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# High School Sport Participation: Effects on Students' Grit and Resilience

Rory Kekoa-Israel Waldman

A dissertation submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Paul Caldarella, Chair
Ross A. A. Larson
Jared S. Warren
Melissa A. Heath

Department of Counseling Psychology and Special Education

Brigham Young University

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ABSTRACT

High School Sport Participation: Effects on Students' Grit and Resilience

Rory Kekoa-Israel Waldman
Department of Counseling Psychology and Special Education, BYU
Doctor of Philosophy

Adolescence is a time of transition, growth, and identity exploration. Often this great time for growth is accompanied with an increase in stressors that can be detrimental to success and health, without the necessary coping mechanisms. It is a period of life where resilience and grit are extremely important. A post-traumatic growth definition for resilience allows for the possibility of a steeling effect, in which the resilience of an adolescent can grow and develop. Sport provides an ideal environment for the development of both grit and resilience by providing a safe environment for adversity to occur without detrimental consequences. In a previous study done by Caldarella et al. (2019, they explored sport and its effect on resilience in adolescents. However, this previous study only used a parent report. The current quasi-replication aimed to compare high school athletes and non-athletes and their levels of grit and resilience using an online self-report and parent report method with the Grit scale and SEARS measurement. I found that athletes who participate in three or more sports have higher levels of perceived resilience ($p$ = .017. For future studies I recommend a larger sample size as well as examining how other extracurricular activities may impact grit and resilience.

*Keywords*: resilience, grit, adolescent, sport, high school

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TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

# CHAPTER 1

## Introduction

The adolescent years are a time filled with turmoil and transition. The body and mind go through major changes that effect the psyche of every teenager (Martin & Steinbeck, 2017). Waid and Uhrich (2019) found that increases in stressors and a lack of healthy coping mechanisms make for an increase in risk taking behavior during adolescence. They go on to explain that the increase in risk taking is correlated with an increase in mental health difficulties. While the risk-taking behaviors in of themselves might signal a period of growth and maturation, when coupled with improper coping mechanisms, they can be detrimental to the health and success of youth. Along with the typical stressors and risk factors adolescents experience, the onset of the COVID-19 pandemic and the accompanying protocols set in place by various school and governmental organizations resulted in increased cases of mental health disorders (Liang et al., 2020).

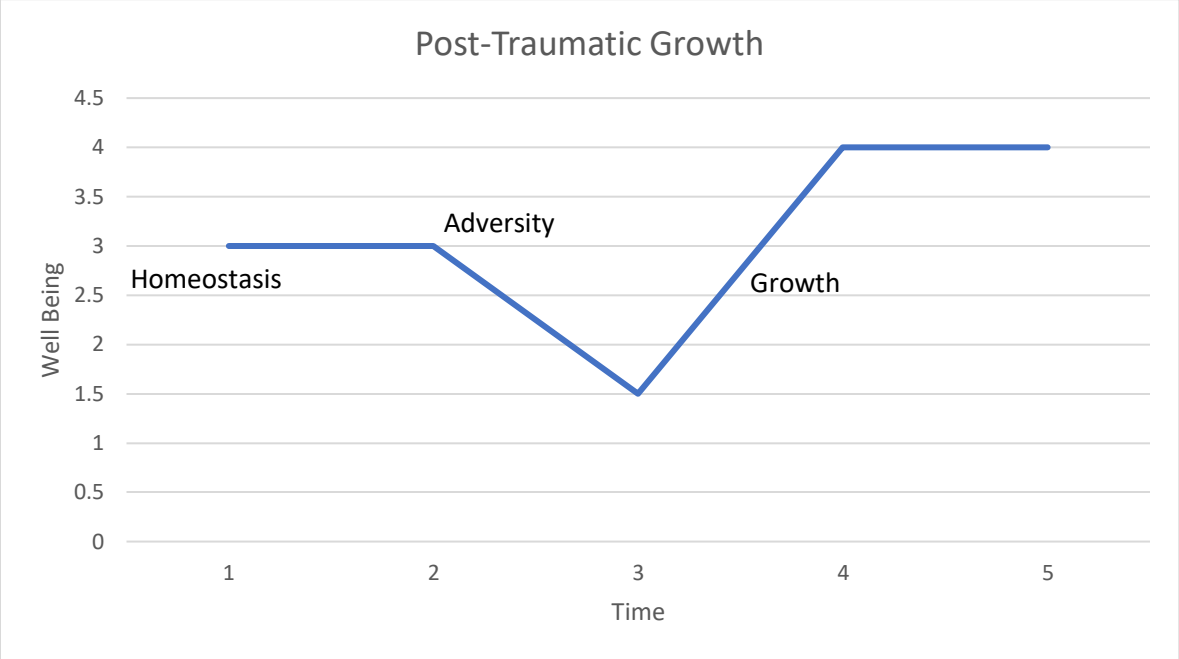
If adolescence stress is inevitable, how can we help youth get through this difficult period successfully, without making too many detrimental decisions? A prominent and relevant research area in this regard is grit. Specifically, how grit can help youth become more successful in student transition to and through high school. Angela Duckworth and colleagues (2007) defined grit as passion and perseverance for long term goals. Grit is a key factor in coping with mental health pressures and is an important concept to study, to better understand and improve at risk students' chances of educational success and personal well-being (Stoffel & Cain, 2018). However, grit is only applicable to difficult well-defined tasks (Credé et al., 2017). The issue this presents is that life is often not well defined. There is no one solution that will get everyone from

point A to point B. So, grit alone cannot be the answer to help youth. Resilience may provide the answer.

Resilience is an intangible construct that we assign meaning to. In other words, it is an abstraction used to describe something. As a result, there are many definitions and models that are used to operationalize and describe resilience. This can make it difficult to narrow down and measure resilience. The current research study used the post-traumatic growth definition of resilience put forward by Wong and Wong (2013). Namely, that when adversity comes and is overcome the individual grows stronger than before the adversity. To illustrate post-traumatic resilience, I will use the following example: a person is at homeostasis. Adversity is introduced to the individual. If the individual has the resources to handle the adversity it would not build resilience and would likely not be considered adversity. If the individual does not have the necessary resources to overcome the adversity, it creates an opportunity for growth. The individual will dip down below homeostasis. The individual must then learn new ways to solve the problem. Once the adversity is overcome the individual continues at a new homeostasis, that is higher and on a different plane than where they started. This definition of resilience allows for growth and development.

**Figure 1**

*Illustration of Post-Traumatic Growth*




For such proper growth and development to occur we need the correct environment that allows for possible positive outcomes (Wong & Wong, 2013) and the cultivation of the following constructs: positive emotion, engagement, healthy relationships, meaning, and accomplishment (Seligman, 2010).

Grit and resilience are closely related yet different. Necessary for grit are two components: passions and perseverance (Duckworth et al., 2007). Duckworth explains that her grit scale measures passion over a long time and perseverance which she claims to be a measure of resilience. Resilience most commonly refers to the ability to adapt positively in the face of adversity. Resilience is a part of grit but only half of the equation whereas grit does not have to be present in resilience (Perkins-Gough, 2013).

Sport has the unique ability to offer an individual a safe place where adversity can occur, and character can be tested. It is the perfect environment to study how individuals operate and make decisions in highly demanding circumstances (Sarkar & Fletcher, 2014). Adversity is inherent in sport, there is possibility for positive outcome, and in most cases the individuals have a belief that positive outcome is attainable. It is a natural lab for which to develop resilience. However, it may be difficult to parse out what came first. Do resilient individuals tend to play sports or does sport impact resilience.

In a study by Caldarella et al. (2019), researchers measured youth sport participation and resilience using a parent report. While this is an effective way to measure resilience, using both a self-report as well as a parent report will produce more accurate results. Furthermore, this prior study did not examine grit. The current quasi-replication study expanded the current literature by exploring the relationship that resilience and grit have with sport participation, using both parent and student reports.

