

INTRINSIC MOTIVATION & INTENTIONS TO BE PHYSICALLY ACTIVE: THE  
ROLE OF HIGH SCHOOL COACHES

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In

Kinesiology

by

Kelly Ann Thomas

San Francisco, California

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CERTIFICATION OF APPROVAL

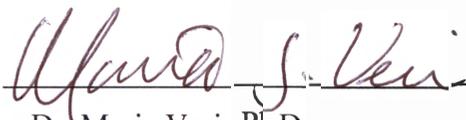
I certify that I have read Intrinsic Motivation & Intentions to be Physically Active: The Role of High School Coaches by Kelly Ann Thomas, and that in my opinion this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirement for the degree Master of Science in Kinesiology at San Francisco State University.



Dr. Nicole Bolter, Ph.D.  
Assistant Professor



Dr. Kent Lorenz, Ph.D.  
Assistant Professor



Dr. Maria Veri, Ph.D.  
Associate Professor

# INTRINSIC MOTIVATION & INTENTIONS TO BE PHYSICALLY ACTIVE: THE ROLE OF HIGH SCHOOL COACHES

Kelly Ann Thomas  
San Francisco, California  
2019

A primary goal of adolescent sport participation is to equip children with the competence and confidence to choose to participate in leisure physical activity as they transition into adulthood. Previous research on Self-Determination Theory (SDT) has shown that autonomy-supportive coaching has a positive relationship with the development of intrinsic motivation. However, the literature does not provide information about how this motivation development translates to greater exercise adherence to physical activity later in life. **PURPOSE:** The purpose of this study was to examine the relationships between perceived autonomy support, basic needs satisfaction, intrinsic motivation, and intention to be physically active among competitive high school athletes. **METHOD:** A sample of 37 high school athletes (majority white and female) completed a quantitative survey one time. **RESULTS:** Multiple regressions showed that motivation to experience ( $F(5,31) = 3.59, p=0.01$ ) was significantly predicted by only team relatedness ( $\beta=.41, p<0.05$ ). Mean scores of the entire sample ( $N=37$ ) showed that intention to be physically active decreased as temporal distance increased. Hierarchical regression revealed that intrinsic motivation ( $\beta=.35, p<0.05$ ) and teammate relatedness ( $\beta=.35, p<0.05$ ) were the only significant predictors of intention. **DISCUSSION:** Findings suggest that the teammate relatedness component of basic needs satisfaction and intrinsic motivation are the only significant predictors of changes in intention, while coach autonomy support is not. It can be said that high school athletes that are most motivated by their experience, rather than their accomplishments and knowledge within their sport, and feel connected to their teammates are more likely to be physically active in college.

I certify that the Abstract is a correct representation of the content of this thesis.

Nicole Batten

Chair, Thesis Committee

5/16/19

Date

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Regular physical activity has been shown to promote positive youth development, which occurs when children develop personal skills necessary to become a functioning member of society (Weiss & Wiese-Bjronstal, 2009). While ‘physical activity’ is an umbrella term that takes on many forms, the current research will focus on organized youth sport for its unique social context that has the potential to facilitate many developmental assets such as character, responsibility, initiative, motor skills, and physical fitness. One of the primary goals of adolescent sport participation is to equip children with the skills and competence to choose to participate in physical activity at their leisure (Almagro, Saenz-Lopez, & Moreno, 2010; Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003). It has been well established that participation in youth sport has many physical health benefits, including reduced risk of cardiovascular disease, obesity, and diabetes (Weiss & Wiese-Bjronstal, 2009). Although the physical health benefits of youth sport participation have been thoroughly researched, the long-term effects of participation on lifelong physical activity behaviors are not as extensively researched. (Conroy & Coatsworth 2007; Weiss & Wiese-Bjronstal, 2009). This research will contribute to a better understanding of the psychological processes underlying adherence to physical activity by studying different types of intrinsic motivation and its relationship with intention to be physically active.

Adolescence is a critical developmental period for young athletes; they will either develop habits that will commit them to regularly participating in physical activity, or may abandon exercise altogether (Almagro et al., 2010). Motivational variables have

been shown to hold a strong connection with physical activity behaviors (Blanchard 2012; Hein & Koka 2004; Pelletier et al., 1995). For example, Wang et al. (2002) examined the differences between clusters of motivation and physical activity behaviors in adolescents (11-14 years). Motivation was clustered by 'highly', 'moderately', and 'lowly' motivated. Results of this study found that physical activity behaviors were highest in those that were in the highly motivated cluster, which suggests that motivation is considered to have a major developmental influence on adolescents in social sport environments. In particular, coaches are key contributors to the future physical activity behaviors of youth athletes, including their motivation or lack of motivation towards exercise adherence (Almagro et al., 2010; Conroy & Coatsworth 2007; Jowett & Duda, 2008). In order for training and competition to foster athletic engagement, young athletes must be motivated by the climate created by their coaches (Almagro et al., 2010). Therefore, researchers have taken interest in the motivational climate created by coaches in youth sport and the effect this climate has on the development of future physical activity behaviors.

### **Self-Determination Theory**

Self-Determination Theory (SDT) has been proposed as a way to better understand the influence of coaches on athletes' motivation and describes the multiple constructs that influence the physical activity behavior change process (Hagger et al., 2002). The theory suggests that humans intentionally pursue their behaviors and actions without external influence, which results in a positive self-worth (Ryan & Deci, 2000).

SDT provides an understanding of the motivation that drives volitional behaviors (Hagger et al., 2003) by distinguishing between different types of motivation: intrinsic, extrinsic, and amotivation (Ryan & Deci, 2000). These differentiations aid in understanding the adaptive and maladaptive motivational profiles of adolescent athletes and how coaches may influence them.

Intrinsic motivation results in behaviors that are done for enjoyment and interest with no external reinforcement (Hagger et al., 2003; Pelletier et al., 1995). Individuals who are intrinsically motivated have a tendency to seek out challenges and new possibilities. Self-determined, intrinsic motivation can be categorized as motivation to know, motivation towards accomplishment, and motivation towards experience stimulation (Vallerand & Losier, 1999). In relation to athletics, athletes who attend practice for the enjoyment of the sport, satisfaction of learning more about their sport, and focus on constantly surpassing themselves are considered intrinsically motivated (Pelletier et al., 1995).

