

A META-ANALYSIS OF SOCIAL EMOTIONAL LEARNING OUTCOMES
IN CHALLENGE COURSE PROGRAMS

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A Meta-Analysis Of Social Emotional Learning Outcomes In Challenge Course Programs

Thesis directed by Assistant Professor Bryn Harris

ABSTRACT

The objective of this study was to measure the effectiveness of challenge course programs in building students' skills related to the core competencies of the CASEL model for social emotional learning (SEL) through a meta-analysis of challenge course program studies. The total sample, from twenty control group studies, consisted of 1401 students (697 in control groups, 704 in experimental groups). Outcomes were categorized based on five core competencies of SEL: self-awareness, self-management, social awareness, relationship skills and responsible decision-making. Measures relating to self-awareness across studies had a moderate mean effect (mean $d = 0.41$), suggesting that challenge course programs may have positive outcomes in constructs underlying the core SEL competency of self-awareness. This study also provides new information that can help provide a framework of common language when considering program outcomes across school, experiential education and therapeutic programs.

The form and content of this abstract are approved. I recommend its publication.

Approved: Bryn Harris

*For every child who should get to feel the sun on their skin, wind in their hair, dirt on their feet
and all of what the healing touch of nature can do for our bodies, our minds and our spirits.*

For Adam, Josh and the rest of you who ran barefooted with me when we were kids.

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CHAPTER I

REVIEW OF LITERATURE

Social Emotional Needs of Children and Adolescents

Societal Impact

One does not have to look far to see the importance in addressing social emotional needs among children in the U.S. For example, 20.2% of high school students nationwide reported being bullied on school property, and 22.6% reported being in a physical fight in 2015 (Kann, et al., 2016). Further, only 27.3% of high school students reported getting adequate sleep on an average school night, 41.7% reported playing video/computer games or other computer use un-related to school for 3 or more hours on an average school day, 29.9% reported being so sad or hopeless for at least two weeks in a row that they stopped doing their usual activities and 17.7% reported seriously considered attempting suicide within the last year. In 2013 the national high school dropout rate, although down from 12% in the 1990s, was still at 7% (National Center for Educational Statistics, 2016).

One recent study, including 148,189 middle school and high school students, showed that only 29-45% felt they had empathy, decision-making and conflict resolution skills, and only 29% felt that their school provided a caring and nurturing environment (Benson, 2006). The same study showed that 55-65% of the students were engaged in learning and motivated to do well in school, while 42-48% felt control over things that happen to them and felt a high sense of self-esteem. Of the students in this study, 50-52% reported placing a high value on helping others, promoting equality and reducing hunger and poverty.

Complexity of Addressing the Social Emotional Needs of Children and Adolescents

Consideration of the potential causes underlying social emotional concerns among school age students can be difficult, as suggested even by the variety of contributing factors monitored through programs such as the Youth Risk Behavior Surveillance System (2016), Centers for Disease Control (2016) and National Center for Educational Statistics (2016). This highlights the complexity of meeting the social emotional needs of young people in our society. Factors impacting an individual's development stem from both internal and external sources, and are unique to each individual.

Programs promoting early identification and wrap-around services such as Safe Schools Healthy Students and Project Launch, joint initiatives of the U.S. Departments of Education, Health and Human Services and Justice, seek to address the complexity of addressing these needs (2017). For example, both programs incorporate multi-disciplinary team and multi-agency approaches to addressing the needs of the child, as well as highly collaborative processes between agencies and families. This may include physical, social, emotional, cognitive and behavioral aspects of development. As just one example of this evolution in programming to address the needs of the whole child, social and emotional aspects of learning have only recently been directly addressed in education (Durlak, 2015).

Social Emotional Learning in Schools

Essential Role of Social Emotional Learning

The essential role of promoting and integrating social and emotional learning (SEL) with academic learning in schools, although relative recent in our history, has

been well documented (Elias, et al., 1997 and Zins, Weissberg, Wang & Walberg, 2004). It has even been argued that the true core of education is found in the social and emotional relationship that has been cultivated between a teacher and student (Shriver, 2015).

SEL is the process through which we learn to recognize and manage emotions, care about others, make good decisions, behave ethically and responsibly, develop positive relationships and avoid negative behaviors (Elias, et al., 1997). While a number of studies have established correlations between pro-social behavior and positive academic outcomes (e.g., DiPerna & Elliott, 1999; Feshbach & Feshbach, 1987; Haynes, Ben-Avie & Ensign 2003; Pasi, 2001; Cobb, 1972; Malecki & Ellitt, 2002; Welsh, Park, Widaman, & O'Neil, 2001; Wentzel, 1993), recent reviews of the literature have called for empirical evidence to support the design and implementation of SEL interventions that will improve children's success in school and life (Zins, et al., 2004).

A Conceptual Model of Social Emotional Learning

The Collaboration for Academic, Social, and Emotional Learning (CASEL) is a Chicago-based non-profit organization, beginning in 1994, with the overarching mission to promote the integration of academic, social and emotional learning in schools (CASEL, 2016). The CASEL model has established essential SEL competencies reflecting personal skill development, including self-awareness, social awareness, self-management, relationship skills, and responsible decision-making (Collaboration for Academic, Social, and Emotional Learning, 2003).

Strong arguments have been made for integration of evidence-based SEL interventions across supportive learning environments in schools in order for students

to benefit from generalizing these skills, and meet competencies such as those put forth by the CASEL model for SEL (Hawkins, 1997). Successful generalization of skills will lead students towards positive attitudes towards self and others, positive social behaviors, fewer conduct problems, decreased emotional distress and improved academic performance (CASEL, 2003).