**Study Purpose**

While prior studies have explored how sport has influenced resilience in high school students by either self-report (Şahin, 2013) or parent report (Caldarella et al., 2019) they have not combined the two (self-report and parent report) to triangulate and get a more complete picture of high school students. Previous studies have also explored grit, but they have not explored the relationship between grit and resilience. The current study explored both self-report and parent report as they relate to sport and its relationship with resilience and grit as well as explored the relation between grit and resilience.

## Research Questions

The specific research questions for this study are as follows:

1. Do adolescents who participate in sports have higher levels of resilience than those who do not?
2. Do adolescents who participate in sports have higher levels of grit than those who do not?
3. Is there a correlation between grit and resilience?
4. Do adolescents who participate in more than one sport have higher levels of resilience than those who only participate in one sport?
5. Do adolescents who participate in more than one sport have higher levels of grit than those who only participate in one sport?
6. Do parents and students agree regarding the potential effects of sport on resilience and grit?
7. A supplemental question examined whether the COVID-19 pandemic affected students' sport participation.

# CHAPTER 2

## Literature Review

### High School

Adolescents often have a difficult time making the transition from middle school to high school, with this time period being met with both great excitement and great concern for the adolescent (Mizelle & Irvin, 2000). The average adolescent faces a multitude of stressors that include but are not limited to physical development, becoming more autonomous, and the development of romantic relationships (Gelhaar et al., 2007). Adolescence is also a time marked by amplified sensitivity to the environment (Steinberg, 2014). In other words, the environment plays a large role in molding the identity of the adolescent. This transition can be accompanied by an increase in perceived stressors and an inability to cope with those stressors (Lin & Yusoff, 2013). In addition to the systematic stressors that adolescents face because of the transition into high school they also must cope with the onset of puberty, which brings with it biological changes as well as changes in hormones that can be difficult to adjust to (Martin & Steinbeck, 2017).

Social pressures also increase as a result of identity exploration throughout the adolescent years. It becomes a time to branch out and away from one's parents to figure out who they are and who they want to be. To become more autonomous adolescents often experience the world in a way they never have and create their own opinions. What the adolescent perceives as social norms often becomes the norm for the adolescent (Choukas-Bradley et al., 2014). In other words, what the adolescent perceives, even if they may be false perceptions, becomes the norm. For example, if the adolescent perceives that many of their peers are drinking alcohol, drinking alcohol becomes the norm in this adolescent's mind, even if this perception is false. These

perceived social norms can lead individuals to engage in risky behavior such as drug use and early risky sexual behavior. Seeking the approval of peers becomes a key component in identity. However, when that peer approval does not come, resulting in rejection, it can lead to further isolation and depression (Wentzel, 1999). The negative effects of peer pressure or rejection can increase the student dropout rate, which is 16% in the United States, according to the National Center for Education Statistics (2020). According to a study of high school dropouts, 42% said they dropped out because they spent time with others who were not interested in school (Bridgeland et al., 2006). Dropping out is also affected by the extent to which adolescents can cope with a variety of risk factors in their lives.

**Risk Factors**

While this period of growth and transition known as adolescence is par for the course, it is also fraught with many inherent risks. Adolescents' brains are actively changing and evolving (Paus et al., 2008). Specifically, the regions of the brain responsible for attention, reward evaluation, response inhibition, and goal-directed behavior, go through a structural and functional reorganization that is in part responsible for the range in cognitive and affective behavior throughout adolescence (Yurgelun-Todd, 2007). The changing brain structure in addition to novel environmental stimuli creates a vulnerability to mental health difficulties (Blakemore & Mills, 2014). Adolescence is a time of self-discovery where individuals experiment with and find their identities. This transition period of self-discovery creates a very difficult environment for adolescents, which can cause major mental distress. Suicide is the 2nd leading cause for death in high school students in the United States and is a growing concern. According to the National Alliance on Mental Health (2019), 20% of high schoolers experience suicide ideation and 9% report a suicide attempt. In a study by Andersen and Teicher (2008) they

found that approximately 60% of the variance in risk related to suicide was attributed to the environment. This has implications for the types of environments that are designed for adolescents and the effects they may have.

Adolescence is also a period of increased risk taking. Risk taking increases due to novelty seeking. The novelty of a stimulus can elicit a release of neurochemicals that are synonymous with pleasure. Waid and Uhrich (2019) found that adolescence marked a significant increase in risk-taking behaviors, namely substance abuse, risky sexual activity, and violent behavior. They also found that prolonged risk taking was associated with increased mental health difficulties. While the risk-taking behavior in of itself might signal a period of growth and maturation, it can be detrimental to the health and success of youth.

Poverty is a risk factor that has been defined and described many ways. In the United States poverty is a federal term meaning an individual is below an income threshold of $33,148. However, it should be noted that there can be other determinants for poverty such as social exclusion, lack of basic needs, and marginalization (Dashiff et al., 2009). Dashiff et al. (2009) explained that poverty may have detrimental effects on adolescent mental health. Difference in income, namely poverty, has also been linked to adolescents internalizing behavioral problems (Anderson et al., 2014).

Divorce is another risk factor that has a major impact on adolescents. Adolescents who experience parental divorce are 10% more likely to engage in alcohol consumption, binge drinking, tobacco use, and marijuana use (Gustavsen et al., 2016). Størksen and colleagues (2006) found that adolescents who experienced a parental divorce experienced more psychological distress than their peers who had not, 30% compared to 15%. Divorce can also

impact adolescents by leading to a decrease in educational performance (Fagan & Churchill, 2012).

Current day affairs and events have also created a new risk factor that has greatly affected youth and adolescents; COVID-19. The COVID-19 virus hit global news in late December 2019 with reports coming out of China referring to a new viral pneumonia. By late January 2020, the new coronavirus was declared a public health emergency of international concern (World Health Organization; WHO**,** 2020**)** Since then, complete cities and countries shutdown with the hopes of stopping the spread of the virus. As of October 2020, the range for daily new cases was 200,000 to 300,000 around the world (WHO**,** 2020**)** and there were 6,916,292 cases in the United States (Centers for Disease Control; CDC, 2020). COVID-19 had a drastic effect on American society with workplaces down 34%, and stay at home laws extended to almost 30% of the country (CDC). School closures began across the country in March of 2020.

COVID-19's reach and effect go beyond illness and economic downturn; it also greatly affected the mental health of adolescents. In a study by Liang et al. (2020) they sampled 584 people ranging from 14 to 34 and found that two weeks after the pandemic hit 40.4% presented with psychological problems and 14.4% of the youth group presented with symptoms like PTSD. The impact of social distancing and school closures had a negative impact on children and adolescents psychological make up, namely increased levels of anxiety and depression (Duan et al., 2020)

**Grit**

Over the past two decades there has been a surge in grit research. One of the lead researchers on Grit has defined it as passion and perseverance for long term goals (Duckworth et al., 2007). It has also been defined as a passionate commitment to a single mission and an

unwavering resolve to achieve that mission (Gamel, 2014). Further, it is the ability to persevere through hardship and adversity to achieve a goal (Arouty, 2015). All these definitions have something in common; they define grit as a drive to achieve. Grit is directional in that individuals who possess it strive to achieve something specific.

Grit is an intangible trait that allows those who possess it to achieve and succeed in their goals. It is a character trait that predicts life satisfaction and high achievement (Gamel, 2014). Grit is a key factor in coping with mental health pressures and is an important concept to study to better understand and improve at-risk students' chances of educational success and personal wellbeing (Stoffel & Cain, 2018). S. Wang et al. (2018) showed that grit is strongly correlated with the dorsomedial prefrontal cortex. This area of the brain is known to be correlated with self-regulation, planning, goal setting, and counterfactual self-reflection. Those who have high levels of grit can set and plan goals and reflect on their failures and learn from them more efficiently than those who do not. This could help explain how those with high levels of grit are able to persevere through challenges over time. Most importantly, grit is malleable (Alan et al., 2019). Since grit is a key factor in coping with mental health and is malleable (can be increased or decreased), it is important to understand how it can be developed and the environments that could increase it.