On the other hand, extrinsic motivation relates to behaviors that are done as a means to an end, not simply for enjoyment and satisfaction. Deci and Ryan (2000) have proposed that extrinsic motivation can be broken up into different types (i.e., external regulation, introjection, identification, and integration) and ordered along a self-determination continuum. Pelletier et al. (1995) describes these types of extrinsic motivation and their relation to youth sport. Athletes experience externally regulated motivation when they participate in sport for praise from their coach or because they feel

pressure to do so by their parents. In this example, participation in sport is done to obtain rewards, rather than for the enjoyment. Introjection occurs when athletes have internalized a formerly external source of external motivation. For example, an athlete may experience introjected motivation if they feel embarrassed when they are not in their best form for their sport. With identification, an individual begins to value a behavior as important and begins to participate in that behavior out of choice. However, that activity is still performed for extrinsic reasons; in sport, an athlete may participate because they feel their involvement will help them reach their personal goals. Finally, integrated motivation occurs when engaging in a behavior becomes a part of an individual's identity. In relation to sport, a person may continue to participate because their participation is congruent with their sense of self.

The final form of motivation in SDT is amotivation, which occurs when individuals do not see the connections between their actions and the potential outcomes of these actions (Pelletier et al., 1995). Athletes in this state are neither intrinsically nor extrinsically motivated; instead, they cannot identify any good reasons to continue to practice their sport. This type of motivation will most likely lead to sport dropout (Pelletier et al., 1995).

Motivation is highlighted in SDT because it is strongly connected to the satisfaction of the basic psychological needs described in the theory. According to the theory, humans have three basic psychological needs: autonomy, competence, and relatedness (Vlachopoulos & Michailidou, 2006). The need for autonomy describes a

person's desire to be the source of their own behaviors and actions. In relation to sport, coaches can increase their athletes' sense of autonomy by offering the team choices between different drills during practice. This structure allows young athletes to feel like they have some control in their engagement in sport. The need for competence refers to a person's need to demonstrate their capacities effectively. Coaches can boost athletes' sense of competence by giving them sport-specific, positive reinforcement immediately after they perform a specific skill. Relatedness refers to a person's desire to feel connected to others. Although youth athletes tend to get a sense of relatedness through their connection to their teammates, coaches can promote relatedness by incorporating team-building activities into their athletic season. According to SDT, satisfaction of the three basic psychological needs is associated with a higher amount of intrinsic motivation (Vlachopoulos & Michailidou, 2006). In relation to sport, satisfaction of autonomy, competence, and relatedness would lead to development of more intrinsic motivation, which would likely lead to adherence to sport participation and potentially long-term physical activity behaviors.

In regards to the youth sport environment, research has shown that autonomy-supportive coaching will positively influence an athlete's basic psychological needs as outlined by SDT (Almagro et al., 2010). Autonomy support is characterized as a structure that allows one to have a say in decision making, opposes control, encourages initiation, and avoids pressure during participation (Adie, Duda, & Ntoumanis, 2012). Conroy and Coatsworth (2007) examined the psychometric properties of the Autonomy-Supportive

Coaching Questionnaire in young athletes (7-18 years). They found that interest in athletes' input and praise for autonomous behavior were two factors that predicted the satisfaction of the basic psychological needs of the SDT. This study concluded that autonomy-supportive coaching should be considered to have a positive relationship with motivation. In a similar study, Joesaar et al. (2011) investigated the relationship between perceived coach autonomy-support and athletes' intrinsic motivation in young athletes (11-16 years). The results of this study suggest that perceived autonomy-support from the coach can predict athletes' intrinsic motivation.

Although previous research has shown that autonomy-supportive coaching in youth sport has a positive relationship with the development of intrinsic motivation, literature does not provide information about how this motivation development would translate to greater exercise adherence later on in life. Despite the extensive research and information available on the physical benefits of regular participation in physical activity, a staggering number of active high school students may become sedentary college students. For example, while 65% of high school students report regular vigorous activity, only 38% of college students participate in regular vigorous activity and almost half of college students report a decrease in physical activity following high school graduation (Deliens et al., 2015). One way to address this decline in activity may be to understand whether intrinsic motivation in high school athletics has any lasting impact on future physical activity behaviors. In order to gain a better understanding of physical activity behaviors in college, research needs to examine whether intrinsic motivation in

high school sport leads to more (or less) motivation to exercise in college. To begin measuring this relationship, research must examine the relationship between motivation in high school athletes and their intention to adhere to physical activity behaviors in college.

### **Integrating Theory of Planned Behavior**

One theory that highlights the importance of intention is the Theory of Planned Behavior (TPB). More specifically, the TPB states that a person's behavior is determined by their intention. Intention is an indicator of how much effort a person plans on putting towards a particular behavior. In this theory, intention is determined by a person's attitude towards the behavior, the person's perception of control they have over the performance of the behavior, and the person's perception of the wishes of other people (Norman & Conner, 2005). One thing to take into consideration when using the TPB in research is the temporal distance between the time intention is measured and the time the action will be performed. Suh and Hsieh (2016) suggest that as temporal distance increases, the more likely someone is to change their intentions towards the behavior. In particular, research has shown that there is a tendency to overcommit to future events when the event is farther in the future. This may be due to the fact that when a targeted behavior is farther away, people focus on why they will perform an action. However, as the time to perform the targeted action approaches, people start to focus on how they will perform the action. Focusing on the logistics required to carry out a future behavior means that people are more likely to evaluate their intention more realistically. The

current research will decrease temporal distance between the measurement of intention and the performance of future physical activity behaviors in college by limiting the participant population to high school students.

Researchers have recently argued that integrating multiple theories is needed to better understand the psycho-social implications of physical activity and overall advance health behavior literature (Blanchard, 2012). While both theories mentioned (SDT and TPB) are effective independently, each have shortcomings that may be overcome by integrating the two. For instance, SDT does not outline the process in which motivation is converted into intention and thus, behavior. On the other hand, TPB is not able to explain the origins of the events leading up to behavior (Hagger et al., 2002). Researchers have suggested that integrating these two theories could explain their shortcomings and create a unified model of motivation that describes intention and behavior in physical activity. This integration will be particularly valuable in the present study focused on understanding the correlates of athletes' motivation for high school sports and their intention to engage in physical activity in college. Because of the relationship between time and the TPB, the current research will attempt to minimize the effect of temporal distance on the accuracy of intention measures by focusing on high school athletes (age 14-18 years). Previous research on youth athletes has neglected to define what constitutes 'future' physical activity behavior, thus making future behaviors indefinite. Without a definition of 'future', the temporal distance between the statement of intention and the future behavior is immeasurable, thus increasing the tendency to overcommit and

lessening the likelihood of carrying out the targeted actions. The current research will be the first to measure intention in high school aged athletes and to define the timeline of future physical activity behaviors (in college), thus minimizing the temporal distance between the statement of intention and the performance of the future behavior.

