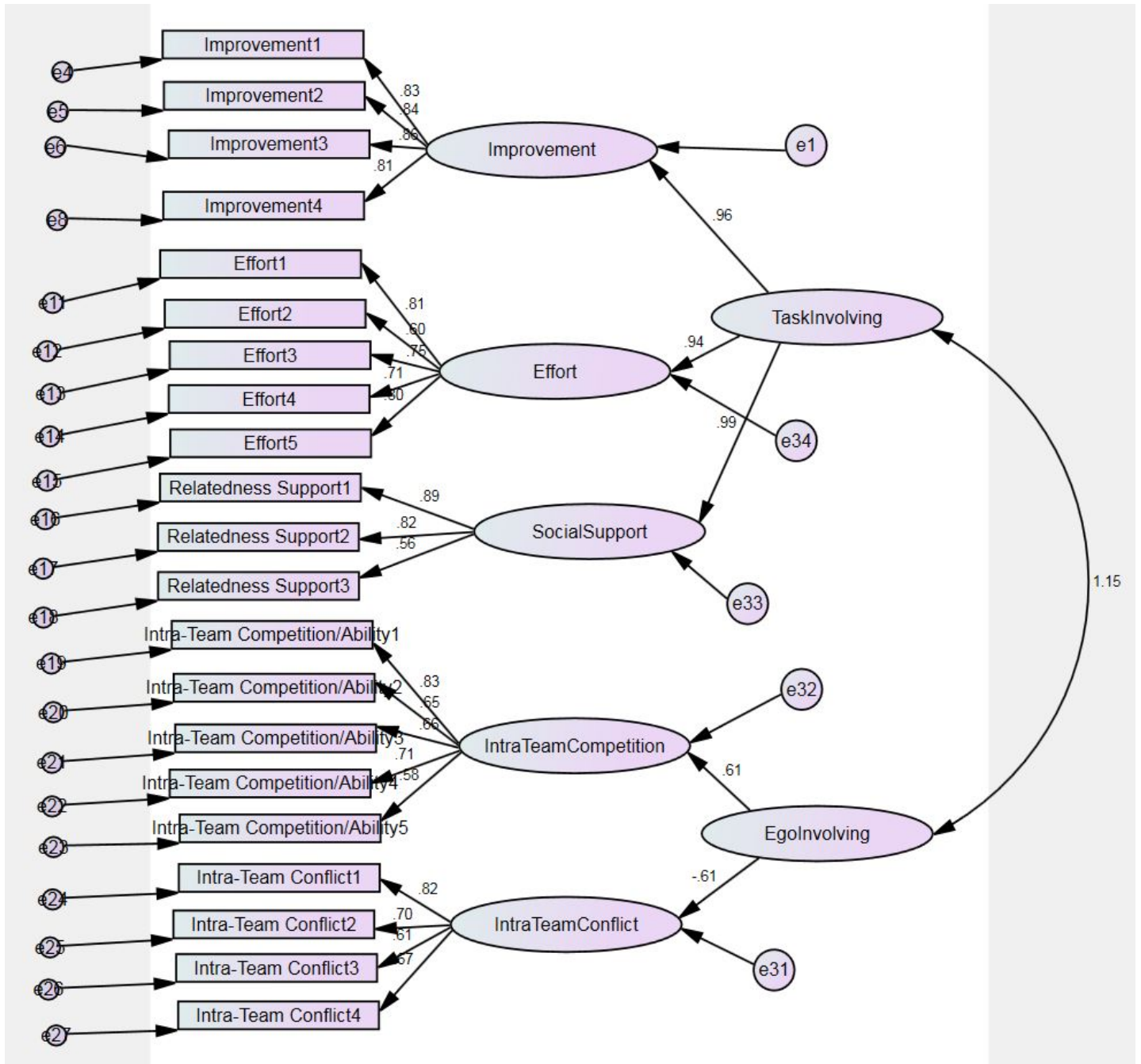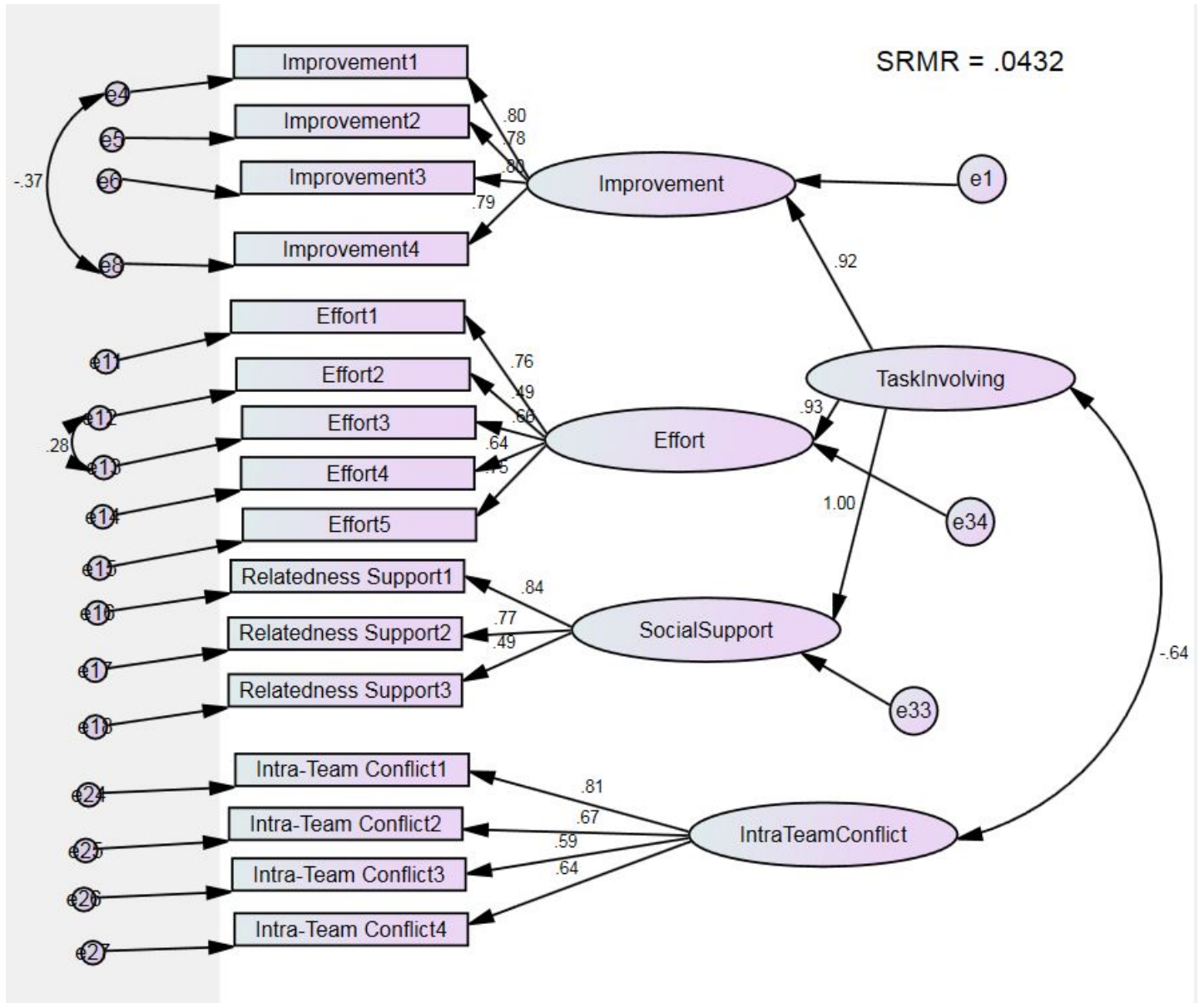