Challenge Course Programs

History

Challenge (ropes) courses have been evolving since 1941, when they were designed and built to enhance physical capabilities (agility, balance, and coordination), to today, addressing problem-solving skills as well as individual and group dynamics issues (Rohnke, Rogers, Tait and Wall, 2007). Project Adventure first built a challenge (ropes) course at a high school in 1971, establishing initial use for high school aged students for physical education that has since extended to a broad range of uses in education, recreation, therapy and organizational development.

Low challenge courses and high challenge courses differ in that low courses generally include activities that require spotting, while high challenge courses require belaying (Priest and Gass, 2005). Low courses have been described as generally focusing on group problem solving and team building, with activities from ground level up to 12 to 13 feet, while high courses generally focus more on physical and mental challenges for individual development (Rohnke, et al., 2007).

Empirical Evidence

Considering the long history of challenge courses, there is only a small body of research that exists on the topic (Attarian & Holden, 2005). One early evaluation of

Project Adventure's adaptation of Outward Bound principles in a high school in the 1970's (mentioned above), showed increased self-esteem and a more internalized locus of control (Rohnke, 1977 & Prouty, 1999).

Following that time, researchers hypothesized that the potential benefit of challenge courses likely reaches far beyond just these two constructs, despite little empirical evidence (Gillis & Thompson, 1996). Though the body of research remains small, one more recent study revealed positive outcomes of challenge course programs substantially further reaching than the constructs of self-esteem and locus of control to include self-efficacy, personality, behavior, academic, environmental, attitudes, family, physical and group dynamics (Gillis and Speelman, 2008).

Meta-Analysis as a Method of Synthesizing the Research

Meta-analysis of Social Emotional Learning Studies

A meta-analysis is a quantitative synthesis of research to reveal patterns in outcomes across a body literature (Lipsey & Wilson, 2001). In effect, it establishes a consensus in the literature on a particular topic, or reveals a need for more research in a given area. While a number of synthesis studies have been completed in the last decade on the broad topic of school programming that might in part address SEL, only two studies have focused specifically on the impact of SEL programs (Payton, 2008 & Durlak, 2011).

In particular, Durlak (2011) established that SEL programs were effective in producing significant positive outcomes in social-emotional competencies, attitudes about self/others/school, increase pro-social behaviors, decreased anti-social behaviors, decreased internalized problems and improved academic performance.

Thus they concluded that programs addressing the five core SEL competencies of the CASEL model, had further reaching effects on attitudes, behaviors and even academic performance.

Meta-Analysis of Challenge Ropes Program Studies

There have been a small number of synthesis studies on the broad topic of adventure programming that have included challenge courses in the last twenty years, only one such study has focused specifically on challenge courses (Gillis & Speelman, 2008). This study revealed positive outcomes of challenge course programs on self-efficacy, personality, behavior, academic, environmental, attitudes, family, physical and group dynamics. This fits with a more recent study, which found positive outcomes for the categories of academic, behavior, clinical, family development, physical, self-concept and social development in a much broader sample of 197 studies on a variety of adventure therapy programs (Bowen, 2013).

CHAPTER II

INTRODUCTION TO RESEARCH

Social Emotional Learning Through Challenge Course Programs

It has been established that program studies between 1986-2006 demonstrated the effectiveness of challenge courses in producing positive outcomes for participants of all ages (Gillis & Speelman, 2008). However, only 22 of the 44 studies in this meta-analysis pertained to adolescents (middle school and high school students). In the last decade one would expect that more studies have been published that would add power to a synthesis of the research and enable a focus on a more specific population, such as school age children.

Further, a number of the outcomes measured by Gillis & Speelman (2008) appear to coincide with the outcomes relevant to SEL established by Durlak (2011). For example, measures of self-esteem, locus of control and self-efficacy according to Gillis & Speelman may coincide with attitudes towards self according to Durlak. Also, challenge ropes course program outcome studies have measured social and emotional constructs that could be coded according to the CASEL core competencies for SEL (Gillis & Speelman, 2008; Bowen, 2013; CASEL, 2016).

With the long history and interest of utilizing challenge courses in schools, it begs the question: Are challenge courses effective in building social emotional learning (across self-awareness, self-management, social awareness, relationship skills and responsible decision-making) among school-aged students? This is a question that has not yet been answered by current research, but could strengthen the empirical

evidence to characterize challenge ropes courses as a valuable SEL programming strategy for schools.

Multiple respected researchers in the field have stated the need for more empirical evidence supporting programming implementation and outcomes of challenge ropes courses (Rohnke et al., 2007, Martin, et al. 2006). This concern has been raised in respect to understanding potential outcomes at a more comprehensive level, as well as establishing standards for program development and management (Neill, 2003). While the focus of this study is mainly on program outcomes, it comes with an understanding that only quality program development will lead to quality outcomes.

Hypothesis and Objective

The overarching hypothesis of this research is that challenge course programs are an effective programming strategy for helping school-aged students to meet social emotional learning objectives. Further it is proposed that the CASEL (2003) model for social emotional learning can provide a framework of common language that can stretch beyond schools to experiential education and therapeutic programs. The potential to bridge communication across these service fields that address the social emotional needs of children can be a valuable step in achieving comprehensive services. The objective is to measure the effectiveness of challenge course programs in building students' skills related to the core competencies of the CASEL model for social emotional learning through a meta-analysis of challenge course program studies.

Experimental Design

In accordance with the objective of this research, the goal with data collection was to identify a representative cross-section of studies measuring program outcomes for challenge ropes courses. A systematic collection of a non-biased and representative sample of published and unpublished studies was conducted in order to produce a representative sample of relevant challenge ropes course studies from January 1, 1986 through July 1, 2016. Studies were evaluated with eight unique inclusion criteria and four unique exclusion criteria in order to be considered eligible for review, adapted based prior meta-analysis studies (Gillis & Speelman, 2008; Durlak, 2011). Considerations for multiple interventions and cohorts accounted for potential replication of results.