### **Summary and Limitations of Previous Research**

As a collective summary, research has shown that autonomy-supportive coaching has a positive relationship with the development of motivation in young athletes (e.g. Almagro et al., 2010; Adie et al., 2012; Joesaar et al., 2012). These research studies have also shown a positive relationship between autonomy-supportive coaching and intention to adhere to future physical activity behaviors.

One limitation of research in this area is that studies examining the integration of the SDT and the TPB through the relationship between three components (coach autonomy-support, development of motivation, and intention to adhere) are lacking. A few studies have integrated elements of SDT and TPB to study young athletes' motivation and intention to be physically active. Hagger et al. (2002) looked to research focused on how motives from SDT influence intentions to perform physical activity within TPB. Young athletes (12-14 years) completed self-report questionnaires related to intentions, attitudes, subjective norms, and perceived behavioral control towards physical activity participation. These surveys were assessed using a TPB questionnaire. Results of this study suggest that general autonomous motives are in play when children make decisions to participate in physical activity. These results suggest that coaches may

positively influence future physical adherence by increasing autonomy support in their athletes. A similar study by Hagger et al. (2003) examined the integration of the SDT and the TPB in high school students. Perceived autonomy support and constructs of the TPB were assessed in physical education and leisure-time physical activity. Results of this study suggest that perceived autonomy support in an educational context influences motivation in a leisure-time context.

Almagro et al. (2010) is the only study to date to examine all three of these components in one study. Young athletes (12-17 years) involved in competitive sport completed measures relating to coach autonomy-support, perceived autonomy, intrinsic motivation, and intention to be physically active. Findings suggested that coach autonomy-support predicts an athlete's perceived autonomy, which in turn predicts intrinsic motivation. Additionally, athletes with a high perception of autonomy and intrinsic motivation were more likely to adhere to physical activity behaviors in the future. The research done by Almagro et al. (2010) provided a good starting point for understanding how the integration of components of the SDT and the TPB can help scientists gain a better understanding of motivation's role in exercise adherence. Therefore, more research is needed to better understand how integrating these theories may offer insight to intentions to exercise in the future.

Another limitation in this area of research are the populations studied. As mentioned, previous research (e.g., Almagro et al., 2010; Hagger et al., 2012) on athletes and intention to be physically active have a participant age range beginning at 12 years of

age, which lengthens the temporal distance between the measurement of intention and the performance of future physical activity behaviors. One study that did focus on 14-18 year olds was conducted by Hein, Muur, and Koka (2004), which examined intention to be physically active after graduation and its relationship to different types of intrinsic motivation. However, this study did not specifically look at competitive high school sports, nor did it measure intention for physical activity adherence at specific time points. Particularly in competitive high school athletics, task-contingent rewards are common. For example, coaches structure their training in advance and athletes are continually evaluated by their coaches to determine which athletes will earn playing time during competition. Furthermore, athletes' choice is very limited because coaches are in charge of developing competitive strategies. Unfortunately, the very nature of competitive high school athletics does not lend itself to coach autonomy-support and may actually encourage more extrinsic motivation over intrinsic motivation. Therefore, research focusing on competitive high school athletes (14-18 years old) must be conducted to gain a better understanding of the physical activity dropout that occurs during the transition from high school to college.

### **Purpose and Hypotheses**

The purpose of this research was to examine the relationship between basic need satisfaction, coach autonomy support, and intrinsic motivation. This research also assessed intention to be physically active at varying temporal distances after high school graduation. Additionally, this research sought to find a relationship between intrinsic

motivation and intention to be physically active in a competitive high school sport population. This was the first study to minimize the effect of temporal distance on planned behaviors by focusing specifically on high school-aged athletes and their transition to college. This study was also the first to measure high school aged athletes' intention to be physically active in their first year of college, as well as after college and throughout their lifetime. These goals were accomplished by integrating the SDT and the TPB first by measuring the relationship between coach-autonomy support and development of motivation and then examining the relationship between types of motivation and intention to be physically active in college. Future physical activity behavior were defined by the ACSM guidelines for cardiorespiratory exercise (30-60 minutes of moderate-intensity exercise five days per week). Intention to be physically active was measured using four, seven-point Likert scale questions, which can be found in the measures section of this review. It was hypothesized that higher levels of perceived autonomy support from coaches will correlate with higher levels of intrinsic motivation. It was also hypothesized that higher levels of intrinsic motivation will correlate with a stronger intention to be physically active in college.

### **Method**

#### **Participants**

The sample included 37 high school students between the ages of 14 and 17 years ( $M= 15.16 \pm .99$ ) who were surveyed. As shown in Table 1, the sample was comprised of primarily female subjects ( $N=27$ , 73% of sample) and the predominant ethnicity of the

**Table 1: Characteristics of Participants (mean  $\pm$  SD, %, N=37)**


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<b>Gender</b>	
Male	27%
Female	73%
<b>Age (years)</b>	15.16 $\pm$ .99
<b>Grade</b>	
Freshman	35.1%
Sophomore	21.6%
Junior	37.8%
Senior	5.5%
<b>Ethnicity</b>	
Asian/Pacific Islander	8.1%
Black or African American	2.7%
Hispanic or Latino	2.7%
White	73%
More than one	13.5%
<b>Sport</b>	
Cross Country	18.9%
Soccer	18.9%
Tennis	16.2%
Track	5.4%
Volleyball	40.5%
<b>Seasons Completed</b>	
One	21.6%
Two	35.1%
Three	5.4%
First Year Participating	37.8%
Intention to Attend College (% 'Yes' response)	97.3%
Verbal Commit (% 'No' response)	100
National Letter of Intent (% 'No' response)	100%

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population was white ( $N=27$ , 73% of sample). All participants were active members of competitive, organized interscholastic sport programs. These athletes were participating in cross country, soccer, tennis, track, and volleyball. The sample was collected exclusively from interscholastic sports teams from a private, college preparatory high school and excludes sport clubs outside of school. All schools, coaches, and student-athletes participated on a voluntary basis.