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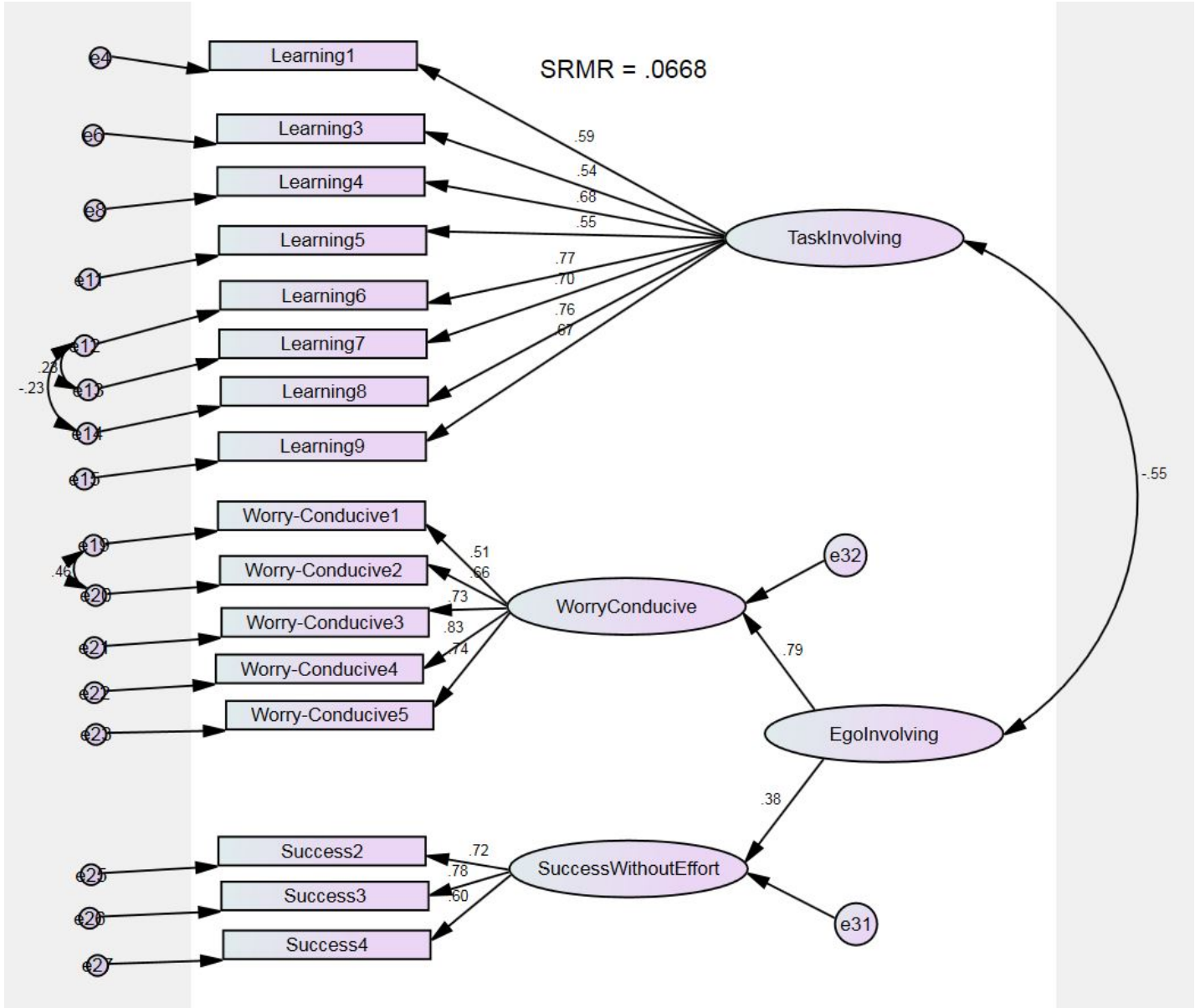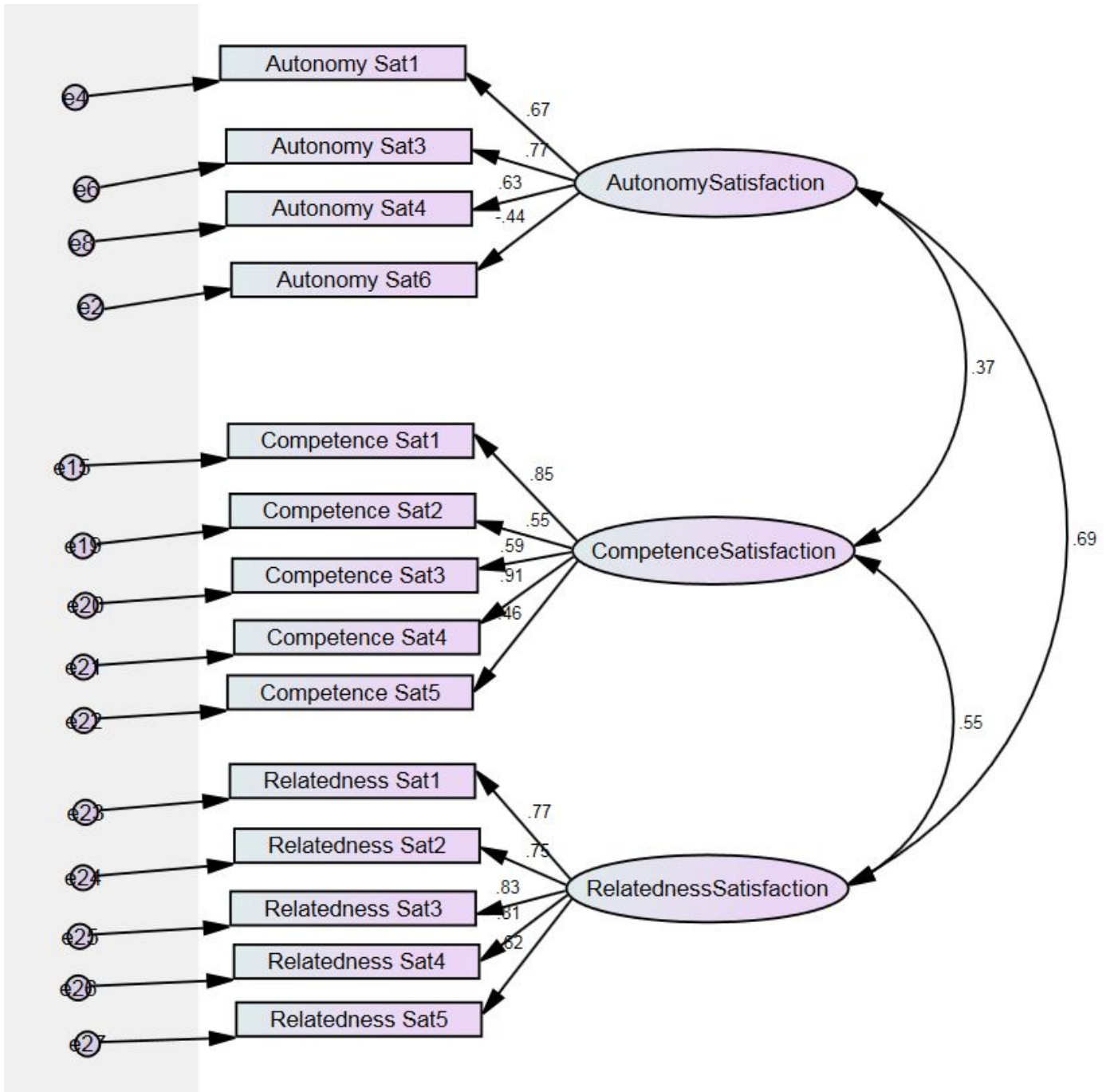