Coding of descriptive variables allowed for the consideration of effect sizes based on type of publication, focus of the program, activity of the program, gender, race and ethnicity, participants grades in school and program hours. Coding of outcome variables, modeled according to the five core SEL competencies (CASEL, 2016), allowed for the consideration of effect sizes based on self-awareness, self-management, social awareness, relationship skills and responsible decision-making. All outcome variables were based on either published measures of social emotional constructs or direct measure of a continuous variable.

Examples of self-awareness outcomes included measures of self-concept, self-awareness, self-esteem, anxiety and depression. Examples of self-management outcomes included measures of disruptive behaviors, emotional control, honesty and trustworthiness and locus of control. Examples of social awareness outcomes included measures of attractions to group, group integration, awareness of others and social

acceptance. Examples of relationship skills outcomes were measures of aggression, peer social skills, bonding/cohesion and close friendship. Examples of responsible decision-making outcomes were measures of self-perception with jobs and scholastics and no repeat arrest.

A coding system was developed in Microsoft Excel™ by the primary researcher based on established practices in meta-analysis to include pertinent information about each program study (Lipsey & Wilson, 2001). This included general information and setting for the study, type of research design, established descriptive variables, outcome variables with statistical outcomes and reported effect sizes, and coding process. As a multiple rater format was not possible for this study, reliability was established through a process of coding the included studies multiple times for the same variables, then reviewing and comparing the established coding before settling on a final version.

Calculation and analysis of effect sizes (ES) followed the recommendations of Lipsey and Wilson (2001). ES was calculated such that a positive ES was equivalent to a larger effect in the treatment group when compared to the control group, and a negative ES represented a smaller effect in the treatment group when compared to the control group. Means and standard deviations, or when these were not available t-values or F-ratios, were used to calculate the standard mean difference effect sizes, with the respective 95% confidence intervals. This calculation also included weighting measures based on sample size (Lipsey & Wilson, 2001). Established parameters were used to describe standard mean difference effect sizes (Cohen, 1988).

Chapter 3 reviews this analysis in detail. This chapter highlights the meta-analysis of social emotional learning outcomes in challenge course programs. It also

includes a summary of the overall conclusions and potential future directions of this research.

Figure 1. Collaborative for Academic, Social, and Emotional Learning (CASEL) Social Emotional Learning Core Competencies (www.casel.org).



Self-Awareness	The ability to accurately recognize one's own emotions, thoughts, and values and how they influence behavior. The ability to accurately assess one's strengths and limitations, with a well-grounded sense of confidence, optimism, and a "growth mindset."	<ul style="list-style-type: none"> • Identifying emotions • Accurate self-perception • Recognizing strengths • Self-confidence • Self-efficacy
Self-Management	The ability to successfully regulate one's emotions, thoughts, and behaviors in different situations — effectively managing stress, controlling impulses, and motivating oneself. The ability to set and work toward personal and academic goals.	<ul style="list-style-type: none"> • Impulse control • Stress management • Self-discipline • Self-motivation • Goal-setting • Organizational skills
Social Awareness	The ability to take the perspective of and empathize with others, including those from diverse backgrounds and cultures. The ability to understand social and ethical norms for behavior and to recognize family, school, and community resources and supports.	<ul style="list-style-type: none"> • Perspective-taking • Empathy • Appreciating diversity • Respect for others
Relationship Skills	The ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. The ability to communicate clearly, listen well, cooperate with others, resist inappropriate social pressure, negotiate conflict constructively, and seek and offer help when needed.	<ul style="list-style-type: none"> • Communication • Social engagement • Relationship-building • Teamwork
Responsible Decision-Making	The ability to make constructive choices about personal behavior and social interactions based on ethical standards, safety concerns, and social norms. The realistic evaluation of consequences of various actions, and a consideration of the well-being of oneself and others.	<ul style="list-style-type: none"> • Identifying problems • Analyzing situations • Solving problems • Evaluating • Reflecting • Ethical responsibility

CHAPTER III
META-ANALYSIS OF SOCIAL EMOTIONAL LEARNING OUTCOMES IN CHALLENGE
COURSE PROGRAMS

Introduction

Social and emotional competence can be described as the ability to understand, manage and express the social and emotional aspects of a person's life in order to learn, form relationships, solve every day problems and adapt as we grow and develop (Elias, 1997). Further, social emotional intelligence has been established as a complex and essential ability to be effective in all critical domains of life, including school (Goleman, 1995). Addressing the complex needs of the whole child by attending to social and emotional aspects of learning and intelligence has only recently been brought to the forefront in education, as well as coordinated wrap-around services (Durlak, 2015; Project Launch, 2017).

Strong arguments have been made for integration of evidence-based Social Emotional Learning (SEL) interventions across supportive learning environments in schools in order for students to benefit from generalizing SEL skills, and meet competencies such as those put forth by the CASEL model for SEL (Hawkins, 1997). It has also been established that programs addressing the core competencies of the CASEL model for SEL have been successful in measurable outcomes, such as improving attitudes about self/others/school, increasing pro-social behaviors, decreasing anti-social behaviors, decreasing internalized problems and improving academic performance (Durlak, 2011).

Challenge (ropes) courses have a long history, dating back to 1971, of being used in school settings (Rohnke, 2007). While originally developed under the context of physical education, underlying intervention principles have been shown to result in increased self-esteem and a more internalized locus of control in high school students (Rohnke, 1977 & Prouty, 1999). More recently, a meta-analysis of challenge ropes course program studies established the effectiveness of these interventions in producing positive outcomes for participants of all ages (Gillis & Speelman, 2008). Thus, while the body of empirical evidence for challenge ropes courses continues to be relatively small, it has continued to grow and shows promise for the effectiveness of these interventions.