## Measures

*Basic Needs in Sport Scale (BNSS)*: The autonomy and relatedness factors from the BNSS, a scale described by Ng, Lonsdale, and Hodge (2010), were utilized. The relatedness factor was defined by two variables: teammate relatedness and coach relatedness. This part of the scale uses 12 items answered on a Likert scale ranging from 1 (*Not at all true for me*) to 5 (*Completely true for me*). In this study, the analysis of reliability found the following Cronbach's alphas: .62 for autonomy, .81 for teammate relatedness, and .88 for coach relatedness.

*Athletic Competence Subscale (ACS)*: The validated version of the 5-item ACS, referenced from a previous study conducted by Kipp and Weiss (2012), was utilized. The scale asks about items related to perceived competence surrounding sport skills. Each question contained two choices, and the athlete was instructed to choose which choice they most strongly related to, and then mark how strongly they related to that choice. For example, the first item had the option of selection between "some people do very well at

their sport” and “other people don’t feel that they are very good when it comes to their sport”. Once the athlete had chosen which of the two statements most related to them, they then selected if the item was “sort of true for me” or “really true for me”. In this study, the analysis of reliability found a Cronbach’s alpha of .67.

*Sport Climate Questionnaire (SCQ)*: The validated version of the 6-item SCQ was utilized, in reference to previous research conducted by Lim and Wang (2009). This scale asks about items that are related to experience with one’s coach as it pertains to perceived autonomy support. The answers were responded to with a Likert scale that ranges from 1 (*Strongly disagree*) to 7 (*Strongly agree*). In this study, the analysis of reliability found a Cronbach’s alpha of .92.

*Sport Motivation Scale (SMS)*: The three factors that measure intrinsic motivation from the validated version of the SMS were utilized, in reference to previous research conducted by Pelletier et al. (1995). This part of the scale uses 12 items to measure intrinsic motivation. Specifically, this part of the scale differentiates between three types of intrinsic motivation; to know, to accomplish, and to experience. The answers were responded to with a Likert scale that ranged from 1 (*Does not correspond at all*) to 7 (*Corresponds exactly*). In this study, the analysis of reliability found the following Cronbach’s alphas: .83 for motivation to know, .91 for motivation to accomplish, .85 for motivation to experience, and .91 for the total internal consistency of all three subscales combined (defined as intrinsic motivation).

*Intention to be Physically Active (IPAS)*: The IPAS scale was created by the researcher for the purposes of this study. It is composed of four items for measuring the participant's intention of being physically active at various temporal distances after high school graduation. The questions for this scale were as follows:

1. I intend to exercise throughout my first year of college for at least 30 minutes per day, 5 days a week
2. I intend to exercise throughout college for at least 30 minutes per day, 5 days a week
3. I intend to exercise after college for at least 30 minutes per day, 5 days a week
4. I intend to exercise for the rest of my life for at least 30 minutes per day, 5 days a week

Temporal distance was measured from the time the survey was completed to the time each item described. In the example of "I intend to exercise throughout my first year of college....", the temporal distance is from the present (when the athlete was completing the survey) to the time the athlete was in their first year of college. For a senior athlete, the temporal distance for this item would be approximately one year. Each item defined exercise by the ACSM guidelines for cardiorespiratory exercise of 30 minutes per day, 5 days per week. The answers were responded to with a Likert scale that ranged from 1 (*Strongly disagree*) to 7 (*Strongly agree*). In this study, the analysis of reliability found a Cronbach's alpha of .91.

## **Procedure**

In order to conduct this research, institutional review board (IRB) approval was obtained from the IRB committee at San Francisco State University. Prior to recruitment and data collection, a pilot study was conducted with five high school students who were members of the basketball team to ensure that the survey questions being asked were understood by high school aged students. No issues with comprehension of survey questions was noted by the pilot group. The administrators of the school were then contacted and were informed of the purpose of the study and asked for permission to invite their athletes to participate in the study. Once consent for participant recruitment was received from the administrators of the school, the researcher attended a practice session to invite athletes to participate in the study and distribute parent consent forms. Additionally, a parent letter, including a parent consent form, was emailed to parents explaining the purpose of the study. In order to eliminate coercion and ensure athlete privacy and confidentiality, coaches were not involved in the recruiting process of the athletes. The researcher returned one week later to administer the survey, which included a youth assent form, to athletes who had signed parent consent forms. The survey, which can be found in the appendix of this paper, was administered in a classroom away from their coach.

## **Results**

Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. These analyses showed that the variables were normally distributed and values of skewedness and kurtosis were within appropriate ranges. Data analysis procedures were followed from Pallant's 2010 SPSS manual and SPSS software was utilized to run statistical analyses. Table 2 displays the mean scores for the entire sample ( $N=37$ ). On average, participants felt moderately autonomous, competent, and connected to their coaches. The population felt highly connected to their teammates and was highly intrinsically motivated. Overall, the participant population had moderately high intentions to be physically active, however the mean scores of each individual intention item show decreased exercise intentions as temporal distance increased. Cronbach alpha's for the scales were all above .70, with the exception of the Autonomy and Competence scales.

Correlations were used to explore the relationship between the mean scores on all variables for the entire sample ( $N=37$ ) (see Table 3). There was a moderate correlation between intrinsic motivation and intention ( $r=.538, p<0.01$ ). Coach autonomy support only showed a strong correlation with coach relatedness ( $r=.843, p<0.01$ ) and a moderate correlation with autonomy ( $r=.467, p<0.01$ ). Of the basic needs, intrinsic motivation only showed a moderate correlation with autonomy ( $r=.339, p<0.05$ ) and team relatedness ( $r=.358, p<0.05$ ).