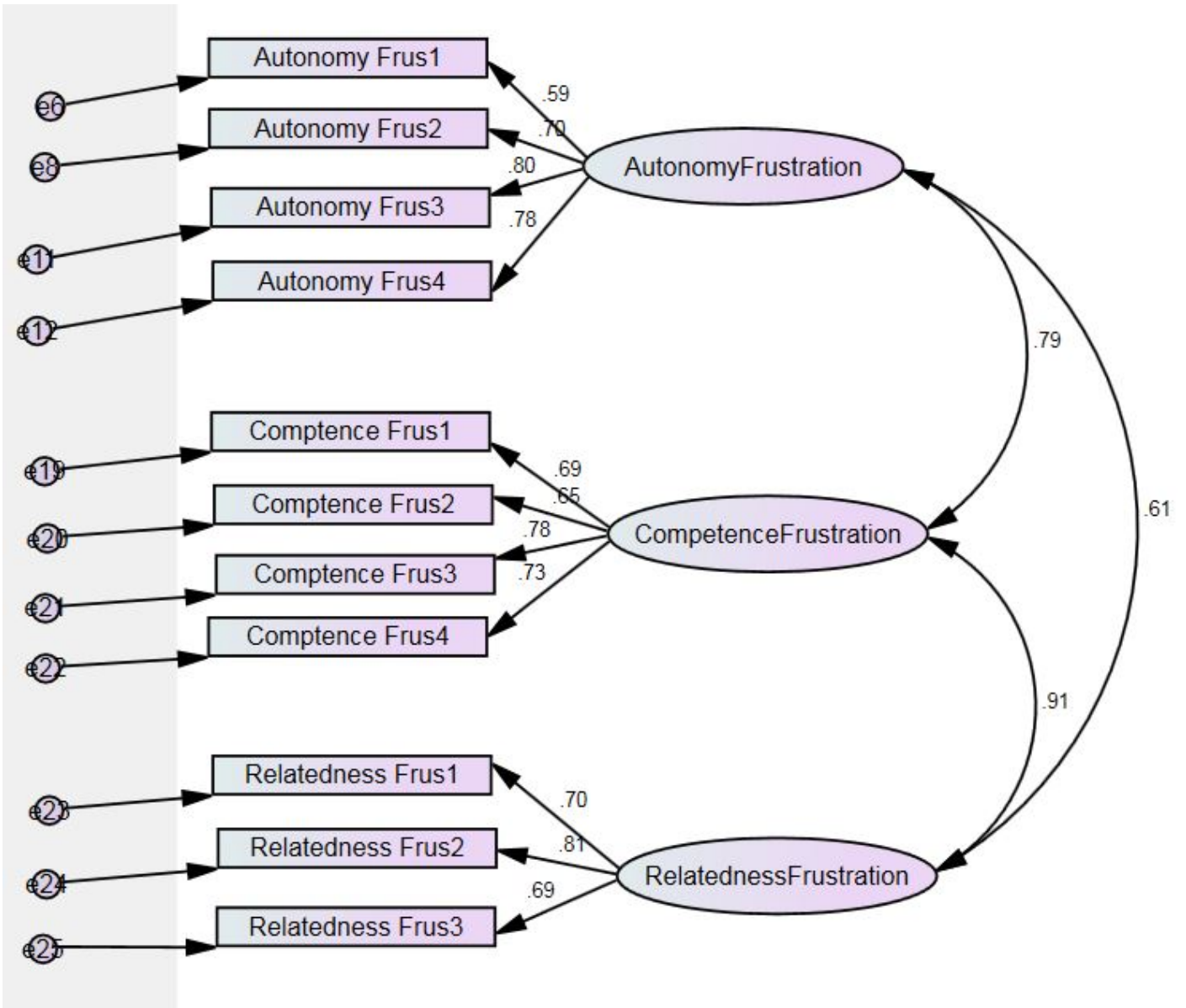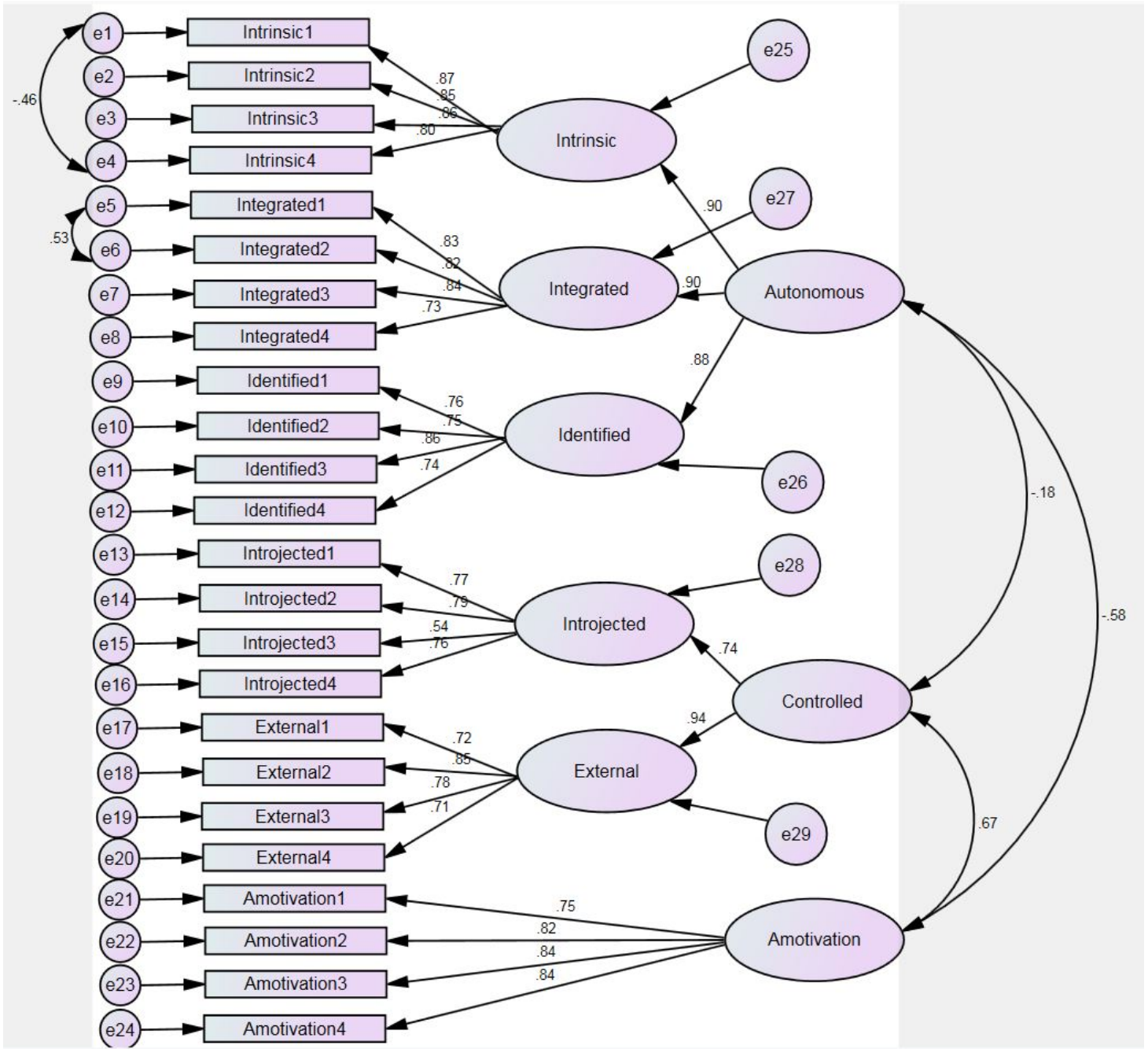