The hypotheses of this research were two-fold. First, the long history of challenge course programs in schools, coupled with a growing body of evidence in support of their effectiveness as a social and emotional intervention, suggests they can be a programming strategy for social emotional learning interventions in schools.

Second, the CASEL (2003) model for social emotional learning can provide a framework of common language that can stretch beyond schools to experiential education and therapeutic programs. Outcome studies of challenge ropes courses provide a promising data-set with which to do this, as both educational and therapeutic settings are represented. The potential to bridge communication across educational and therapeutic settings that address the social and emotional needs of children can be a valuable step in achieving comprehensive services.

The objective of this study is to measure the effectiveness of challenge course programs in building school-aged children's skills related to the core competencies of

the CASEL model for social emotional learning through a meta-analysis of challenge course program studies.

Materials & Methods

Literature Search. In order for a systematic collection of a non-biased and representative sample of published and unpublished studies, multiple strategies were used. Relevant studies were identified through computer searches using EBSCOhost (includes Academic Search Premier, ERIC, *PsychInfo and Behavioral Sciences Collection*) and *Dissertation Abstracts/Digital Dissertations at ProQuest*. The following search terms and their variants were used: *social and emotional learning, challenge ropes courses, adventure therapy, competence, assets, health promotion, prevention, positive youth development, social skills, self-esteem, empathy, self-efficacy, emotional intelligence, problem solving, conflict resolution, coping, stress reduction, children, adolescents, intervention, students, schools.*

The reference list of each identified study and bibliographies of studies used in prior meta-analyses of challenge ropes courses (Gillis, 2008; Attarian & Holden, 2005) were reviewed. In addition, searches were conducted in journals producing relevant studies from January 1, 1986 through July 1, 2016. These journals included: *Journal of Experiential Education, Journal of School Psychology, American Educational Research Journal, American Journal of Community Psychology, Child Development, Journal of Research in Adolescence, Journal of Youth and Adolescence, Psychology in the Schools* and *School Psychology Review*.

Inclusion Criteria. Studies eligible for review: 1) were written in English in order to be accessible to the researchers; 2) appeared in published or unpublished form

between January 1, 1986 through July 1, 2016; 3) emphasized the development of one or more social-emotional learning skills competencies according to the CASEL model (Figure 1); 4) targeted school-aged students; 5) included a control group; 6) included challenge course programming; 7) provided sufficient information to report effect sizes (ES) post and/or follow-up; 8) was a quantitative study with significant or non-significant ES; 9) outcome data was based on measure(s) with reported reliability and validity statistics or a measurable continuous variable.

Exclusion Criteria. Studies excluded from review: 1) included subjects who were adults or not school-aged individuals; 2) provided only single group pre-test and post-test studies; 3) were qualitative studies.

Multiple Cohorts. Multiple interventions from the same study were coded and analyzed separately if the data related to distinct intervention formats and separate cohorts, or if the study described data from an original cohort and a replication of results with a new cohort.

Coding Reliability. A coding system was developed in Microsoft Excel™ by the primary researcher based on established practices in meta-analysis to include pertinent information about each program study (Lipsey & Wilson, 2001). This included general information and setting for the study, type of research design, established descriptive variables, outcome variables with statistical outcomes and reported effect sizes, and coding process. As a multiple rater format was not possible for this study, reliability was established through a process of coding the included studies multiple times for the same variables, then reviewing and comparing the established coding before settling on a final version.

Descriptive Variables. Information was coded regarding the date of research, type of publication (ie. peer-reviewed journal article, thesis, dissertation), focus of program (ie. educational, developmental or therapeutic), activities conducted (ie. low/low and high/high challenge ropes course), population studied (ie. race/ethnicity, gender, grade levels), and program hours.

Outcome Variables. The outcomes for each study were coded by categorizing the specific outcome measures used in the study into each of the five core competency areas of the CASEL social emotional learning model (Figure 1). These five core competencies include self-awareness, self-management, social awareness, relationship skills and responsible decision-making. When an outcome measure related to multiple CASEL rubric areas, it was categorized only in the rubric area where it best fit the criteria. Outcomes were based either on evaluative social emotional scales measured by self-report or parent report (Table 1), or on a measurable continuous variable.

Statistical Analyses. Calculation and analysis of effect sizes (ES) was carried out using the web-based program, Practical Meta-Analysis Effect Size Calculator, developed by the same authors from their own thorough publication on the topic of meta-analysis (Lipsey & Wilson, 2001). ES was calculated such that a positive ES was equivalent to a larger effect in the treatment group when compared to the control group, and a negative ES represented a smaller effect in the treatment group when compared to the control group. Means and standard deviations, or when these were not available t-values or F-ratios, were used to calculate the standard mean difference effect sizes, with the respective 95% confidence intervals. This calculation also included weighting

measures based on sample size (Lipsey & Wilson, 2001). The following parameters were used to assess ES: large ES = .8, moderate ES = .5, low ES = .2 (Cohen, 1988).

Results

Descriptive Variables

In order to conduct this meta-analysis, an initial 121 studies were narrowed down to 20 studies meeting criteria for the analysis (Table 2). The total sample consisted of 1401 students (697 in control groups, 704 in experimental groups). Descriptive variables of these studies are described in Table 3. Peer-reviewed articles comprised 40% of the studies used, while the other 60% were a Dissertation or Thesis. Half of the studies were with educationally based programs, while 45% were with therapeutic programs and only one study measured a developmental program.