**Table 2: Means and Standard Deviations for Entire Sample (N=37)**

	<b>Response Scale</b>	<b>Alpha</b>	<b>M</b>	<b>SD</b>
<b>Basic Needs in Sport</b>				
Autonomy	1-5	.62	3.45	.62
Team Relatedness	1-5	.81	4.44	.81
Coach Relatedness	1-5	.88	3.89	.88
<b>Athletic Competence Subscale</b>				
Competence	1-4	.67	2.49	.68
<b>Sport Climate Questionnaire</b>				
Coach Autonomy Support	1-7	.92	4.62	.92
<b>Sport Motivation Scale</b>				
To Know	1-7	.83	5.00	.84
To Accomplish	1-7	.91	5.78	.91
To Experience	1-7	.85	5.70	.86
Intrinsic Motivation	-	.91	5.49	.99
<b>Intention to be Physically Active</b>				
1 <sup>st</sup> year of college	1-7	-	6.08	-
Throughout college	1-7	-	5.97	-
After college	1-7	-	5.81	-
Lifetime	1-7	-	5.21	-

**Table 3: Correlations**

	1	2	3	4	5	6	7
1. Competence							
2. Autonomy	.263						
3. Team Relatedness	.595**	.307					
4. Coach Relatedness	.106	.467**	.144				
5. Coach Autonomy Support	.282	.679**	.278	.843**			
6. Intrinsic Motivation	.226	.339*	.358*	.231	.290		
7. Intention	.521**	.248	.610**	.342	.313	.538**	

*\*\*Correlation is significant at the 0.01 level*

*\*Correlation is significant at the 0.05 level*

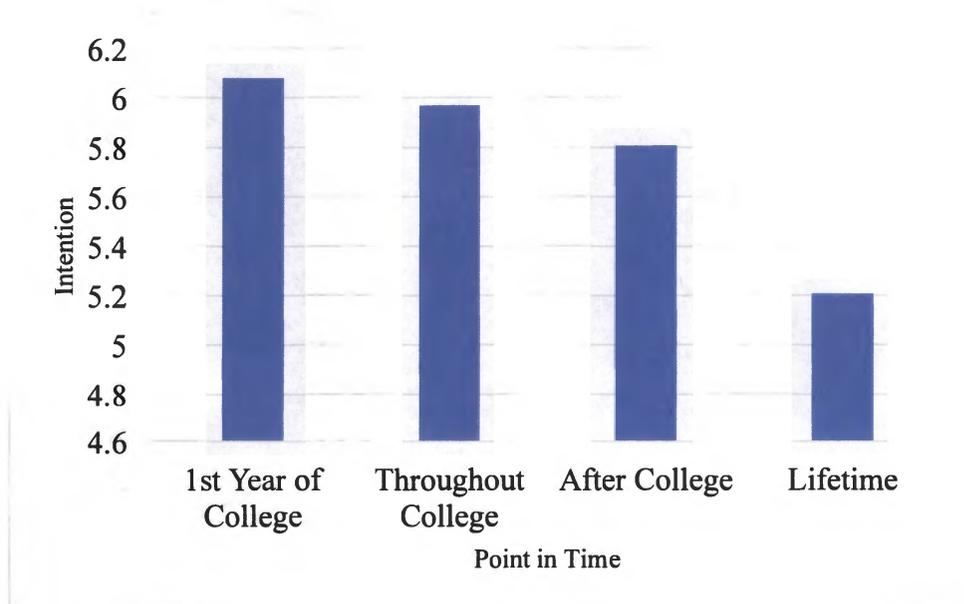
Multiple regression was used to assess the ability of four variables (competence, autonomy, teammate relatedness, coach relatedness, and coach autonomy support) to predict intrinsic motivation. Three separate regressions were performed for each subcategory of intrinsic motivation: motivation to know, motivation to accomplish, and motivation to experience.

Motivation to know ( $F(5,31) = 1.27, p=0.30$ ) and motivation to accomplish ( $F(5,31) = .88, p=0.50$ ) were not significantly predicted by the independent variables. Motivation to experience ( $F(5,31) = 3.59, p=0.01$ ) was significantly predicted by only team relatedness ( $\beta=.41, p<0.05$ ). Autonomy ( $\beta= .02, p=0.93$ ), competence ( $\beta=.09,$

$p=0.62$ ), coach relatedness ( $\beta= -.05, p=0.86$ ) and coach autonomy support ( $\beta=.29, p=0.41$ ) did not significantly predict motivation to experience.

Intention to be physically active was measured at four different points in time; during the first year of college, throughout college, after college, and for the remainder of life. Average intention to be physically active decreased as temporal distance increased, which was highlighted by the difference in mean score from the closest temporal distance of 1<sup>st</sup> year of college ( $M=6.08$ ) to the farther temporal distance of for life ( $M=5.21$ ).

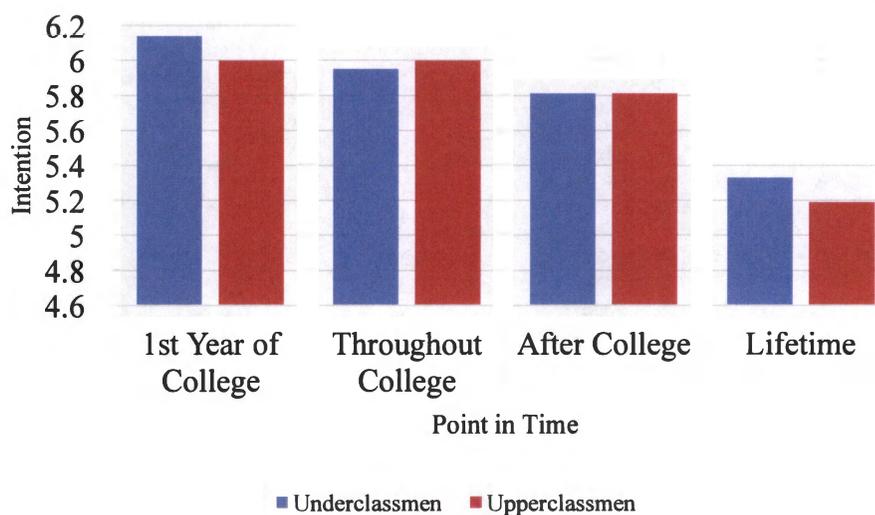
**Figure 1: Intention to be Physically Active: Mean Scores**



Intention to be physically active was compared between underclassmen ( $N = 21$  freshmen and sophomores) and upper classmen ( $N = 16$  juniors and seniors) (see Figure

2). Both groups showed a decrease in intention as temporal distance increased. At the temporal distance of after college, both upper and underclassmen had a mean intention score of 5.81. When the temporal distance was increased to lifetime, Underclassmen had a decrease in intention to 5.33, while upperclassmen had a farther drop to 5.19. Independent t-tests were performed to compare the mean scores between groups, and no significant differences between the groups emerged.