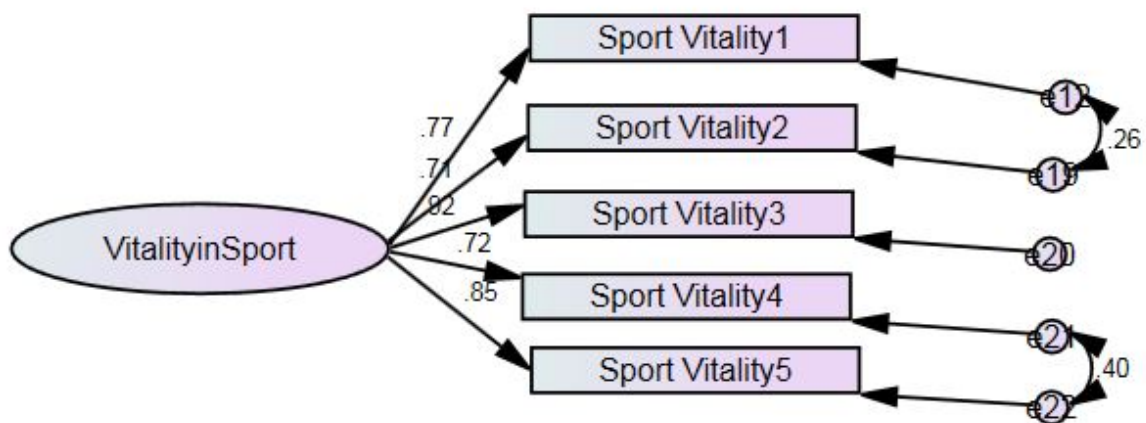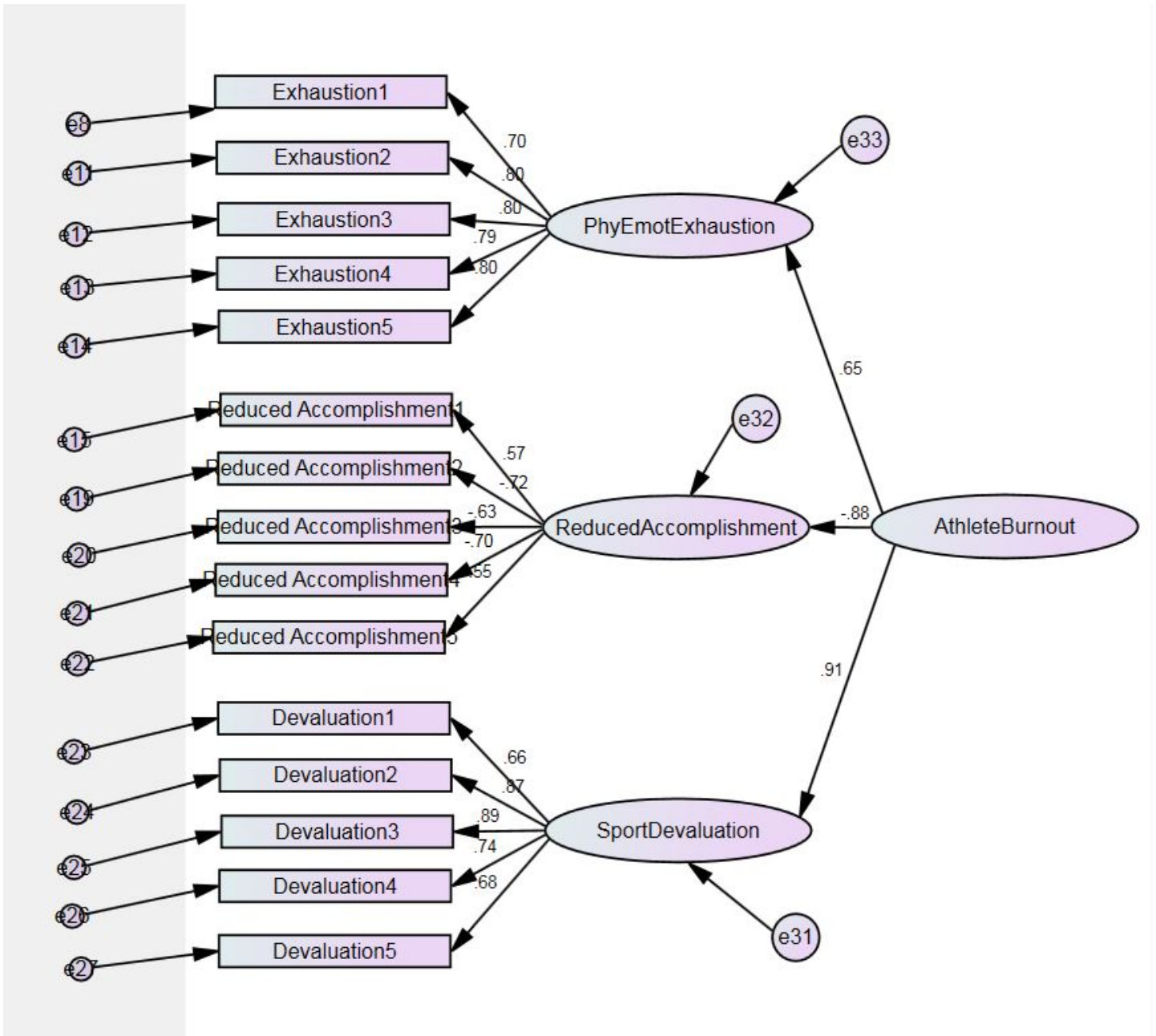
Intention to Drop Out