Park et al. (2018) explored how the academic environment impacts grit score. Park found that if the school and teachers emphasized mastery over outcomes the students took on this same belief pattern and focused on mastery rather than outcomes. This enabled the grit scores of the students to increase rather than stay the same. However, grit has limitations. According to research, grit is more relevant to achieving some goals versus others (Duckworth et al., 2007). For example, grit is helpful in difficult well-defined tasks (school-related problems like tests and

homework), but less helpful in easy or ill-defined tasks, such as navigating the social scene of high school (Credé et al., 2017). One of the strengths of Grit is also its weakness. Namely, that it works well for defined tasks but falls short on ill-defined tasks. The problem with this is that life is often ill-defined and does not have a straightforward path. There is no simple solution that works for everyone. Life and people in general are complex, namely there is no one solution that works for everyone.

Resilience may be the answer for the ill-defined tasks. Resilience may be able to fill in where grit cannot. If grit cannot help people with ill-defined tasks, perhaps resilience can. Important in this conversation is the question of what ill-defined tasks are. The easy answer is life in general. More specifically in relation to adolescents it is the transitions from junior high to high school, and high school to something greater. More importantly ill-defined tasks might be, finding an identity and being secure in that identity.

**Resilience**

Individuals have been researching resilience for several decades. To gain a better understanding of the current framework for resilience it is important to understand its' history. Originally, research around resilience focused on the invulnerable child, or the child who found success despite large amounts of adversity (Wong & Wong, 2013). Masten (2001) suggested that resilience was the result of normative adaptive behavior seen in children, and there was not a special quality found in just a few children. She went on to say that this idea of special qualities most likely got its start from the deficit models of psychopathology. Masten's research suggests that everyone possesses within themselves the capability for resilience, it is a normative adaptation. Researchers then transitioned to contextual research and the process of adaptation through adverse circumstances, or how an individual can continue to carry on through adverse

experiences. Studies found that children who had the resources to face adversity had positive outcomes compared to those who did not have adequate resources (see e.g., Masten & Coatsworth, 1998; Masten et al., 1999). This trend manifested itself in the development of various models that strived to explain resilience. In the development of these models, researchers tried to explain how resilience was developed or what was needed for resilience to develop. For example, Gillespie and colleagues (2007) explained resilience using a five-construct model consisting of hope, self-efficacy, coping, culture, and age. One of the more prominent models developed by Seligman (2010) used five different constructs to explain resilience: positive emotion, engagement, relationships, meaning, and accomplishment. In other words, in order to develop resilience these elements must be cultivated. Merrell (2011) found resilience to consist of adaptive behaviors related to self-regulation, social competence, empathy, and responsibility. The American Psychological Association defines resilience as the process and outcome of adapting well in the face of difficult or challenging life events (American Psychological Association; APA, 2022**).** No matter the differences in definitions they incorporate some sort of adversity and one's ability to overcome stated adversity. One of the reasons for many different models that explain resilience is the multiple operational definitions of the trait. Further, Southwick et al. (2014) explained that because someone shows resilience in one area of their life does not mean it will translate to another area of their life. For example, if an individual shows indication of resilience in the workplace when faced with adversity does not mean they will show equal levels of resilience in their relationship struggles. The different environmental stimuli and situations can alter and impact resilience.

Resilience may not be a singular construct, but rather the accumulation of multiple. Seligman (2010) explained that resilience is made up of positive emotion, engagement, healthy

relationships, meaning, and accomplishment. Alvord and Grados (2005) stated that resilience is made up of six constructs: proactive orientation, self-regulation, proactive parenting, connections and attachments, achievement, and community. McCubbin (2001) questioned whether these constructs made up resilience or if they were just merely protective factors. Perhaps these constructs or protective factors are the resources researchers have discussed in terms of ability to overcome adversity (Masten & Coatsworth, 1998; Masten et al., 1999). Recalling Figure 1, these constructs and or protective factors are what allow for the ability to overcome adversity and begin the growth process. Thus, when describing, defining, and measuring resilience it would make sense to measure the resource.

Like the issue of defining resilience, measuring it becomes even more complex. There are many different scales of resilience and each one uses different constructs to define resilience. This becomes problematic because with no standard it becomes difficult to compare studies and have a baseline. What one measure of resilience claims as being resilient or having a high resiliency score, another may say something different. While the APA provides a definition for resilience is it does not provide a way to measure it. Resilience is an abstraction that we use to describe the phenomena of overcoming adversity, which lends itself to difficulty in measuring. How does one measure something that is not tangible? This is the crux of the issue with resilience measures. Each individual researcher or research team uses different constructs or abstractions to model what resilience is. One measure may use emotional intelligence and responsibility while another may use grit, hardiness, and social competence and both will say they measure resilience. Is resilience a combination of emotional intelligence and responsibility or grit, hardiness, and social competence, because they are vastly different.

Resilience is a complex concept that when asked about its definition one would get multiple answers. Part of this stems from fact that resilience is often viewed as multiple constructs such as a trait, a process, or an outcome (Southwick et al., 2014). While explained similarly, these three constructs are qualitatively different and have differing operationalized definitions. Martinek and Hellison (1997) defined resilience as the ability to bounce back successfully despite exposure to adversity. Herrman et al. (2011) referred to resilience as the positive adaptation or the ability to maintain or regain mental health. Developmental psychology defined it as a process or capacity for successful adaptation despite challenges (Windle, 2011). However, inherent in these definitions is the absence of growth. When talking about bouncing back, maintaining, or regaining we are saying that an individual was at point A and may have dipped down to point B, but they were able to come back up to point A. In these definitions there is no mention of the growth that can occur after adversity.

Resilience has evolved into something more than the Newtonian bounce back definition of resilience. Resilience means more than bouncing back, it means to persevere through hardship and come out stronger for having done so. Greitens (2015) explained that by using these definitions we are misunderstanding our human capacity to change and improve. Rather than bouncing back from hardship and adversity to be the same person you were beforehand, resilient people find healthy ways to integrate the experience of adversity and hardship into their lives. This new definition of resilience allows for growth on the part of the individual, but more importantly it allows for resilience itself to grow.

If resilience can be developed and trained, how is it done? Wong and Wong (2013) explained that there are two necessary conditions for resilience to manifest itself: adversity and possibility for a positive outcome. If one of these components is missing, resilience does not

develop. If for any given situation there is adversity but no positive possible outcome the result is learned helplessness and giving up. If the components are switched and there is no adversity, then there can be no resilience because growth does not occur as result having nothing to overcome. Wong and Wong (2013) further explained that the more experience you have in overcoming adversities the more resilient you will be. In other words, resilience works like a muscle. The more you use it the stronger it becomes; this is also known as the *steeling* effect. Martinek and Hellison (1997) noted that autonomy is a major factor in resilience, or an individual's ability to exert control over the environment and overcome. Inherent in this explanation is the notion of self-efficacy. The individual not only needs to believe there is the possibility for a positive outcome but that their ability is enough, that they can reach that positive outcome. This could help to explain why some individuals exhibit high levels of resilience and others low. Resilience can be developed in individuals if they are provided with adverse experience, the possibility for a positive outcome, and they believe they have the capability to achieve that positive outcome. Sport may provide a venue in which both resilience and grit can develop.

**Grit and Sport**

Grit has been conceptualized as passion and perseverance toward achieving a specific goal. Gritty individuals have been characterized as people who progress toward their goals regardless of failures, obstacles, and periods of plateau (Duckworth et al., 2007). One might assume then that elite level athletes who train for years and sacrifice much would have high levels of grit. In a review of grit and sports Cormier et al. (2021) examined studies which compared competitive level and grit and found that athletes intending to carry on in their sport to elite levels had higher levels of grit than their recreational counterpart. Further, Cormier et al.

found that elite athletes had higher levels of grit than non-athletes. Nothnagle and Knoester (2022) found that participation in sports throughout childhood and into adulthood, regardless of level, resulted in higher levels of grit on average than those who did not. However, they also found that when individuals dropped out of sport, it created a decrease in grit in adulthood. This may suggest that sport itself is not the significant variable for the development of grit, but rather the act of sticking with something over a long period of time, regardless of what it is (Nothnagle & Knoester, 2022).