Only one study utilized an exclusively high ropes course, while 55% of the studies utilized low ropes and 40% of the studies utilized combination high and low ropes courses. Most studies, 80%, described mixed gender samples, while 50% of the studies involved multiple race/ethnicity groups and another 40% of the studies did not report the race/ethnicity of the sample. The grade levels represented in the studies were fairly evenly distributed between middle school (6th – 8th, 25%), middle/high school (6th – 12th, 35%) and high school (9th – 12th, 30%), with fewer studies representing the span from 3rd – 12th grade. Program hours were unreported in 40% of the studies, while 25% of the studies had programs of 8 hours or less, 15% were 9-20 hours and 20% were 21 hours or greater.

The overall mean ES for the included studies was 0.25, suggesting a small effect of challenge ropes courses on outcomes categorized into the CASEL social emotional

learning core competencies. However, when considered in more detail, multiple moderate to large effects were found. Peer-reviewed articles tended to have more moderate ES (mean $d = 0.51$) than dissertations and theses, which had small ES. Therapeutic programs tended to have more moderate ES overall (mean $d = 0.49$) than educational programs, while the single developmental program had a large overall effect size (mean $d = .98$). When considering studies based on activity type, low ropes and low/high ropes courses demonstrated small overall ES, while the single high ropes course demonstrated a somewhat large ES (mean $d = 0.77$).

Based on gender, the male only studies had a large overall effect (mean $d = 0.99$), while studies with mixed gender and female only had small ES. Studies with unreported race/ethnicity and studies involving exclusively Caucasian participants had moderate ES (mean $d = 0.48$ and 0.53 , respectively), while the study involving exclusively African-American participants had a large overall ES (mean $d = 0.98$). When considering grade level, studies involving students in the 6th – 12th grade range had moderate ES (mean $d = .47$), while other grade ranges had small effects. Studies involving more than 21 program hours had an overall moderate ES (mean $d = 0.53$), while effect based on shorter or unreported program hours was small.

Outcome Variables

For each of the 20 studies included in the meta-analysis, the standardized mean difference effect size, number of effect sizes, grade range of participants, number of participants and CASEL social emotional learning outcomes are listed in Table 4. Of the 20 studies, five had large mean effect sizes and three had medium mean effect sizes. Among the studies with large mean effect sizes, the outcomes were found to address the

CASEL competencies of self-awareness and self-management. Relationship skills were also found to be addressed in two of these studies, while social awareness and responsible decision-making were found to be addressed in one of the studies with a large mean effect size. Three of these studies included students in the 6th - 12th grade range, and two included students in the 9th - 12th grade range. Studies with medium mean effect sizes also had outcomes found to address self-awareness and self-management, as well as one study found to address relationship skills and one study found to address responsible decision-making.

When considering how outcome variables from the 20 studies in this analysis address the five CASEL core competency areas, 75% of the studies included measures related to self-awareness, 65% included measures related to self-management, 60% included measures related to social awareness, 40% included measures related to relationship skills and 25% included measures related to responsible decision-making. The mean effect sizes of outcomes addressing each of these five areas were generally small (mean $d = 0.11$ to 0.41), with measures relating to self-awareness across studies being the only area with a somewhat moderate mean effect (mean $d = 0.41$).

Discussion

In this study, we utilized 20 challenge course program outcomes studies, with publications ranging from 1989 to 2014. The total sample consisted of 1401 school-aged students (697 in control groups and 704 in experimental groups). We identified 10 moderate to large mean effect sizes based on descriptive variables across all studies, 8 moderate to large mean effect sizes based on individual studies and one somewhat moderate mean effect size based on the CASEL core competencies for SEL. Further, this

study established that outcomes could be meaningfully categorized into outcomes based on the CASEL core competencies for SEL. This study is the first of its kind to synthesize challenge course program outcomes according to established social emotional learning competencies.

The descriptive variables analyzed in this study provided an initial characterization of the data set based on categorical criteria similar to the only previously published meta-analysis of challenge course programs (Gillis & Speelman, 2008). Interestingly, based on unique data sets, both studies found moderate effect sizes for outcomes of therapeutic programs and low effect sizes for outcomes of educational programs. Considering that similar types of published survey instruments were used to measure outcomes across studies, this could be a reflection of both the intensity of need in the respective populations and the intensity of intervention in a therapeutic setting compared to an educational setting.

One other interesting similarity surfaced between these studies in regards to descriptive variables. In relation to the number of program hours, Gillis & Speelman (2008) found that programs 21-30 hours had a large effect size ($ES = .79$), while the current study found that programs greater than 21 hours had a moderate effect size ($ES = .53$). In both studies, programs less than 21 hours had small effect sizes, which could have meaningful implications for program implementation.

In considering outcome variables, the current study is the first of its kind to analyze outcomes of challenge course programs through the lens of established social emotional learning competencies. Findings of the previous published meta-analysis on challenge course programs found that the construct of self-efficacy had a moderate

mean effect size, while the current study found that the construct of self-awareness had a moderate effect size. The construct of self-awareness in the current study is a core competency of the CASEL model that includes self-efficacy.

Among many limitations, one major limitation to the current study is the manner in which coding variables into the five core competencies of the CASEL model was carried out. Ideally, a multi-rater system would establish reliability in coding by decreasing the bias inherent in having only a single coder. Such a system would greatly improve the power of this study. At the same time, measures were taken to minimize bias within the analysis through repetition of the coding process and the outcome variable categories based on CASEL SEL core competencies were reported in order to make any inherent bias as transparent as possible within the limitations of this study.

A second major limitation is the small number of studies in the sample. The data set was narrowed to from 120 studies to 20 studies, based on the stringent criteria needed to establish a meaningful analysis. While this resulted in 20 quality studies focusing on programs targeting school-aged students, the populations still varied quite widely based, most notably, on descriptive variables such as setting, program length and age range.