Item-Level Model 1
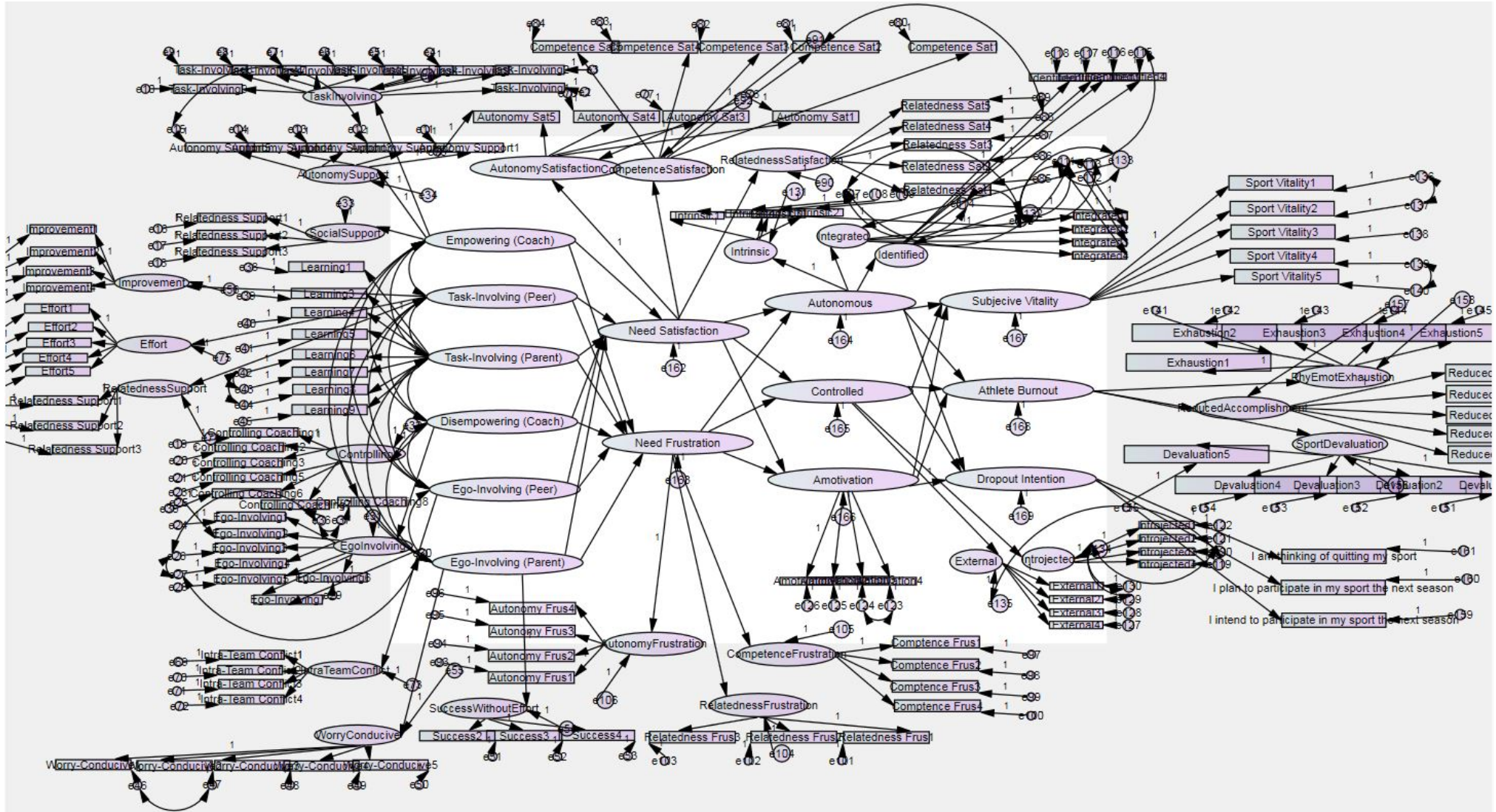
Appendix H: Diagrams for the Parcel-Level SEM Models