**Figure 2: Intention to be Physically Active: Underclassmen vs Upperclassmen**



Hierarchical multiple regression was used to assess the ability of six measures (intrinsic motivation, basic needs satisfaction, and coach autonomy support) to predict intention (intentions to be physically active). This type of statistical analysis permits variables to be entered in steps in a predetermined order (Pallant 2010). This allows for the contribution of the sequentially ordered independent variables to be analyzed

separately to see if some, or all of the independent variables contribute to the variance in the dependent variable. Results of this analysis can be found in Table 4. Intrinsic motivation was entered at Step 1, explaining 28.9% of the variance in Intention. After entry of basic needs satisfaction (competence, autonomy, coach

**TABLE 4: Predicting Intention to be Physically Active**

	R Square	R Square Change	$\beta$	p value
<b>Step 1:</b>	.289	--	--	.001
Intrinsic Motivation		--	.54	.001
<b>Step 2:</b>	.581	.292	--	.002
Intrinsic Motivation			.35	.01
Autonomy			-.17	.24
Competence			.25	.10
Teammate Relatedness			.35	.03
Coach Relatedness			.26	.06
<b>Step 3:</b>	.605	.024		.19
Intrinsic Motivation			.35	.01
Autonomy			-.04	.80
Competence			.30	.06
Teammate Relatedness			.35	.03
Coach Relatedness			.52	.02
Coach Autonomy Support			-.38	.19

relatedness, teammate relatedness) at Step 2, the additional variables accounted for 29.2% of the variance of intention and the total variance explained by the model as a whole was 58.1%. After entry of coach autonomy support at Step 3, this additional variable

accounted for only 2.4% of the variance in intention and the total variance explained by the model as a whole was 60.5%. These measures were inputted in this sequence in order to mirror the hypothesized integrated model of SDT and TPB in which coach autonomy support predicts basic need satisfaction, which predicts intrinsic motivation, and then predicts intention to be physically active.

The addition of the basic needs satisfaction at step 2 showed significant contributions from intrinsic motivation ( $\beta = .35, p < 0.05$ ) and teammate relatedness ( $\beta = .35, p < 0.05$ ) for predicting intention. The addition of coach autonomy support in step 3 did not create a more significant contribution to variance in intention to be physically active. Intrinsic motivation ( $\beta = .35, p < 0.05$ ) and teammate relatedness ( $\beta = .35, p < 0.05$ ) remained significant, and coach relatedness became a significant contributor ( $\beta = .52, p < 0.05$ ).

## **Discussion**

In line with SDT, the first purpose of this research was to examine the relationship between basic needs satisfaction, coach autonomy support and intrinsic motivation in high school athletes. Multiple regressions were conducted to assess the ability of four variables (autonomy, competence, teammate relatedness, coach relatedness, coach autonomy support) to predict intrinsic motivation. This multiple regression was performed for the three types of intrinsic motivation (motivation to know, motivation to accomplish, and motivation to experience) to test the hypothesis that higher

levels of perceived coach autonomy support would be correlated with a higher intrinsic motivation. These multiple regressions showed that only motivation to experience was able to be predicted by any of the variables, while motivation to know and motivation to accomplish were not predicted by any variables. Of the five variables included in the regression, teammate relatedness was the sole significant predictor for motivation to experience.

These results are contradictory to the stated hypothesis: based on SDT, coach autonomy support should predict satisfaction of the basic needs, which in turn should predict intrinsic motivation. One possible explanation for why the results of the current study deviated from the expected results outlined by SDT is the age range of the population being surveyed. The current research focused on high school athletes (14-18 years) participating on interscholastic sports teams. Developmentally, peers are an important source of acceptance and friendship, which helps to shape views towards competition and compromise while also providing the opportunity for self-validation (Smith, 2003). Many high school students are motivated to participate in their school's sports programs for the enjoyment they find in experiencing camaraderie with their peers. While mastering sports skills (motivation to know) and winning games (motivation to accomplish) is an enjoyable component of competitive sport, it is often the experience with peers that motivates, or hinders, high schoolers from staying motivated in their sport.

The second purpose of this research was to evaluate intention to be physically active at a variety of temporal distances after high school graduation to address the gap in previous research surrounding TPB and physical activity adherence. Previous research suggests that as temporal distance increases, the more likely someone is to change their intentions towards the behavior (Suh & Hsieh, 2016). More specifically, research has shown there is a tendency to overcommit to future events when the event is farther in the future. However, as the time to perform the targeted action approaches, people start to focus on how they will perform the action. Having to consider the logistics of how an action is going to be carried out often prevents people from overcommitting to a future event.

Based on this previous research, it would be expected that the participants in the current study would show a decrease in physical activity intentions as temporal distance increased. However, the mean scores of the IPAS showed the opposite effect for all grade levels; as temporal distance increased, intention to be physically active decreased. Knowing that intrinsic motivation in the current population is significantly impacted by the satisfaction of teammate relatedness may help to explain why their intention towards exercise does not follow the expected pattern of behavior and temporal distance. For an individual, such as those in the current participant group, whose intrinsic motivation is significantly impacted by their sense of relatedness, their ability to envision their community is going to have an impact on their intentions. The responses from

participants in this research was could have been influenced by their thoughts on their future friend groups and communities.

For example, it is important to note that of the 37 participants surveyed in this study, all but one indicated that they intend to go to college, meaning that those 36 students envisioned themselves on a college campus in the future. Participants had their highest intentions towards physical activity at the nearest temporal distance point; year one in college. The first year of college presents an array of opportunities for new friend groups, intramural sports, on campus rec centers, and more. High intentions towards physical activity were measured at the second temporal distance point, throughout college, which yielded similarly high intentions towards physical activity. As temporal distance increased beyond college (temporal distances of 'after college' and 'lifetime'), intention began to drop. Perhaps the participants in this study had difficulty envisioning the type of community they would be immersed in after college, which would explain a drop in their future commitment to be physically active.

The final purpose of this research was to examine the relationship between intrinsic motivation and intention to be physically active. It was hypothesized that higher levels of intrinsic motivation would be correlated with higher levels of intention to be physically active. Analyses showed a significant relationship between intrinsic motivation and intention to be physically active ( $r=.538, p<0.01$ ), which supports the hypothesized theory that intrinsic motivation is associated with intention.