Finally, due to limited information provided within the studies, it was not possible to include any information regarding the fidelity with which programs were implemented or carried out. This type of information would provide valuable implications for future research and even possible program development. Having said this, this study did seem to imply that it would be reasonable to expect a well-designed

challenge course program to help with social emotional learning in the competency area of self-awareness.

Future research in this area can have promising implications for continuing to build the evidence base for utilizing challenge course programs to benefit school-aged students, not just as a physical intervention, but as a social and emotional intervention as well. In part, more detailed definition of challenge courses and learning objectives can help with this. Furthermore, as the awareness of the sweeping impact of social and emotional learning on the development of individuals continues to increase, the important role of wrap-around services will become more and more apparent. Future research can positively impact how agencies, communities, families and individuals are able to work together for the good of a child by helping to establish a common language through which we consider the needs of the whole child.

Table 1. Outcome variable categories based on CASEL Social Emotional Learning Core Competencies.

<u>CASEL Competency</u>	<u>Construct in Study</u>
Self-Awareness	Beck Youth Inventory (Anger)
Self-Awareness	Beck Youth Inventory (Anxiety)
Self-Awareness	Beck Youth Inventory (Depression)
Self-Awareness	Beck Youth Inventory (Self-concept)
Self-Awareness	Child Rating Scale (Anxiety/Withdrawal)
Self-Awareness	Children's Depression Inventory
Self-Awareness	Children's Physical Self-Perception Profile
Self-Awareness	Cognitive Autonomy and Self-Evaluation
Self-Awareness	Coopersmith's Self-Esteem Inventory (Self-Esteem)
Self-Awareness	Group Environment Questionnaire (Attraction to Group-Task)
Self-Awareness	Measurement of Social Empowerment and Trust (Self-Awareness)
Self-Awareness	Peer Experiences Questionnaire
Self-Awareness	Piers-Harris Children's Self-Concept Scale (Anxiety)
Self-Awareness	Piers-Harris Children's Self-Concept Scale (Happiness and Satisfaction)
Self-Awareness	Piers-Harris Children's Self-Concept Scale (Overall)
Self-Awareness	Piers-Harris Children's Self-Concept Scale (Physical Appearance and Attributes)
Self-Awareness	Potency Scale
Self-Awareness	Rosenberg Self-Esteem Scale for Adolescents
Self-Awareness	Self-Perception Profile for Adolescents (Global Self-Worth)
Self-Awareness	Self-Perception Profile for Adolescents (Romantic Appeal)
Self-Awareness	Social Anxiety Scale for Adolescents
Self-Awareness	Social Self-Efficacy Scale
Self-Awareness	Sport Orientation Questionnaire (Competitiveness)
Self-Awareness	Student Self-Concept Scale (Self-Image)
Self-Awareness	Teacher-Child Rating Scale (Shy/Anxious)
Self-Awareness	Youth Self-Report (Depression)
Self-Management	Beck Youth Inventory (Disruptive Behaviors)
Self-Management	Child Rating Scale (Rule Compliance/Acting Out)
Self-Management	Classroom Environment Scale (Personal Dimensions)
Self-Management	Group Environment Questionnaire (Group Integration-Task)
Self-Management	Life Effectiveness Questionnaire (Achievement Motivation)
Self-Management	Life Effectiveness Questionnaire (Emotional Control)
Self-Management	Life Effectiveness Questionnaire (Social Competence)
Self-Management	Life Effectiveness Questionnaire (Task Leadership)
Self-Management	Marsh's Self-Description Questionnaire II (Honesty and Trustworthiness)
Self-Management	Marsh's Self-Description Questionnaire II (Opposite Sex Relationships)
Self-Management	Marsh's Self-Description Questionnaire II (Physical Ability)
Self-Management	Marsh's Self-Description Questionnaire II (Same Sex Relationships)
Self-Management	Measurement of Social Empowerment and Trust (Affirmations)

Table 1 cont'd

<i>CASEL Competency</i>	<i>Construct in Study</i>
Self-Management	Measurement of Social Empowerment and Trust (Empowerment)
Self-Management	Nowicki Strickland Internal/External Control Scale (Locus of Control)
Self-Management	Piers-Harris Children's Self-Concept Scale (Behavior)
Self-Management	Risk-Taking Subscale of Jackson Personality Inventory
Self-Management	Scales from Student Questionnaire (Autonomy)
Self-Management	Self-Perception Profile for Adolescents (Athletic)
Self-Management	Self-Perception Profile for Adolescents (Behavioral Conduct)
Self-Management	Sport Orientation Questionnaire (Goal)
Self-Management	Sport Orientation Questionnaire (Win)
Self-Management	Student Self-Concept Scale (Academic)
Self-Management	Teacher-Child Rating Scale (Acting Out)
Self-Management	Teacher-Child Rating Scale (Frustration Tolerance)
Self-Management	Teacher-Child Rating Scale (Learning Problems)
Self-Management	Teacher-Child Rating Scale (Task Orientation)
Social Awareness	Classroom Environment Scale (Relationships Dimensions)
Social Awareness	Classroom Environment Scale (Systems Dimensions)
Social Awareness	Coppersmith Self-Esteem Inventory School Form (Home)
Social Awareness	Coppersmith Self-Esteem Inventory School Form (School)
Social Awareness	Coppersmith Self-Esteem Inventory School Form (Social)
Social Awareness	Group Environment Questionnaire (Attraction to Group-Social)
Social Awareness	Group Environment Questionnaire (Group Integration-Social)
Social Awareness	Measurement of Social Empowerment and Trust (Awareness of Others)
Social Awareness	Piers-Harris Children's Self-Concept Scale (Intellectual and Social Status)
Social Awareness	Piers-Harris Children's Self-Concept Scale (Popularity)
Social Awareness	Scales from Student Questionnaire (Community)
Social Awareness	Self-Perception Profile for Adolescents (Physical Appearance)
Social Awareness	Self-Perception Profile for Adolescents (Social Acceptance)
Social Awareness	Student Self-Concept Scale (Social)
Social Awareness	Unpopular Scale
Relationship Skills	Aggressive Scale
Relationship Skills	Child Rating Scale (Peer Social Skills)
Relationship Skills	Measurement of Social Empowerment and Trust (Bonding/Cohesion)
Relationship Skills	Scales from Student Questionnaire (Support)
Relationship Skills	Self-Perception Profile for Adolescents (Close Friendship)
Relationship Skills	Social Skills Questionnaire
Relationship Skills	Social Support Scale for Children and Adolescents
Relationship Skills	Teacher-Child Rating Scale (Assertive Social Skills)
Relationship Skills	Teacher-Child Rating Scale (Peer Social Skills)
Responsible Decision Making	Child Rating Scale (School Interest)
Responsible Decision Making	Delinquent Scale
Responsible Decision Making	Knowledge of ATOD Test