Parcel-Level Model 4
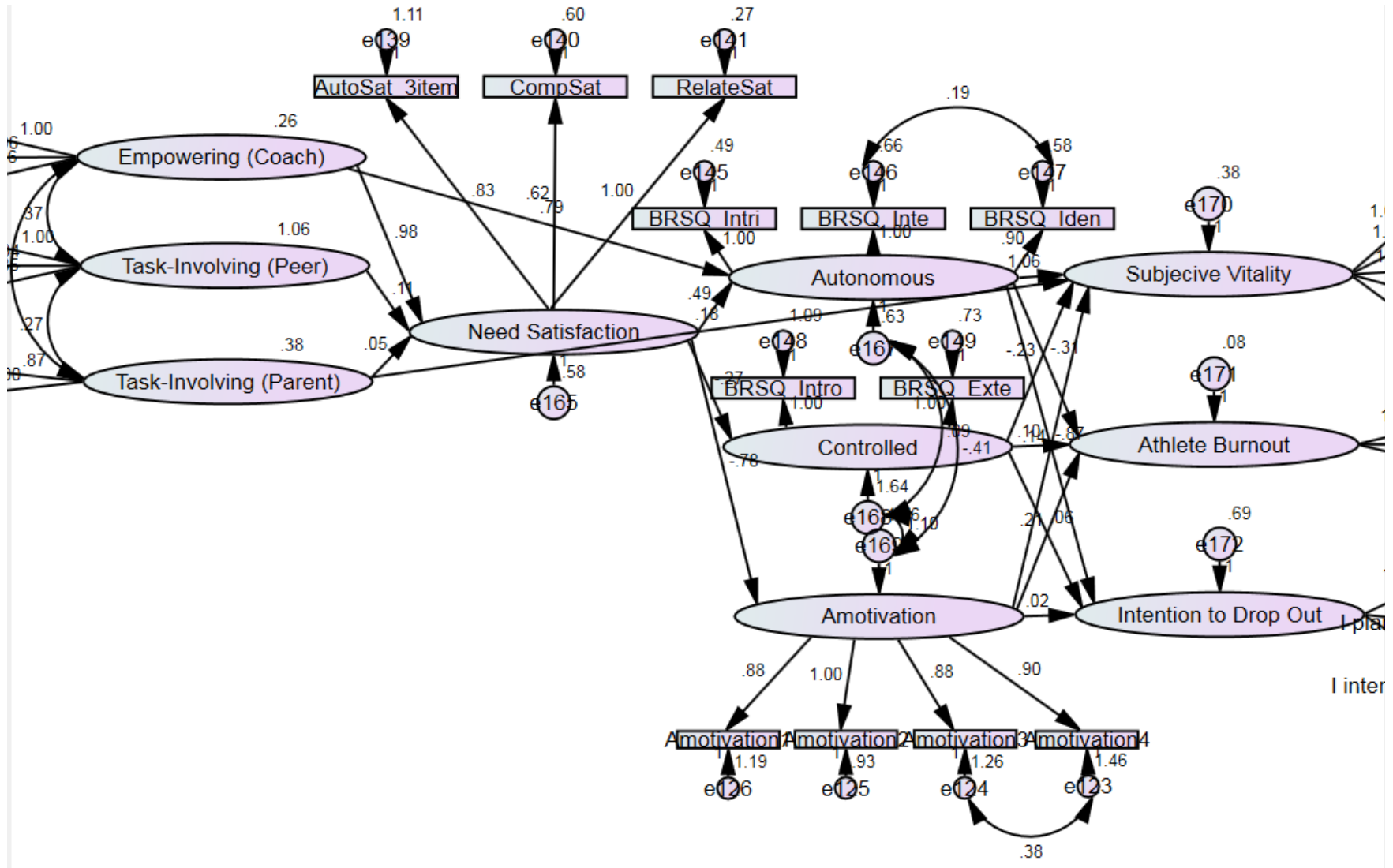
Parcel-Level Model 5 (Final "Brighter Side" Model)