In order to better understand the factors influencing participants' intentions, hierarchical multiple regression was used to assess the ability of three measures (intrinsic motivation, basic needs satisfaction, and coach autonomy support) to predict intention. These measures were inputted in this sequence in order to mirror the hypothesized integrated model of SDT and TPB in which coach autonomy support predicts basic need satisfaction, which predicts intrinsic motivation, and then predicts intention to be physically active. Of the variables tested in this hierarchical regression, intrinsic motivation explained 28.9% of the variance in intention, basic needs satisfaction explained 29.2% of variance in intention, and coach autonomy support explained 2.4% of the variance in intrinsic motivation. While the hierarchical regression model that included coach autonomy support did significantly contribute to the variance in intention, it did not explain significantly more of the variance than the hierarchical regression model that excluded coach autonomy support. In looking at the hierarchical regression in Step 2, the only variables that had a significant contribution to variances in intention were intrinsic motivation ( $\beta=.35, p<0.05$ ) and teammate relatedness ( $\beta=.35, p<0.05$ ).

These findings differ from the predicted theory, which states that coach autonomy support is directly related to basic need satisfaction, which predicts intrinsic motivation, which leads to intention. Rather, these findings suggest that the teammate relatedness component of basic needs satisfaction and intrinsic motivation are the only significant predictors of changes in intention, while coach autonomy support is not. The unique social context of high school sports seems to influence motivation and prediction of

behaviors in ways that previous research has not yet explored. Given that this participant sample is comprised of high school athletes, it is not surprising that relationships with their peers has a major influence on their behaviors. Perhaps more important than control over their sport experience, or confidence in their ability to perform their sport, is their ability to fit in with those around them (Stanger et al., 2018). If a high school student feels accepted, supported, and enjoys being with their teammates, they are less likely to feel self-conscious about their sport competence or concerned with their control over the things their coaches are implementing. On the other hand, if a high school athlete does not feel they fit in with their teammates, they are more likely to worry about being judged for their sport abilities and may concern themselves more with what is being asked of them in practice and competition.

Additionally, intrinsic motivation was revealed to be a significant predictor of intention. As stated by Hagger et al. (2003), SDT provides an understanding of the motivation that drives volitional behaviors by distinguishing between different types of motivation. Intrinsic motivation results in behaviors that are done for enjoyment and interest, while extrinsic motivation leads to behaviors that are done as a means to an end, rather than for enjoyment. Considering this, it makes sense that higher levels of intrinsic motivation were associated with greater intention to adhere to physical activity. A key to the IPAS is the measurement of intention to adhere to physical activity during and after college, when the structure of interscholastic high school sports is removed. To continue to exercise in a setting beyond high school, individuals need to find some sort of

enjoyment in the activities they are participating in so they are more likely to maintain an active lifestyle. It is also important to note that none of the participants in this study had signed a national letter of intent or verbally committed to playing interscholastic sports in college, meaning their future physical activity behaviors in college were not already determined for them.

The findings of the current research can be summarized to conclude the following; Of the basic needs and coach autonomy support variables, teammate relatedness is the only predictor for motivation to experience. Knowing that intrinsic motivation and intention to be physically active are positively correlated, it can be suggested that the influence of teammate relatedness on motivation to experience is key in developing intentions to adhere to future physical activity behaviors. In this population, intention to adhere to physical activity decreases as temporal distance increases. Considering all of this, it can be said that high school athletes that are most motivated by their experience, rather than their accomplishments and knowledge within their sport, who feel connected to their teammates are more likely to be physically active in college. However, the likelihood that they will adhere to those physical activity behaviors decreases as temporal distance increases, putting them at risk for developing sedentary behaviors in adulthood.

### **Limitations and Future Research**

Despite the strengths and findings of this research, limitations do exist. The population of the participants creates some fragility in the generalizability of the findings. Because all participants were recruited from the same high school, a small, college preparatory school that competes in lower division interscholastic sports, the results of this study may be more specific to the culture of this community. Additionally, the size of the sample ( $N=37$ ) and demographic make-up (predominant ethnicity of white and gender of female) make it difficult to apply these results to the general population. While the current research design did not have any questions specifically related to gender or ethnicity, future research should expand the diversity of the sampled population in order to gather results that can be generalized to a wider variety of communities. Additionally, a few of the scales used in this research had a Cronbach's alpha that was lower than the standard criteria of 0.70 (competence 0.67, autonomy 0.62). Future studies should consider the strength of reliability of these scales when measuring these variables.

Perhaps the greatest limitation to this study design is the cross-sectional data; this research cannot account for additional factors outside of sport experience that may influence intention. Moreover, all variables were measured at the same time point and thus it was not possible to test the causal sequence proposed by SDT and TPB. Studies replicating the current model with more longitudinal data will be important to further explore the relationship between the variables examined in this study. While the current research showed that intention decreased as temporal distance increased, one of the shortcomings of this research is that the future behaviors were not measured. Future

longitudinal research should look to study participant physical activity behaviors over time to see if this decrease in intention holds true.

### **Applications**

The results of this study are most directly applicable to high school coaches and athletic administrators. When working with student-athletes, it is important to maintain a “bigger picture” perspective of the purpose of youth sport participation. While the accolades and accomplishments in sport can be empowering, the current research shows that the experience an athlete has with their teammates holds more weight than the accomplishments and skillsets they acquire through sport participation. While it may be important for athletes to feel competent and autonomous in their sport, in order for their sport experience to have a lasting impact, athletes need to feel connected with their peers. To ensure that healthy, physically active high school athletes continue to adhere to exercise after high school graduation, coaches and athletic administrators need to place a strong emphasis on creating a sport culture that builds intrinsic motivation by emphasizing relationship building and connection. While competition and improvement of individual and team skillsets is important in competitive sport, coaches need to find a balance that allows for practices to be challenging without compromising enjoyment. This can be achieved by lacing in practice drills that focus more on fun as a way to break the monotony of competition-based drills. Relationship building can be emphasized by prioritizing team dinners and smaller bonding opportunities, or looking for larger opportunities like competing in a tournament that allows the team to travel together.

Regardless of the drills and experiences that coaches implement throughout a season, the overall culture of a high school athletic program needs to prioritize relationship building, teamwork, and making sport an enjoyable experience in order to positive influence their long-term well-being.