**Resilience and Sport**

Resilience has been conceptualized as the trait or process of overcoming and or adapting to adversity, trauma, or tragedy. Adversity and the prospect of failure are inherent in sports when they are played competitively. In fact, if an individual were to fail more than they succeed they could still be considered highly successful in sport. In baseball elite major league baseball players are only successful at hitting the ball into play 30% of the time (Baseball Reference, 2020) and 30% is considered elite. In football, teams have made the playoffs with losing records (Pro-Football Reference, 2020). For the mind of the athlete, failure becomes the norm, and they make mental adjustments to allow them to thrive. To be successful an athlete must adapt to the adversity they face, the very definition of resilience.

Sport has the unique ability to offer an individual a safe place where adversity can flourish, and character can be tested. It is the perfect environment to study how individuals operate and make decisions in highly demanding circumstances (Sarkar & Fletcher, 2014). Adversity is inherent in sport, there is possibility for positive outcome, and in most cases the individuals have a belief that a positive outcome is attainable. It is a natural lab for which to develop resilience.

Hosseini and Besharat (2010) explained that sport affects mental health by building resilience. In their study they found that there was a positive correlation between resilience and sport achievement, and between resilience and psychological well-being. Sport provides an area where protective factors can be developed (Hall, 2011). In a study done in various countries in Africa researchers found that soccer improved the decision-making strategies of the participants (Peacock-Villada et al., 2007). Johnson et al. (2014) noted that sport builds resilience and, as a result, risky behaviors such as unprotected sex, substance abuse, and violent acts were all observed at significantly lower rates than that of non-athletes. Research has also suggested that sport provides opportunity for life skills to be taught both explicitly and implicitly (Chinkov & Holt, 2016). In another study, vulnerable youth who participated in sport had better pathways for educational success (Peck et al., 2008). Participation in sports appears to have a positive effect on adolescents. The next logical question is, how may sport build resilience?

Resilience may be built and developed in sport as the athletes apply various mental skills or qualities to overcome adversity and stressors they encounter (Fletcher & Sarkar, 2016). These various skills can be learned both implicitly, from experience, and explicitly as they are taught to athletes. The coping responses are a result of the emotional responses the athletes have towards failure (Poczwardowski & Conroy, 2002). Thus, theoretically an athlete who has either implicitly or explicitly learned mental skills because of sport, and failure within sport, are likely to have positive emotional responses toward failure and adversity outside of sport.

Sarkar and Fletcher (2014) explained that there are essentially three different types of stressors that athletes face: competitive, organizational, and personal. Competitive stress relates to the innate stress that athletes face because of the sport (i.e., opponents). Organizational stress refers to the stress that athletes may face because of the organization they are a part of (i.e.,

teams, coaches, or managers). Personal stress refers to the stress athletes might face outside of sport all together (i.e., relationship issues). The result of the presence of these stressors on an athlete is the ability to cope with and find solutions to problems and adapt to adversity. Blanco-García et al. (2021) found that type of sport and completive level of the sport did not lead to higher levels of resilience. Meaning, no matter the level of competition or type of sport, individuals who participate in sports benefit from them in terms of resilience. According to Wong and Wong (2013) adversity may also depend on the appraisal of danger and or threat. This is important to know and remember because the skill of the athlete may inform the coping response and the emotional response as a result of stressors. In other words, a skilled athlete may not have need for the same coping mechanisms a less skilled athlete, as it relates to competitive stressors because they may not appraise the competition to be a threat.

The environment and how individuals interact with their environment can also play a large role in the development of resilience in sport. Martinek and Hellison (1997) found that autonomy was a key factor in developing resilience: The ability of the individual or athlete to exert control over their environment preceded the development of resilience. If there is no sense of control on the part of the individual, they cannot build resilience because they would not be learning and progressing as a result of a lack of autonomy. They go on to explain that the ability of youth to interact socially is also a strong factor that influences resilience. Those with an ability to interact in a healthy manner were found to have higher levels of resilience. Taking these two findings into account would mean that the social environment needs to be a good fit and allow for a certain amount of control for the individual to develop resilience.

In relation to sport, the antithesis of resilience is burnout, resulting in dropout. Having a negative motivational climate or environment, fostered by the team or organization, can play an

important role in burnout and drop out. For example, Vitali et al. (2015) found that a mastery environment (task-oriented) utilized by coaches created a protective factor (resilience) against burnout. This suggests that an organization or coach role is monumental in the development of resilience through sport. One could make an argument that a tough, hardnosed coach could create the adversity needed for resilience to be developed. However, the inherent difficulty within sport may create enough adversity for resilience to be needed and developed. When an extra stressor, such as a hardnosed coach, is added to the equation there may be a greater chance of burnout and quitting, which would negate the benefits of sport. Furthermore, the lesson of quitting when things become difficult would be maladaptive to adolescent success. For example, Gearity and Murray (2011) found that poor coaches elicited five themes in their athletes: poor teaching, uncaring, unfairness, and inhibiting athletes' mental skill, and athletes' coping. These researchers explained that poor coaches created self-doubt in the athletes which resulted in low levels of motivation. The athletes became afraid to fail. Thus, rather than fail they did not even try. This can result in burnout, which as stated above is the antithesis of resilience in sport.

**Resilience and Sport in High School**

Resilience learned via sport can translate to high school academics. A study conducted by Braddock and colleagues (1991) with male African American high school students, found that sports had a positive correlation with academic achievement. In other words, the skills that were learned as a result of playing sports had a positive impact in their schooling. A study was done in Turkey by Şahin (2013) that measured resilience levels in high school athletes compared to high school non-athletes and found that athletes had higher levels of resilience than the non-athletes. Caldarella and colleagues (2019) also found that adolescents who participated in sports had higher levels of resilience than those who did not, as reported by parents. In a longitudinal study

done in Iowa on resilience, Conger and Conger (2004) measured resilience levels in seventh graders and examined major transition periods. They found that the participants who had higher levels of resilience were able to cope better during the transition from adolescence to adulthood. This is not to say that resilience is a magical substance that allows for individuals to be invulnerable. Rather, individuals with higher levels of resilience are better able to cope and adapt when adversity comes, which it surely will. These studies provide evidence that sport can be an avenue for resilience development, to further enhance the likelihood of success for youth.

# CHAPTER 3

## Method

### Setting

I surveyed high school students from a school in Utah County with a diverse student body to allow for greater generalization (see Table 1). I included a high school with numerous sports to examine.

**Table 1**

*School Demographics* (*N* = 1,971)

| Demographic | Percentage |
|---|---|
| Ethnicity | |
| White | 91.0 |
| Hispanic/Latino | 38.5 |
| Pacific Islander | 5.4 |
| Asian | 2.4 |
| African American | 2.3 |
| American Indian | 2.3 |
| Gender | |
| Female | 49 |
| Male | 51 |

*Note.* Ethnicity percentages do not total 100 since some students are multi-ethnic.

### Participants

Participants consisted of non-athletes as well as athletes. I aimed to survey a minimum of 300 parent-student pairings, based on the Caldarella et al. (2019) study in which they used 276 parents but no students. The goal was to obtain as diverse a sample as possible in terms of gender, ethnicity, age, and sport. By having more of a diverse sample, results would be more generalizable. The sample of non-athlete students would also need to resemble the sample of

athletes, to avoid any bias and validity and or reliability issues. To obtain participants I used a convenience sampling method via volunteering, with an incentive in place for participants consisting of a random drawing of 10 Amazon gift cards each in the amount of $50.00 for both parent and student participants. Each parent completed a Qualtrics survey for their child. Students also completed a Qualtrics survey for themselves. This helped triangulate the grit and resilience scores and further validate the responses. Demographic data for the study participants are found in Table 2 (students) and 3 (parents) below.

**Table 2**

*Demographics of Participating Students (N = 74)*

| Demographic | Percentage |
|---|---|
| Ethnicity | |
| White | 62.7 |
| Hispanic | 14.7 |
| Asian | 6.7 |
| Pacific Islander | 2.7 |
| African American | 2.7 |
| Other | 10.5 |
| Gender | |
| Male | 48.0 |
| Female | 45.3 |
| Non-Binary | 1.3 |
| Age of Students | |
| 14 | 13.3 |
| 15 | 20.0 |
| 16 | 8.0 |
| 17 | 14.7 |
| 18 | 37.3 |
| Number of Sports Students Played | |
| 0 | 41.3 |
| 1 | 33.3 |
| 2 | 13.3 |
| 3+ | 6.7 |

*Note*. Percentages may not add to 100 because of missing data.

**Table 3**

*Demographics Information From Participating Parents (N = 72)*

| Demographic | Percentage |
|---|---|
| Ethnicity | |
| White | 77.8 |
| Hispanic | 6.9 |
| Pacific Islander | 6.9 |
| Other | 2.8 |
| Gender | |
| Male | 48.6 |
| Female | 41.7 |
| Non-Binary | 4.2 |
| Age of Child | |
| 14 | 13.9 |
| 15 | 34.7 |
| 16 | 8.3 |
| 17 | 33.3 |
| 18 | 4.2 |
| Number of Sports Child Played | |
| 0 | 26.4 |
| 1 | 31.9 |
| 2 | 22.9 |
| 3+ | 12.5 |

*Note*. Percentages may not add to 100 because of missing data.

## Measures

I measured participant demographics, grit, and resilience. The demographics questionnaire was adapted with permission from Caldarella et al. (2019) to fit the current study. The measure consisted of eight questions with the purpose of ascertaining general background information on the participants and their level of involvement in sports (see Appendix A).

The researcher Angela Duckworth is synonymous with Grit, as she has developed a very widely used measurement called the Short Grit Scale (Duckworth & Quinn, 2009), which measures trait level perseverance and passion (see Appendix B). The Short Grit Scale was

normed on adults, young adults, and adolescents. Duckworth and Quinn (2009) conducted studies to examine the validity and reliability of the short Grit Scale. She found that across all studies the scale was both valid and reliable, with alphas ranging from .73–.82 and internal consistency of $r = .59$. When self-report and informant report were assessed, consensual validity was medium to high, $r = .45$. Some sample questions from the Grit scale are "Setbacks don't discourage me. I don't give up easily." And "I have difficulty maintaining my focus on projects that take more than a few months to complete."

As noted earlier, measuring resilience is complex because of multiple operational definitions that exist in the literature. As a result, there are many resilience scales, all of which have varying constructs with differing reliability and validity. Finding a measure that had a scale for both the adolescent as well as the parent proved to be difficult. Ultimately the short form of the Social-Emotional Assets and Resilience Scales for adolescents (SEARS -A) and the long form of the Social-Emotional Assets and Resilience Scales for parents (SEARS-P) were found to be best suited for the research. The short form of the SEARS-A differs from its longer counterpart by reducing the number of items from 35 to 12. The decision to use the short form of the SEARS-A measure was made because there were multiple student measures being used and out of respect for the participants time, I decided to use the short form, which show high levels of reliability as well as validity. The SEARS-A was normed on 714 students, 50% of which were female, 88% were Caucasian, 5% Latino, 2% African American, 1.5% Asian or Pacific Islander. The internal consistency coefficient for the SEARS-A is .83. The Pearson product-moment correlation for the SEARS-A short form to the SEARS-A long form ranges from .67 to .72. ($p <$ .01; Nese et al., 2012). The SEARS-P was normed on 1,173 parents, 60.4% of which were mothers. The children of the parents ranged in age from 4 to 18. The internal consistency

coefficient for the SEARS-P is .97 (Tom et al., 2009). Sample questions from the SEARS-A: "I am good at making decisions," "I stay in control when I get angry," "I care what happens to other people," "I am a responsible person." Sample questions from the SEARS-P: "Your child feels sorry for other people when bad things happen to them," "Your child is good at understanding the point of view of other people," "Your child stays calm when there is a problem or argument," "Your child works on chores and projects independently, without help."

**Procedures**

In line with best practices, the parents of the students were contacted via email prior to participating in the study (Eysenbach, 2004; see Appendices E and F). Eysenbach (2004) explains that every detail from context to incentives can influence the results of the survey. Both the grit scale and resilience scale were sent via email to the participants. I used Qualtrics to capture the responses of the participants. Qualtrics was chosen for data capture because of its ease of use and its familiarity with the researcher and participants. However, this also meant that I could not monitor the participants while they took the survey. It was a voluntary survey for the participants. This created a certain level of bias. Those who wanted to participate and choose to, may have been those who believed they already had high levels of resilience, or those with more sport involvement, which could skew the data.

To contact as many people as possible as efficiently as possible, email was chosen as the best method of contact. The email addresses were pulled from the online database that the school already had in place. This database was already a proficient means of communication that the parents and guardians of the students were accustomed to. The initial email sent to parents explained the study and that parent participation was requested along with their student, in conjunction with their high school and Brigham Young University. After 7 to 10 days a second

email was sent out with a consent form link to the Qualtrics survey. Only those who electronically sign the consent form were able to access the online survey. The survey was accessible for three weeks after which it closed.

After the initial attempt to gather data was completed the sample size was smaller than I had anticipated. I met with the principal of the high school to discuss other options for collecting data. After a handful of meetings, I decided it would be best to attend school orientation days in August and set up a booth in which the students and parents could fill out the survey in person. The school provided laptops for students and parents to take the survey and a QR code was created to allow them to take it from their mobile devices. Candy was given to those who participated to further incentivize participation. By the end of orientation days our sample size was 146 (74 students and 72 parents).

**Modification due to COVID-19**

Due to the COVID-19 pandemic our sampling methods underwent various changes. Our original plan of only using email to contact the students and parents did not produce the anticipated results. During this time, the parents and students received multiple emails regarding protocol changes as a result of COVID-19. I hypothesize that with the continuous stream of emails, the emails regarding our study may have been overlooked. As a result, I met with the school principal to brainstorm ideas for how to increase our sampling size. Ultimately, I decided the best option would be to set up a booth during orientation days in the fall for students and parents to take the online survey in person using either laptops the school provided at the booth or their mobile devices. I created a QR-code that once scanned took the participants to the correct survey (parent or student). I also used candy as an incentive for participating in the study.

In addition to making changes to our sampling, I also added one open-ended question regarding how COVID-19 may have impacted youth sport participation.

**Design and Analysis**

I used a causal-comparative survey design to address the two research questions. The questions regarding demographics and sport participation formed the independent variables while the grit and resilience measure questions form the basis of the dependent variables. I used both self-report and parent report to triangulate data and get a more accurate depiction of grit and resilience as it relates to sport. I planned to run a parallel exploratory factor analysis (EFA) of the SEARS-P and SEAR-A resilience on randomly selected data to determine the number of factors to extract. I planned to run an EFA with the goemin oblique rotation, utilizing the Worthington and Whittaker (2006) suggestions for keeping items: (a) all items with factor loadings less than .32 should be deleted, (b) all items with cross-loadings less than a .15 difference from the item's highest factor loading should be deleted, and (c) any factor with fewer than two items should be deleted unless the items are highly correlated ($r > .7$). I then planned to complete a confirmatory factor analysis (CFA) on the remaining data, allowing for latent variables to covary freely. To answer the research questions, I ran several structural equation models as explained in the results section below. I used qualitative analysis to examine student and parent responses as to whether and how the COVID-19 pandemic may have affected students' participation in sport.

# CHAPTER 4

# Results

## Results

Below I share the results from the various CFA's and data analysis of each of the research questions. Given that our final sample size was nearly half of what I anticipated (146 versus 300) it was necessary to forego the EFA on both the SEARS scales as well as the grit scale. This decision was also made because there had been ample psychometric research for both scales suggesting I could move straight to the CFA. Prior to conducting the CFA, I scored the results which included reverse coding one of the constructs for grit.

### CFA for Grit

Prior to beginning our first CFA, I set cutoffs for goodness of fit (RMSEA at or below.08, CFI at or above .9, TLI at or above .9, SRMR at or below .08). The results from the CFA for the parent grit scale were as follows; CFI .957, TLI .939, RMSEA .077, SRMR .072. The results for the student grit scale were as follows CFI 1.0 TLI 1.0, RMSEA .133, SRMR .045.

### CFA for SEARS

Prior to beginning our next CFA, I set cutoffs for goodness of fit based on (RMSEA at or below .08, CFI at or above .9, TLI at or above .9, SRMR at or below .08; J. Wang & X. Wang, 2019). The results from the CFA for the parent SEARS scale were as follows; CFI .708, TLI .69, RMSEA .077, SRMR .08. Even though the CFA did not meet the TLI and CFI cutoffs I decided to carry on because it met the SRMR and RMSEA cutoffs. The results for the student SEARS scale were as follows CFI .918, TLI .888, RMSEA .075, SRMR .085. I decided to move forward because the resulting data met two of the cutoffs.

When I attempted to run the structural equation model I ran into some difficulty. From the outset I could not get the model to converge. I used the Bayesian estimator to try to achieve convergence, however it was not successful. I then decided to use linear regression with composites instead of latent variables to answer each of the research questions separately. I also used a Pearson R to answer the research question exploring the relationship between grit and resilience. Our findings for the research questions were not what I expected. This will be discussed in depth in the discussion section.

Regarding the first research question, "Do adolescents who participate in sports have higher levels of resilience than those who do not?", I found that there was no difference between high school students who participated in sports and those who did not from both the student ($p$ = .195) and parent ($p$ =.852) data (see Table 4 below).

**Table 4**

*Student and Parent p-Value Results for Resilience*

| Variable | Student Data *p*-value | Parent Data *p*-value |
|---|---|---|
| Gender | .385 | .439 |
| Ethnicity | .031 | .161 |
| No Sports | .852 | .195 |
| 1 Sport | .216 | .318 |
| 2 Sports | .933 | .536 |
| 3 Sports | .897 | .017 |

Regarding the second research question, "Do adolescents who participate in sports have higher levels of grit than those who do not?", I found that there was no difference between high school students who participated in sports and those who did not from both the student data ($p$ = .121) and parent ($p$ = .119) data (see Table 5 below).

**Table 5**

*Student and Parent p-Value Results for Grit*

| Variable | Student Data *p*-value | Parent Data *p*-value |
|---|---|---|
| Gender | .465 | .555 |
| Ethnicity | .273 | .156 |
| No Sports | .121 | .119 |
| 1 Sport | .799 | .389 |
| 2 Sports | .979 | .427 |
| 3 Sports | .622 | .465 |

The third research question examined whether there was a correlation between grit and resilience. I found that there was not a strong or positive correlation ($r$ = -.283, $p$ = .108).

The next two research questions examined the number of sports as they related to both grit and resilience scores. I found that, according to the student data, if students played three or more sports that had significantly increased levels of resilience ($p$ = .017) with an effect size of .296. However, playing one or two sports was not significant for the student data: one sport ($p$ = .318), two sports ($p$ = .536). The parents did not agree with the students, in that there was no

significance no matter the number of sports the students played ($p = .216$ for three or more sports, $p = .993$ for one sport, and $p = .897$ for two sports).

A supplemental research question asked "if" and "how" COVID -19 affected students' participation in sport. While this was not one of the initial questions, I felt it would be important to understand and explore how and if COVID-19 was impacting the students. This question was a qualitative question, leaving it open ended for students and parents to respond to. The most common themes from the students are represented below. The most common theme was that COVID-19 negatively affected students because they were not able to play due to cancelations or health concerns ("My whole lacrosse season got canceled."). The second most common response was seasons got cut short because of COVID-19 ("A lot of events and games got shut down because of health concerns."). The third most common theme was that of mental challenges and or setbacks that COVID-19 had on the students ("[COVID-19] negatively affected my level of commitment.").

For the parent data I saw a similar trend to that of the students above. The most common theme was that the students were not able to play as a result of COVID-19 ("His tennis season ended after one match"). The second theme was games and or practices being limited due to COVID-19 ("He and the rest of his team tested positive, so games and practice had to be postponed"). The third most common theme was mental challenges as a result of COVID-19 ("[my son] feared getting infected").

# CHAPTER 5

## Discussion

The purpose of this study was to replicate and expand upon research that had previously been conducted by Caldarella et al. (2019) by examining if participation in sport impacts levels of resilience and grit. Each research question will be addressed here. Limitations and ideas for future research will also be discussed.

### Research Questions 1 and 2

Our first two research questions examined whether high school students who participated in sports had higher levels of grit and resilience then those who did not. I hypothesized that there would be higher levels of perceived grit and resilience in athletes compared to non-athletes. This hypothesis was supported by previous research. Previous studies examined mental toughness, of which resilience was a construct, and found that athletes did have higher levels compared to non-athletes (Guillén & Laborde, 2014; Laborde et al., 2016). Similarly, From et al. (2020) found that elite athletes had higher levels of grit and its subscale of passion compared to non-athletes. Caldarella et al. (2019) also found that high school sport participation was associated with higher levels of resilience. However, our study showed no such findings, there was no difference in athletes and non-athletes as far as grit or resilience were concerned. The reasons for these findings may be due to both our relatively small sample size and the impact of the COVID-19 pandemic on students' sport participation.

### Research Question 3

For our third research question I examined the relationship between grit and resilience. Based on their similarity of having to deal with an aspect of what could be deemed mental toughness I hypothesized that there would be a positive correlation between grit and resilience.

Most of studies I reviewed that asked a similar question used a different population. However, regardless of the population there seemed to be a consistent finding that grit and resilience were distinct and moderately to strongly correlated (see e.g., Kannangara et al., 2018; Meyer et al., 2020). However, our findings suggested there was no correlation between grit and resilience. The reasons for our findings are unknown but may be due to the unique high school population I studied as well as the collection of data during the COVID-19 pandemic.

**Research Questions 4 and 5**

For our fourth and fifth research questions I explored whether the number of sports a student played had an impact on the perceived levels of grit and resilience. Based on the Caldarella et al. study (2019), I hypothesized the number of sports played would be positively correlated with grit and resilience. I found that students who reported playing three or more sports had significantly higher levels of perceived grit and resilience than those who played fewer or no sports, which partially supported our hypothesis. However, results of parent reports were not significant. The reasons for these differences were unclear, though may be related to the fact that sport participation and students' grit and resilience during COVID-19 were likely negatively impacted.

**Research Question 6**

Our sixth research question explored whether parents and students agreed on perceived levels of resilience and grit. Overall, both parents and students agreed on perceived level of grit and resilience. One exception was the level of resilience perceived if students played multiple sports, with students reported significantly higher levels of both grit and resilience when they played three or more sports than did parents.

**Research Question 7**

Regarding our supplemental question as to whether COVID-19 impacted students' sport participation I found that the responses fell under three distinct themes. Those themes were season cancellations, games and or practices being affected, and mental challenges. These findings are corroborated by multiple studies looking at the impact of COVID-19 on sports and athletes. In one such study, researchers found that athletes experienced greater levels of stress leading to burnout (Kannangara et al., 2018; Scerri & Grech, 2021). Sayyd et al. (2021) conducted a systematic review of the impact of COVID-19 on sports affairs and found the following themes: cancellation of events and constraints being placed on physical activity. This gives evidence that the experience of the participants in the study are not outliers.

**Limitations**

As noted earlier, one of the biggest factors that I believe negatively affected this study was the impact that COVID-19 had on both the students and their parents. Killgore et al. (2020) found that psychological resilience was lower during the pandemic than the published norm. He theorized that the ongoing crisis had negative effects on emotionality which directly affected perceived resilience. Killgore et al. also found that physical exercise and days spent outside were predictive of significantly greater resilience during this time. As found from the qualitative question, these students were being limited in the ways they could exercise due to season, game, and practice cancelations. This could have created the negative emotionality that Killgore et al. references. Further, if resilience levels were below the norm during COVID-19 to begin with, as Killgore et al. suggests, it may have diminished grit levels as well.

Secondly, I believe COVID-19 had a direct impact on our sample size. The Caldarella et al. (2019) study I wished to replicate and expand upon had a sample size of 276. Our sample size

was roughly half of that. During COVID-19 both students and parents were bombarded with emails that contained updates on new policies, procedures, event cancelations, and event changes. Both students and parents were receiving multiple emails a week during this time. Our initial contact via email may have been lost in the multitude of emails or pushed aside as not as important compared to the ongoing changes to the school year because of COVID-19, thus, greatly diminishing our sample size. This phenomenon had been seen in other research fields as well. Harper et al. (2020) explained that recruitment of participants during COVID-19 was greatly reduced causing a suspension in many research studies. Other high school researchers from the United Kingdom found that getting participants and navigating the school protocols and logistics made it increasingly difficult to conduct research (National Institute of Health Research School for Public Health Research, 2021).

Another of the potential reasons I may not have found significance could be due to the choice of measures. The SEARS scale is not a common scale of resilience. The most common scale of resilience is the Connor-Davidson Resilience Scale (CD-RISC10; Connor & Davidson, 2003), and would have been preferred over the SEARS. Further, the CD-RISC10 has previously been tested for the use in sport and found to be both a valid and reliable measure (Gonzalez et al., 2016). Galli and Gonzalez (2015) caution against how researchers operationalize resilience when studying this construct. Southwick et al. (2014) explains that resilience can be measured as three qualitatively different constructs, trait, process, outcome. I believe this to be at the heart of the issue when deciding which measure to use. The SEARS seems to measure more trait resilience where I believe the resilience inherent in sport that is developed is outcome resilience. However, I wanted to replicate the Caldarella study and thus chose to follow by using the SEARS. There are many operational definitions for resilience that use different constructs. For

instance, the SEARS uses a three-factor resilience model consisting of self-regulation, empathy, and social competence. The CD-RISC10 uses a four-factor resilience model consisting of hardiness, faith, persistence, and purpose. A different adolescent resilience scale developed by Oshio et al. (2003) utilizes a three-factor resilience model consisting of novelty seeking, emotional regulation, and positive future orientation. A fourth resilience scale for adolescents developed by von Soest et al. (2010) utilizes a five-factor resilience model comprised of personal competence, social competence, structured style, family cohesions, and social resources. There is a litany of resilience scales and each measures resilience in a slightly different way. If we had used a different resilience measure, we may have gotten different results.

Finally, the impact of other extra curriculars may have impact perceived resilience and grit scores. Sport is not the only extracurricular that students participate in. Other areas of performing arts, debate, and other clubs, may potentially impact levels of perceived resilience and grit. For example, Zarobe and Bungay (2017) found that the performing arts had a positive effect of self-confidence, self-esteem, and building strong peer relationships. Thus, it is entirely possible that students who did not participate in sports may have participated in other extracurricular activities such as the performing arts, which may increase their levels of perceived resilience and grit, thereby affecting the study results.

**Future Research**

There are four main suggestions for future study. First and foremost, it would be best to revisit this study in times not affected by COVID-19. We believe the interruption caused by COVID-19 in the sporting and academic worlds had a major impact on students and their perceived levels of grit and resilience and in our recruitment efforts. With less turmoil in their lives, students and parents may be more willing to participate in voluntary research studies.

Using a different measure for resilience may produce different results from the ones observed in this study. Much of this would depend on how the researcher is defining resilience and whether the researcher is using a process, trait, or outcome definition. The SEARS measure may be a better marker for social intelligence and resilience but not for a post-traumatic growth view of resilience. A measure such as the CDRISC-10 may be better suited for measuring resilience as it is defined using a post-traumatic growth lens. The CDRISC-10 may be better suited to measure resilience as it relates to sport because it me may do a better job of measuring process-oriented resilience. It asks questions such as "stress makes me stronger" and "I believe I can achieve goals despite obstacles." These process-oriented questions may assess process-oriented resilience which I believe is the subset of resilience that grows with sport. The use of the SEARS itself may have confounded the findings due to the constructs it specifically measures, which is likely not limited to being impacted by sport.

A more expansive study of the students may provide a more accurate and deeper picture into resilience and grit. Rather than just looking at sports as an area for studying resilience and grit, expanding to other extracurricular activities also appears beneficial. Researchers may then be able to examine the level of impact each extracurricular has in comparison to each other. It may, however, be difficult to isolate extracurriculars since many students participate in multiple extracurriculars.

Lastly, a more expansive examination of various sports in general may produce insightful information as it pertains to grit and resilience. A next step in research as it pertains to sport and resilience and grit could be to examine each sport and its' effect on both grit and resilience. This could then be taken further by examining team sports versus individual sports and their impact on grit and resilience.

The impact that COVID-19 had on this study as well as the participants cannot be understated. This raises questions for future studies looking at how COVID-19 impacted adolescents. How far reaching is the impact? If sports provided a primary outlet or coping mechanism for youth, and was taken away for multiple years, what is the impact? A future qualitative study exploring this impact could also be insightful and help to peel back the layers of impact that COVID-19 had.

**Conclusion**

In this study we found that if high school students played three sports or more the students perceived levels of resilience was significantly greater than their peers who did not participate in multiple sports. However, the results did not support the other hypotheses. Based on other studies (Caldarella et al., 2019; Şahin, 2013) grit and resilience appear to be impacted by sports. As Kahneman (2011) suggests, we were doomed by our relatively small sample size. Further, the sample we did obtain may not have been an accurate representation of the population. The effects of COVID-19 also had a major impact on sport participation; thus, it is advised to replicate the study under normal circumstances.

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# APPENDIX A

## Demographics/Sports Participation Survey for Students

1. What gender do you most closely identify with?
    a. Male
    b. Female
    c. Other?
2. What grade are you in?
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
3. What is your age?
    a. 13
    b. 14
    c. 15
    d. 16
    e. 17
    f. 18
4. What ethnicity do you most closely Identify with?
    a. Caucasian
    b. Hispanic/Latino
    c. African American
    d. Asian
    e. Pacific Islander
    f. Other
5. Do you participate in any organized sports?
    a. Yes
    b. No
6. What organized sports do you participate in (check all that apply)?
    a. Soccer
    b. Football
    c. Basketball
    d. Swimming
    e. Volleyball
    f. Tennis
    g. Golf
    h. Track
    i. Cross Country
    j. Lacrosse
    k. Other
    l. None
7. How many organized sports did you participate in last calendar year?

   a. 0
   b. 1
   c. 2
   d. 3+
8. How long has it been since you last participated in an organized sport?
   a. 1 week
   b. 1 month
   c. 3 months
   d. 6 months
   e. 1 year or longer
9. Has the COVID-19 pandemic affected your participation in organized sports?
   a. No
   b. Yes – if so, please explain how _____
10. Do you participate in any extracurriculars that would not be qualified as a sport (theater, band, debate, etc.)?
   a. Yes
   b. No

# APPENDIX B

## Demographics/Sports Participation Survey for Parents

1. What gender does your child most closely identify with?
    a. Male
    b. Female
    c. Other?
2. What grade is your child in?
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
3. What is your child's age?
    a. 13
    b. 14
    c. 15
    d. 16
    e. 17
    f. 18
4. What ethnicity does your child most closely Identify with?
    a. Caucasian
    b. Hispanic/Latino
    c. African American
    d. Asian
    e. Pacific Islander
    f. Other
5. Does your child participate in any organized sports?
    a. Yes
    b. No
6. What organized sports does your child participate in (check all that apply)?
    a. Soccer
    b. Football
    c. Basketball
    d. Swimming
    e. Volleyball
    f. Tennis
    g. Golf
    h. Track
    i. Cross Country
    j. Lacrosse
    k. Other
    l. None

7. How many organized sports did your child participate in the last calendar year?
    a. 0
    b. 1
    c. 2
    d. 3+
8. How long has it been since your child last participated in an organized sport?
    a. 1 week
    b. 1 month
    c. 3 months
    d. 6 months
    e. 1 year or longer
9. Has the COVID-19 pandemic affected your child's participation in organized sports?
    a. No
    b. Yes – if so, please explain how _____
10. Does your child participate in any extracurriculars that would not be qualified as a sport (theater, band, debate, etc.)?
    a. Yes
    b. No

APPENDIX C

## Grit Scale for Students

Here are several statements that may or may not apply to you. There are no right or wrong answers, so just answer honestly, considering how you compare to most people. At the end, you'll get a score that reflects how passionate and persevering you see yourself to be.

1. New ideas and projects sometimes distract me from previous ones.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

2. Setbacks don't discourage me. I don't give up easily.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

3. I often set a goal but later choose to pursue a different one.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

4. I am a hard worker.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

5. I have difficulty maintaining my focus on projects that take more than a few months to complete.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

6. I finish whatever I begin.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

7. My interests change from year to year.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

8. I am diligent. I never give up.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

9. I have been obsessed with a certain idea or project for a short time but later lost interest.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

10. I have overcome setbacks to conquer an important challenge.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

APPENDIX D

**Preliminary Survey Request Email**

Dear Parent of XXXXX High Student,

The David O. McKay School of Education at Brigham Young University in conjunction with XXXXX High School is requesting your participation in an important survey to gather information regarding adolescent sport participation and adolescent resilience (ability to positively overcome or recover from adversity or stress). We will be emailing out further information one week from today including a link to the survey. Participation in the survey is completely voluntary and should take no longer than 10 minutes of your time. **Upon completion of the survey, you will have the opportunity to enter your email address into a drawing to be randomly selected for 1 of 10 $50.00 Visa pre-paid gift-cards.**

The information provided in this survey is completely anonymous and extremely important to a current research project. Your participation in this effort is greatly appreciated.

Thank You,
Rory Waldman, M.A.
Counseling Psychology Doctorate Student David O. McKay School of Education

Paul Caldarella, Ph.D.
Professor
David O. McKay School of Education

APPENDIX E

**Survey Request Email**

**Parent Consent**

**Title: Sport Survey Study**

Dear Parent,

About one week ago, you received an email informing you about a study on adolescent sport participation and resilience (ability to positively overcome or recover from adversity or stress).

We ask that you take 5 to 10 minutes to answer some questions regarding your high school student's background, participation in sports, and your perceptions of their resilience. We would appreciate receiving your response by _____ (Date), as this study cannot proceed until the data is received. Also, as mentioned in the previous email participation in this study will qualify you to be entered into a drawing for 1 of 10 $50.00 prepaid Visa gift-card.

There are no known or anticipated risks associated with participation in this research. Benefits include a greater understanding of potential factors that may contribute to and enhance adolescent resilience. All responses to the survey will be kept completely confidential and will not be linked back to you or your child.

Participation in this research is voluntary. You have the right to withdraw at any time or refuse to participate entirely without any consequence to you or your student.

If you have questions regarding this study or would like to have access to the results upon completion of the study, you may contact the primary researchers via email. Rory Waldman (Rkiwaldman@gmail.com) or Dr. Paul Caldarella (paul_caldarella@byu.edu).

If you have any questions about your rights as a research participant, you may contact IRB Administrator, Brigham Young University, A-285 ASB, Provo, UT 84602; 801-422-1461 or irb@byu.edu.

By completing the following questionnaire, you are consenting to the use of your responses in this research project. Please follow the link below to begin the questionnaire.

**Web Link**

Upon completion of the survey located at the above web link you will have the opportunity to be entered into the drawing for 1 of 10 $50.00 prepaid Visa gift-card if you chose to.

Thank you for taking the time to participate in this important study.

Rory Waldman, M.A. (Doctoral Student) and Paul Caldarella, Ph.D. (Professor)
BYU Counseling Psychology and Special Education Department

APPENDIX F

## Adolescent Assent Form

**Adolescent ASSENT (13-18 YEARS OLD)**

**Title: Sport Survey study**

**What is this research about?**
My name is Rory Waldman and I am a doctoral student at Brigham Young University (BYU)**.** I want to tell you about a research study I am doing with some other people at BYU. A research study is a way to find the answers to questions. We are trying to learn more about how sports affect adolescents. If you agree to participate you will be asked to complete an online survey.

**How long will this take?**
The survey should take you about 5 to 10 minutes to complete.

**Do I need to worry about anything?**
No, the information you would provide us is of a non-sensitive nature.

**Can anything good happen to me?**
We don't know for sure if being in this study will help you, though we hope it will. We do expect to learn something that will help others. We will be having a drawing to randomly select ten students who will get a $50.00 Amazon gift card. If you are one of the lucky winners, we will email you a link to the gift card.

**Do I have other choices?**
You can choose not to be in this study.

**Will anyone know I am in the study?**
We won't tell anyone you were in this study. When we are done, we will write a report about what we learned. We won't use your name in the report.

**What happens if I get hurt?**
We don’t think anything different will happen because of the study to hurt you. Being in the study won’t seem any different.

**What if I do not want to do this?**
You don't have to be in this study. It's up to you. If you say yes now, but change your mind later, that's okay too. All you have to do is tell us. Before you say yes to be in this study, be sure to ask an adult (your parent) to tell you more about anything that you do not understand. By completing the following questionnaire, you are consenting to the use of your responses in this research project. Please follow the link below to begin the questionnaire.

**Web Link**

Thank you for taking the time to participate in this important study.

Rory Waldman, M.A. (Doctoral Student) and Paul Caldarella, Ph.D. (Professor)
BYU Counseling Psychology and Special Education Department

# APPENDIX G

## IRB Approval Letter

**Memorandum**

To: Paul Caldarella
Department: BYU - EDUC - Counseling, Psychology, & Special Education From: Sandee Aina, MPA, HRPP Associate Director

Wayne Larsen, MAcc, IRB Administrator Date: March 18, 2021

IRB#: IRB2021-055
Title: High School Sports Participation: Effects on Students' Grit and Resilience

Brigham Young University's IRB has approved the research study referenced in the subject heading as exempt level, category 2. This study does not require an annual continuing review. Each year near the anniversary of the approval date, you will receive an email reminding you of your obligations as a researcher and to check on the status of the study. You will receive this email each year until you close the study.

The study is approved as of 03/18/2021. Please reference your assigned IRB identification number in any correspondence with the IRB.

Continued approval is conditional upon your compliance with the following requirements:

1. A copy of the approved informed consent statement can be found in iRIS. No other consent statement should be used. Each research subject must be provided with a copy or a way to access the consent statement.
2. Any modifications to the approved protocol must be submitted, reviewed, and approved by the IRB before modifications are incorporated in the study.
3. All recruiting tools must be submitted and approved by the IRB prior to use.
4. Instructions to access approved documents, submit modifications, report adverse events, can be found on

   the IRB website, iRIS guide: https://irb.byu.edu/iris-training-resources

5. All non-serious unanticipated problems should be reported to the IRB within 2 weeks of the first awareness

   of the problem by the PI. Prompt reporting is important, as unanticipated problems often require some modification of study procedures, protocols, and/or informed consent processes. Such modifications require the review and approval of the IRB. Please refer to the IRB website for more information.

APPENDIX H

**Dissertation Timeline**

1. Finish Literature Review and Proposal Early October
2. Defend proposal Mid October
    a. Make necessary alterations
3. IRB approval December
    a. Make necessary alterations
4. Meet with Principles December and January
    a. Meet with the various principles and make sure they are on board and understand the study.
5. Create Qualtrics Survey - Finish by Late December/Early January
    a. Upload scales to Qualtrics
    b. Create demographics questions
    c. Create questions regarding sports and non-sport activity
6. Send the survey to Participants/gather data Early February
    a. Send the survey and wait a couple of weeks
    b. Enter the data into SPSS
7. Analyze the data March
    a. Transform the data in SPSS
8. Write up results April
    a. Discuss the statistics and significance of the results
9. Write up discussion May
    a. Summarize
    b. Discuss limitations
    c. Where should the research go next
10. Finish Dissertation June
    a. Make finishing touches to dissertation
11. Defend Dissertation June/July