Parcel-Level Model 6

Parcel-Level Model 7 (Final "Darker Side" Model)
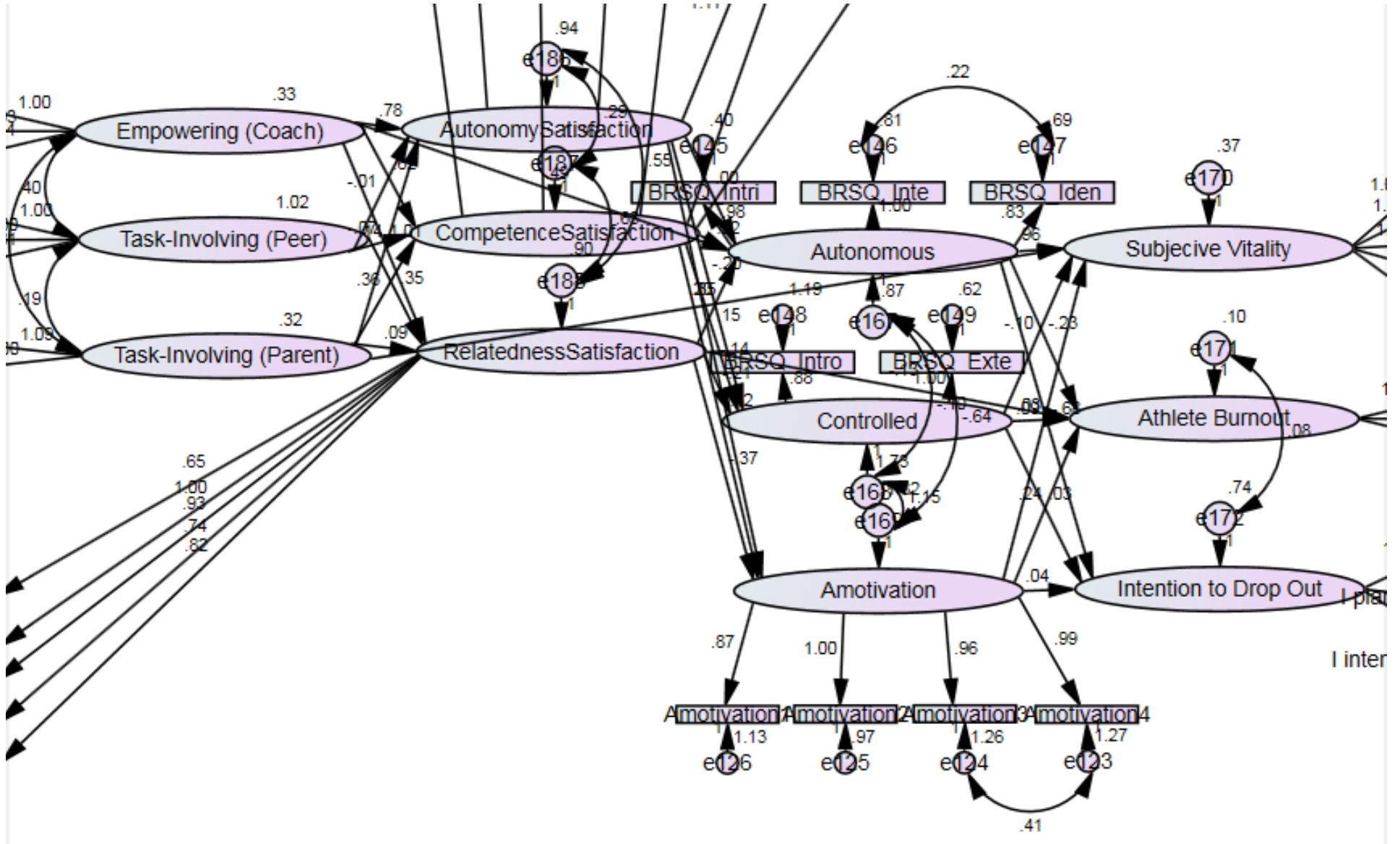
Name: Focus Group 3 Final

Description: Conducted on

¶1: **Focus Group 3 Transcript**

¶2:

¶3: Interviewees: Evelyn (A), Karen (B), Melissa (D), Teresa (E)

¶4:

¶5: Interviewer: Tsz Lun (Alan) Chu

¶6:

¶7: Date and Time: 11/15/2017 [09:29]

¶8:

¶9: Location: High School 1

¶10:

¶11: Interview duration: 55 minutes

¶12:

¶13: Interviewer: First of all, maybe just tell me your name, uh, what sports you play, and what team do you on here in [High School 1]... Anyone can start. There's not a specific order.

¶14:

¶15: Melissa: Um, I'm [Melissa]. I play basketball...

¶16:

¶17: Interviewer: What team?

¶18:

¶19: Melissa: Uh, JV.

¶20:

¶21: Teresa: Um, I'm [Teresa]. I play basketball. I'm on the JV Gold Team, which is the freshman team. I'm a sophomore.

¶22:

¶23: Interviewer: JV Gold? What's the difference.

¶24:

¶25: Teresa: Purple is like the higher one up.

¶26:

¶27: Melissa: That's like the true JV Team I guess in a way.

¶28:

¶29: Teresa: Yeah. JV Gold is like a freshman team, but sometimes they (inaudible). They call JV Gold the freshman.

¶30:

¶31: Karen: I'm [Karen]. I'm a freshman, so I'm not...I play softball but softball hasn't started, so I am not on a specific team yet

¶32:

¶33: Evelyn: And I'm [Evelyn]. And I... uh I run cross-country.

¶34:

¶35: Interviewer: So [Karen]...what sports do you play in the fall or you don't play any?=

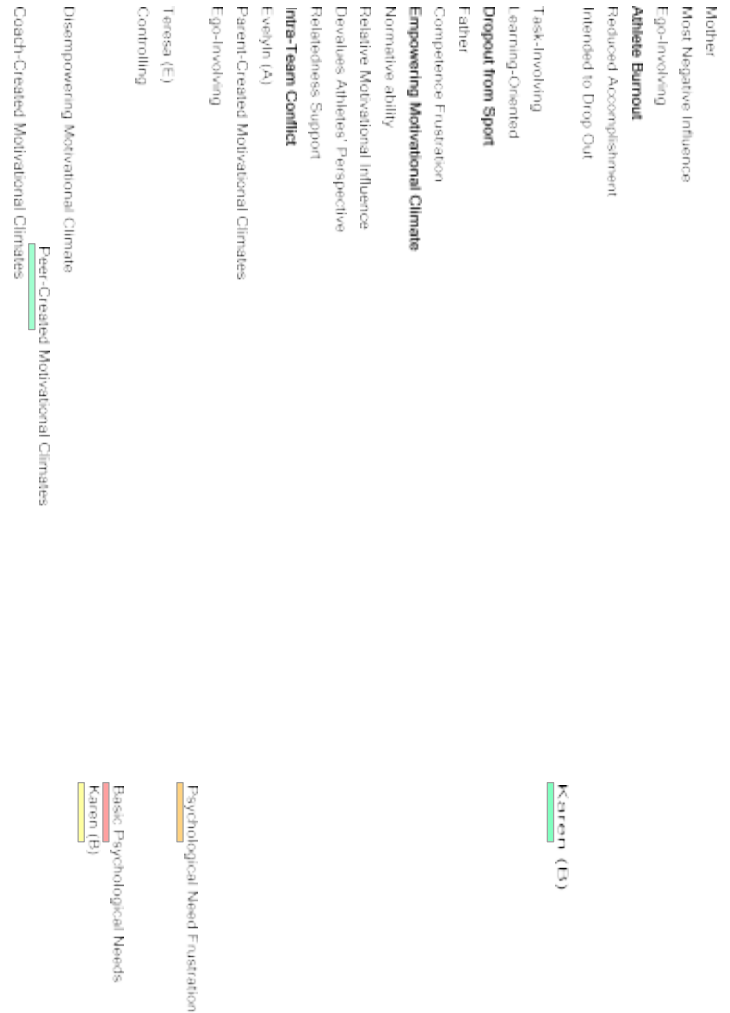¶36:

¶37: Evelyn: Softball. I play softball.