Table 1 cont'd

<u><i>CASEL Competency</i></u>	<u><i>Construct in Study</i></u>
Responsible Decision Making	No repeat arrest Year1 (Legacy-OSP)
Responsible Decision Making	No repeat arrest Year1 (Legacy-YDC)
Responsible Decision Making	No repeat arrest Year2 (Legacy-OSP)
Responsible Decision Making	No repeat arrest Year2 (Legacy-YDC)
Responsible Decision Making	No repeat arrest Year3 (Legacy-OSP)
Responsible Decision Making	No repeat arrest Year3 (Legacy-YDC)
Responsible Decision Making	Self-Perception Profile for Adolescents (Job)
Responsible Decision Making	Self-Perception Profile for Adolescents (Scholastic)

Table 2. List of outcome studies for meta-analysis.

StudyID	Year	Reference
1	1989	McDonald, R. G., & Howe, C. Z. (1989). Challenge/initiative recreation programs as a treatment for low self-concept children. <i>Journal of Leisure Research</i> , 21(3), 242-253.
2	1989	Wisnyai, M. (1989). The effects of an integrated outdoor adventure experience on the risk taking attitudes of high school students (Doctoral dissertation, The Ohio State University, 1988). <i>Dissertation Abstracts International</i> , 50(11), 5306B.
3	1993	Moreau de la Meuse, N. (1993). Selected psychological effects of Tae Kwon Do and a ROPES course on middle school students (Doctoral dissertation, The University of Texas at Austin, 1992). <i>Dissertation Abstracts International</i> , 53(7), 2302A.
4	1997	Aghazarian, T. L. (1997). Use of a challenge course as an intervention tool to adolescent self-esteem (Masters thesis, San Jose State University, 1996). <i>Masters Abstracts International</i> , 35(03), 908.
5	1998	White, F. E., Jr. (1998). The long-term effects of a nine-week challenge initiative program on locus of control and self-esteem of fourteen- to eighteen-year-old youth (Doctoral dissertations, The University of Utah, 1997). <i>Dissertation Abstracts International</i> , 58(08), 4178B.
6	1999	Daheim, T. J. (1999). Effects of ropes course therapy on individual perceptions of the classroom environment (Doctoral dissertation, Oklahoma State University, 1998). <i>Dissertation Abstracts International</i> , 60(02), 854B.
7	1999	McDaniel, P. E. (1999). Benefits of a ROPES program in working with at-risk youth's self-concept (Doctoral dissertation, St. Mary's University of San Antonio, 1999). <i>Dissertation Abstracts International</i> , 59(12), 4370A.
8	2000	Eagle, H. A. (2000). Long-term differences between participant and non-participants in "Beyond the Limits" adventure education program (Doctoral dissertation, University of Maryland College Park, 1999). <i>Dissertation Abstracts International</i> , 60(12), 4363A.
9	2000	Meyer, B. B. (2000). The ropes and challenge course: A quasi-experimental examination. <i>Perceptual and Motor Skills</i> , 90(3, pt 2), 1249-1257.
10	2001	Talbot, P. A. (2001). An evaluation on the impact of adventure-based educational program on the self-esteem and academic achievement of adolescents at risk (Master's thesis, California State University, 2000). <i>Masters Abstracts International</i> , 39(02), 331.
11	2001	Vasquez, L. M. (2001). The effects of an experiential-based prevention education program on alcohol, tobacco, and other drugs knowledge, and social attitudes and skills on first-time offender, non-adjudicated youth (Doctoral dissertation, University of Southern Mississippi, 2000). <i>Dissertation Abstracts International</i> , 62(01), 114A.
12	2003	Horak, R. A., Jr. (2003). The impact of adventure-based counseling on middle school climate (Doctoral dissertation, University of South Carolina, 2003). <i>Dissertation Abstracts International</i> , 64(03), 796A.
13	2004	McGarvey, A. L. (2004). An evaluation of a ropes course: Efficacy for at-risk youth with externalizing versus internalizing symptoms (Doctoral dissertation, The University of Connecticut, 2003). <i>Dissertation Abstracts International</i> , 64(12), 6334B.

Table 2 cont'd

<u>StudyID</u>	<u>Year</u>	<u>Reference</u>
14	2006	Jelalian, E., Mehlenbeck, R., Lloyd-Richardson, E. E., Birmaher, V., & Wing, R. R. (2006). Adventure therapy combined with cognitive behavioral treatment for overweight adolescents. <i>International Journal of Obesity</i> , 30, 31-39.
15	2007	Larson, B. (2007). Adventure camp programs, self-concept, and their effects on behavioral problem adolescents. <i>Journal of Experiential Education</i> . 29(3) 313-330. DOI:
16	2009	Frank, D. (2009). Reducing stress in adolescent girls through Outdoor Experiential Education. Prescott College. Doctoral Dissertation.
17	2010	Gillis, H. L., Gass, M. A. (2010). Treating juveniles in a sex offender program using adventure-based programming: A matched group design. <i>Journal of Chile Sexual Abuse</i> . 19:20-34. DOI: 10.1080/10538710903485583
18	2011	Jelalian, E., Sato, A., Hart, C. N. (2011). The effect of group-based weight-control intervention on adolescent psychosocial outcomes: Perceived peer rejection, social anxiety, and self-concept. <i>Children's Health Care</i> . 40: 197-211. DOI: 10.1080/02739615.2011.590391
19	2013	Allsop, J. (2012). Assessing the social effects of a therapeutic recreation summer camp for adolescents with chronic illness. The University of Utah. Masters Thesis.
20	2014	Margalit, D., Ben-Ari, A. (2014). The effect of wilderness therapy on adolescents' cognitive autonomy and self-efficacy: Results of a non-randomized trial. <i>Child Youth Care Forum</i> . 43:181-194. DOI:10.1007/s10566-013-9234-x

Table 3. Summary of descriptive variables.

Variable	Number of Studies	Percent of Studies	Mean d	Number of d	Percent
<u>Type of Publication</u>					
<i>Peer-Reviewed Article</i>	8	40	0.51	50	34
<i>Dissertation/Thesis</i>	12	60	0.13	99	66
<u>Focus of Program</u>					
<i>Therapeutic</i>	9	45	0.49	52	35
<i>Developmental</i>	1	5	0.98	6	4
<i>Educational</i>	10	50	0.07	91	61
<u>Activity</u>					
<i>High Ropes</i>	1	5	0.77	2	1
<i>Low Ropes</i>	11	55	0.35	70	47
<i>High and Low Ropes</i>	8	40	0.14	71	48
<u>Gender</u>					
<i>Mixed</i>	16	80	0.18	127	85
<i>Male</i>	2	10	0.99	10	7
<i>Female</i>	2	10	0.43	12	8
<u>Race Ethnicity</u>					
<i>Unreported</i>	8	40	0.48	47	32
<i>Multiple</i>	10	50	0.07	89	60
<i>African American</i>	1	5	0.98	6	4
<i>Caucasian</i>	1	5	0.53	7	5
<u>Grades</u>					
<i>3rd - 12th</i>	2	10	0.30	8	5
<i>6th - 8th</i>	5	25	-0.02	54	36
<i>6th - 12th</i>	7	35	0.47	46	31
<i>9th - 12th</i>	6	30	0.36	41	28
<u>Program Hours</u>					
<i>Not Reported</i>	8	40	0.23	59	40
<i>≤8</i>	5	25	0.17	42	28
<i>9-20</i>	3	15	0.18	23	15
<i>≥21</i>	4	20	0.53	25	17
<u>Total Samples</u>					
<i>Experimental</i>	704	50			
<i>Control</i>	697	50			

Table 4. Summary of outcome variables by study.

Study	Mean d	Number of ES	Grade Range	Experimental n	Control n	CASEL Competencies
McDonald, R. G., & Howe, C. Z. (1989)	0.80	7	6-12	18	20	SelfA, SelfM
Wisnyai, M. (1989)	0.77	2	9-12	15	17	SelfM
Moreau de la Meuse, N. (1993)	0.05	5	6-8	23	53	SelfA, SocialA, RS, RDM
Aghazarian, T. L. (1997)	0.07	18	9-12	17	23	SelfA, SelfM, SocialA, RS, RDM
White, F. E., Jr. (1998)	0.36	4	6-12	12	12	SelfA, SelfM
Daheim, T. J. (1999)	0.10	6	6-8	110	86	SelfA, SelfM
McDaniel, P. E. (1999)	0.22	6	9-12	22	20	SelfA, SelfM
Eagle, H. A. (2000)	-0.05	8	6-8	74	64	SelfA, SelfM
Meyer, B. B. (2000)	0.53	7	9-12	16	19	SelfA, SelfM
Talbot, P. A. (2001)	0.19	4	9-12	30	26	SelfA, SocialA
Vasquez, L. M. (2001)	0.98	6	6-12	10	11	SelfA, SelfM, SocialA, RS, RDM
Horak, R. A., Jr. (2003)	0.10	3	6-8	51	54	SelfA, SelfM, RS
McGarvey, A. L. (2004)	-0.05	32	6-8	29	15	SelfA, SelfM, SocialA, RS, RDM
Jelalian, E., Mehlenbeck, R., Lloyd-Richardson, E. E., Birmaher, V., & Wing, R. R. (2006)	0.82	4	6-12	37	39	SelfA, RS
Larson, B. (2007)	0.24	6	3-12	31	30	SelfA, SelfM, SocialA
Frank, D. (2009)	0.29	5	6-12	8	8	SelfA, SelfM
Gillis, H. L., Gass, M. A. (2010)	0.45	6	6-12	95	95	RDM
Jelalian, E., Sato, A., Hart, C. N. (2011)	0.03	14	6-12	45	44	SelfA, SocialA, RS
Allsop, J. (2012)	0.47	2	3-12	40	32	SelfA, RS
Margalit, D., Ben-Ari, A. (2014)	1.81	4	9-12	21	29	SelfA

Table 5. Summary of outcome variables by CASEL Social Emotional Learning Core Competencies.

CASEL Competency	Number of Studies	Percent of Studies	Mean d	Number of d	Percent
Self-Awareness	15	75	0.41	50	34
Self-Management	13	65	0.13	40	27
Social Awareness	12	60	0.21	30	20
Relationship Skills	8	40	0.11	15	10
Responsible Decision-Making	5	25	0.33	14	9

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