## Appendix

## High School Sport Survey

## What I Am Like

Really True for Me	Sort of True for Me	Sample Items:		Sort of True for Me	Really True for Me	
<input type="checkbox"/>	<input type="checkbox"/>	Some people like chocolate ice cream the best	<b>BUT</b>	Other people like vanilla ice cream the best.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Some people like dogs better than cats	<b>BUT</b>	Other people like cats better than dogs.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Some people do very well at their sport	<b>BUT</b>	Other people don't feel that they are very good when it comes to their sport.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Some people think they could do well at just about any sport skill	<b>BUT</b>	Other people are afraid they might not do well at sport skills.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that they are better than others their age at sport	<b>BUT</b>	Other people don't feel they can play their sport as well as others their age.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Some people don't do well at new sport skills	<b>BUT</b>	Other people are good at new sport skills right away.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Some people wish they could be a lot better at their sport	<b>BUT</b>	Other people feel they are good enough at their sport	<input type="checkbox"/>	<input type="checkbox"/>

### On My Team

Athletes differ in how much choice they feel they have when it comes to their sport and how connected they feel with their teammates and coaches. **Think about how true each statement is for you in your current sport. Circle your response.**

1. I have a say in what I do when participating in my sport.

Not at all true for me    Not true for me    Sort of true    True for me    Completely true for me

2. I get along with my teammates.

Not at all true for me    Not true for me    Sort of true    True for me    Completely true for me

3. I feel forced to do things in my sport, even when I don't really want to do them.

Not at all true for me    Not true for me    Sort of true    True for me    Completely true for me

4. I get along with my coaches.

Not at all true for me    Not true for me    Sort of true    True for me    Completely true for me

5. My teammates are generally pretty friendly towards me.

Not at all true for me    Not true for me    Sort of true    True for me    Completely true for me

6. I help decide what I do when participating in my sport.

Not at all true for me    Not true for me    Sort of true    True for me    Completely true for me

7. I really like my coaches.

Not at all true for me    Not true for me    Sort of true    True for me    Completely true for me

8. I consider my teammates to be my friends.

Not at all true for me    Not true for me    Sort of true    True for me    Completely true for me

9. I get to do the things I want to do when participating in my sport.

Not at all true for me    Not true for me    Sort of true    True for me    Completely true for me



6. My coach tries to understand how I see things before suggesting a new way to do things.

Strongly Disagree				Neutral			Strongly Agree
1	2	3	4	5	6	7	

### Why Do You Practice Your Sport?

Please indicate to what extent each of the following items corresponds to one of the reasons for which you are currently practicing your sport.

1. For the pleasure it gives me to know more about the sport that I practice.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.

Does not correspond at all	Corresponds a little	Corresponds moderately	Corresponds a lot	Corresponds exactly
1	2	3	4	5

WHY DO YOU PRACTICE YOUR SPORT ?

2. For the pleasure of discovering new training techniques.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.

Does not correspond at all	Corresponds a little	Corresponds moderately	Corresponds a lot	Corresponds exactly
1	2	3	4	5

WHY DO YOU PRACTICE YOUR SPORT ?

3. For the pleasure that I feel while learning training techniques that I never would have tried before.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.

Does not correspond at all	Corresponds a little	Corresponds moderately	Corresponds a lot	Corresponds exactly
1	2	3	4	5

WHY DO YOU PRACTICE YOUR SPORT ?

4. For the pleasure of discovering new performance strategies.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.

Does not correspond at all	Corresponds a little	Corresponds moderately	Corresponds a lot	Corresponds exactly
1	2	3	4	5

WHY DO YOU PRACTICE YOUR SPORT ?

5. Because I feel a lot of personal satisfaction while mastering certain difficult training techniques.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.



WHY DO YOU PRACTICE YOUR SPORT ?

---

6. For the pleasure I feel while improving some of my weak points.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.



WHY DO YOU PRACTICE YOUR SPORT ?

---

7. For the satisfaction I experience while I am perfecting my abilities.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.



WHY DO YOU PRACTICE YOUR SPORT ?

---

8. For the pleasure that I feel while executing certain difficult movements.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.



WHY DO YOU PRACTICE YOUR SPORT ?

---

9. For the pleasure I feel in living exciting experiences.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.



WHY DO YOU PRACTICE YOUR SPORT ?

---

10. For the excitement I feel when I am really involved in the activity.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.



WHY DO YOU PRACTICE YOUR SPORT ?

---

11. For the intense emotions I feel doing a sport that I like.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.



WHY DO YOU PRACTICE YOUR SPORT ?

---

12. Because I like the feeling of being totally immersed in the activity.

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.

Does not correspond at all	Corresponds a little	Corresponds moderately	Corresponds a lot	Corresponds exactly		
1	2	3	4	5	6	7

WHY DO YOU PRACTICE YOUR SPORT ?

---

### What's Next?

These questionnaires are related to your physical activity plans after high school. We would like to know more about your exercise plans once you finish high school and are no longer competing on your high school sports team.

1. I intend to exercise throughout my first year of college for at least 30 minutes per day, 5 days a week.

Strongly Disagree	Neutral					
Strongly Agree						
1	2	3	4	5	6	7

2. I intend to exercise throughout college for at least 30 minutes per day, 5 days a week.

Strongly Disagree	Neutral					
Strongly Agree						
1	2	3	4	5	6	7

3. I intend to exercise after college for at least 30 minutes per day, 5 days a week.

Strongly Disagree	Neutral					
Strongly Agree						
1	2	3	4	5	6	7

4. I intend to exercise for the rest of my life for at least 30 minutes per day, 5 days a week.

Strongly Disagree	Neutral					
Strongly Agree						
1	2	3	4	5	6	7

### All About You

1. How old are you?
- 14
  - 15
  - 16
  - 17
  - 18

2. What is your gender?
  - a. Male
  - b. Female
  
3. What grade are you in?
  - a. 9<sup>th</sup>
  - b. 10<sup>th</sup>
  - c. 11<sup>th</sup>
  - d. 12<sup>th</sup>
  
4. How do you describe your race or ethnicity? (please circle all that apply)
  - a. Asian/Pacific Islander
  - b. Black or African American
  - c. Hispanic or Latino
  - d. Native American or American Indian
  - e. White
  
5. What sport are you currently playing for your school?
  - a. Baseball
  - b. Basketball
  - c. Golf
  - d. Soccer
  - e. Swimming
  - f. Tennis
  - g. Track & Field
  - h. Volleyball
  - i. Other (please indicate): \_\_\_\_\_
  
6. How many high school seasons of sport have you completed for your current sport (not including this season)?
  - a. One
  - b. Two
  - c. Three
  - d. This is my first year playing
  
7. Do you plan on going to college?
  - a. Yes
  - b. No

8. Have you verbally committed to playing a sport in college?
  - a. Yes
  - b. No
  
9. Have you signed a national letter of intent to play a sport in college?
  - a. Yes
  - b. No

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