¶38:

¶39: Interviewer: Oh, okay. So you still...train but just have not=

¶40:

¶41: Evelyn: The season, the season hasn't started, so we are not on a specific team...a practice team.

¶42:

¶43: Interviewer: And then the next question I wanna ask is...um, what are some of the positive experiences that you have playing your sport in [High School 1]?

¶44:

¶45: (Pause)

¶46:

¶47: Melissa: I am not really sure, haha. (nervous laughter)

¶48: _____

¶49: Teresa: I don't know. When you're like making a basket or something, it feels good...and then there is cheers "oh yeah."

¶50:

¶51: Evelyn: Or like when you're running a meet, and your time gets slower, like... you get a better time. Then it's good. You become better and better each day.

¶52:

¶53: Melissa: I mean, I'd like (inaudible) Christmas when we do the Secret Santa, hahaha (Melissa and Teresa laughed). It's like that every sport we do Secret Santa, so we all... it's like a team bonding kind of experience.

¶54:

¶55: Karen: You get like closer with a bunch of people that... you are not really close with... in your sport.

¶56:

¶57: Interviewer: So you kind of enjoy the friendship, relationship that [you have].

¶58:

¶59: (everyone nodded)

¶60:

¶61: Teresa: [Oh yeah].

¶71: Melissa: Oh, you uh...you like pick a name of a hat from your team, and whoever you get you've to buy them... like a present that you can't tell them who you are. Like you secretly buy so you're like a Secret Santa. And on like the last practice or the game before Christmas, you all give each other the presents, but you don't, like, exactly say, that like, who it's from. You're just like put your name on it, and you got your present. Y'all get a present.

¶72:

¶73: Interviewer: And you, you never know who [or later on].

¶74:

¶75: Melissa: [Well I mean], like, some people say it after, but the whole like buying process, you're not supposed to know.

Mother
Most Negative Influence
Ego-Involving
Athlete Burnout
Reduced Accomplishment
Intended to Drop Out
Autonomy Frustration
Task-Involving
Learning-Oriented
Dropout from Sport
Father
Competence Frustration
Empowering Motivational Climate
Normative ability
Relative Motivational Influence
Devalues Athletes' Perspective
Relatedness Support
Intra-Team Conflict
Parent-Created Motivational Climates
Ego-Involving
Psychological Need Frustration
Controlling
Disempowering Motivational Climate
Coach-Created Motivational Climates

Teresa (E)
Evelyn (A)
Basic Psychological Needs
Peer-Created Motivational Climates
Karen (B)

248

¶76:

¶77: Interviewer: Okay. Did the coach organize that, or=

¶78:

¶79: Melissa: No.

¶80:

¶81: (nervous laughter from everyone)

¶82:

¶83: Interviewer: So who, who, who started that kinda like a tradition that you now=

¶84:

¶85: Melissa: Yeah, it's kinda like I guess like the leader of the team, whoever is takes the role. It's like "hey guys, y'all wanna do Secret Santa this year?" And then like "Yeah! Sure!" And then you do Secret Santa.

¶86:

¶87: 03:37

¶88: Interviewer: That sounds fun... What about on the flip side, maybe some of the negative experiences that you feel like you may have in your sport?

¶89:

¶90: (Pause)

¶91:

¶92: (Nervous laughter from a few)

¶93: Karen: I don't like the tract sweats.

¶94:

¶95: (Pause)

¶96: (Laughter)

¶97:

¶98: Evelyn: You don't like the what?

¶99:

¶100: Karen: The <u>sweats</u>.

¶101: (Laughter)

¶102:

¶103: ¶106: Karen: We have like specific outfilts we're supposed to wear. And the sweats are like really big...

¶104: ¶107:

¶105: ¶108: (Laughter)

¶109:

¶110: Melissa: Are you talking about the practice sweats?

¶111:

¶112: Karen: Like the... the hoodies and sweatpants (Melissa laughed)... I like the T-shirts, but=

¶113:

¶114: Melissa: The purple ones.

¶115:

¶116: Karen and Evelyn: Yeah.

¶117:

¶118: Karen: They are just really big and uncomfortable. (Teresa chuckled)

¶119:

Coach-Created Motivational Climates
Peer-Created Motivational Climates
Disempowering Motivational Climate
Controlling
Teresa (E)
Ego-Involving
Parent-Created Motivational Climates
Evelyn (A)
Intra-Team Conflict
Relatedness Support
Devalues Athletes' Perspective
Relative Motivational Influence
Normative ability
Empowering Motivational Climate
Competence Frustration
Father
Dropout from Sport
Learning-Oriented
Task-Involving
Intended to Drop Out
Reduced Accomplishment
Athlete Burnout
Ego-Involving
Most Negative Influence
Mother

Basic Psychological Needs
Karen (B)
Psychological Need Frustration

Karen (B)

¶120: (Pause)

¶121:

¶122: Melissa: I don't like if you mess up, and like basically any sport, if you mess up all your teammates are like... okay we're mad at you. (Nervous laughter)

¶123:

¶124: Teresa: Yeah. It, it always looks bad [when] you like, especially like when it's a close game. And then like if you like give the ball or something, everybody like gets all mad and stuff.

¶125:

¶126: Karen: [Yeah] (laughed)

¶127:

¶128: Interviewer: Does it only happen in a game, or it happens at practice too?=

¶129:

¶130: Teresa: [Both]

¶131:

¶132: Melissa: [At practice] definitely=

¶133:

¶134: Teresa: Yeah.

¶135:

¶136: Interviewer: [Karen}, you have the same experience?

¶137:

¶146: Melissa: I ran cross country, and the problem with the like, runners are really like (inaudible) nice to each other, like a giant family (laughed).

¶147:

¶148: Evelyn: I know I love that, and like cuz we're all like really close together. (looked happy)

¶149:

¶150: 05:25

¶151: **Interviewer: Do you only play one sport or you play multiple sports here?**

¶152:

¶153: Melissa: I play multiple.

¶154: Teresa: I only play one.

¶155:

¶156: Evelyn: I mean I'm kind of on track too.

¶157: