

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/312121478>

Indoor competition climbing as a context for positive youth development

Article · November 2016

DOI: 10.5195/jyd.2016.444

CITATIONS

0

READ

1

3 authors, including:



Barry A Garst

Clemson University

50 PUBLICATIONS 210 CITATIONS

[SEE PROFILE](#)



Ryan Gagnon

Clemson University

18 PUBLICATIONS 9 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



A Formative Evaluation of the “Resiliency and Reintegration in Military Youth” Project [View project](#)

All content following this page was uploaded by [Barry A Garst](#) on 06 January 2017.

The user has requested enhancement of the downloaded file. All in-text references [underlined in blue](#) are added to the original document and are linked to publications on ResearchGate, letting you access and read them immediately.

Indoor Competition Climbing as a Context for Positive Youth Development

Barry A. Garst

College of Behavioral, Social and Health Sciences
Clemson University
bgarst@clemson.edu

Garrett A. Stone

College of Behavioral, Social and Health Sciences
Clemson University
gastone@clemson.edu

Ryan J. Gagnon

College of Behavioral, Social and Health Sciences
Clemson University
rjgagnon@clemson.edu

Abstract: Climbing as a competitive youth sport is rapidly expanding in both participation and popularity as it has transitioned from an unorganized recreational activity to a formalized sport with a national governing body, organized competitions, formal coaching, and team structure. In spite of this growth, little to no research has been conducted regarding indoor competition climbing as a developmental experience for youth. This study examined the contributions of indoor competition climbing to youth development outcomes based on qualitative responses collected from 623 parents and climbers (youth and adults) in late Fall 2014. Themes were constructed related to climbing as a youth development experience, including: holistic development; supportive relationships; confidence and self-efficacy; and sportsmanship and character development. Holistic development, which included growth in the areas of strength and health, cognition and mental conditioning, and social skills, appears to be a hallmark of the sport of indoor competition climbing. The identified themes mapped well to the 5Cs model of positive youth development (PYD), providing evidence for the existence of the 5Cs among youth who play sports. In response to calls for intentionality in youth programming, future research examining underlying programming, coaching, and parenting mechanisms that contribute to PYD is recommended.

Background

Sports-Based Positive Youth Development

With 60 million U.S. youth participating in organized sports annually (National Council of Youth Sports, 2008), there has been considerable interest in the relationship between sport participation and positive youth development (PYD). Sports-based youth development models align supportive orientations and actions from peers, parents, coaches, and administrators with growth opportunities available as a result of the contexts under which sport participation occurs (Coakley, 2011; Holt & Neely, 2011). Research has examined characteristics of sport activities that may contribute to youth development. These impactful characteristics include time spent participating in sports each week (i.e., intensity), participation stability and duration across adolescence (i.e., continuity), and time spent in other types of activities in addition to sports (i.e., variety) contribute to the link between sports participation and youth development (Zarrett et al., 2007).

Researchers have categorized the benefits of sports participation for youth using physical, social, psychological/emotional, and intellectual development as a framework (Fraser-Thomas, Côté, & Deakin, 2005). Although frameworks like this have positioned sport as a viable mechanism for enhancing developmental outcomes, empirical support for the developmental benefits of organized sports for youth has been mixed (Coakley, 2011; Nicholls, Giles, & Sethna, 2010). Coakley (2011) noted the unsupported assumptions that often undergird youth development and sports, including the *fertilizer effect* [i.e., if sport is “tilled into their experiences, their character and potential will grow” (p. 308)] and the *guardian angel effect* [i.e., sport will “guide young people in success-oriented and civic-centered directions through their lives” (p. 309)]. Due to these assumptions, Coakley (2011) proposed that simply participating in youth sport would produce no identifiable developmental outcomes.

Table 1
Benefits of Youth Sport Participation

Mechanism	Outcome	Citations
Physical Development	cardiovascular fitness, weight control, improved muscular strength, muscular endurance, flexibility, bone structure, and healthy habits	Aaron et al., 1995; Taylor, Sallis, & Needle, 1985; Wankel & Berger, 1990
Social Development	citizenship, cooperation, social success, responsibility, positive peer relationships, leadership skills, empathy, intergroup relations, community integration, social status, and social mobility	Côté, 2002; Elley & Kirk, 2002; Evans & Roberts, 1987; Wankel & Berger, 1990; Wright & Côté, 2003
Psychological/Emotional Development	challenge, fun, happiness, enjoyment, and overall sense of well-being	Csikszentmihalyi, 1975; Long, 1985
Intellectual Development	academic performance, school grades, school attendance, course choice, time spent on homework, higher education aspirations, and college attendance	Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001; Eccles & Barber, 1999; Marsh, 1993; Snyder & Spreitzer, 1990; Whitley, 1999

While the benefits of youth sport participation have interested sport researchers for some time, research supporting the benefits of sport within the framework of PYD only emerged in the early 2000s (Fraser-Thomas, Côté, & Deakin, 2005). The most contemporary PYD framework has been operationalized by the "5Cs" (i.e., competence, confidence, connection, caring, and character) (Lerner et al., 2005). A key hypothesis of the 5Cs model is that if the strengths of youth are positioned with family, school, and community resources, then a young person's healthy development may be optimized (Lerner, 2004).

Scholars have noted the need to examine the empirical validity of PYD within sports contexts (Jones, Dunn, Holt, Sullivan, & Bloom, 2011). Specifically, Jones (Jones et al., 2011) called for testing of proposed PYD models to verify their conceptual and statistical reliability and validity and to some extent this work has begun. For example, extensive testing of the 5Cs model of PYD by Lerner (Lerner et al., 2005) to establish empirical evidence for the theoretical relationship between PYD, youth contributions, and reduced involvement in risky behaviors appeared to result in an excellent fitting model (Jones et al., 2011). However, the researchers noted the substantial amount of conceptual overlap among factors in Lerner et al.'s PYD model. Further testing of the 5Cs model by Phelps et al. (2009) resulted in good fitting models for a sample of youth in grades 5, 6, and 7, with strong support for the 5Cs and a second-order factor that reflected PYD, but the researchers did not provide inter-factor correlations for their models so the degree of conceptual overlap could be evaluated (Jones et al., 2011). In a study designed to examine the 5Cs model, Jones et al. (2011) instead found that PYD in sport might be comprised of two factors reflecting pro-social values and confidence/competence.

With concerns about the empirical validity of PYD in sports contexts in mind, researchers have suggested that the manifestation of PYD within sport may differ when compared with other youth settings. Jones et al. (2011) proposed that "sport is a unique achievement context that likely involves different levels of emotional involvement than the school settings and after-school clubs" (p. 253-254) studied by other researchers. Furthermore, Jones et al. (2011) proposed that some dimensions of sports participation may weaken PYD. For example, Hansen and Parker (2009) found that sports participation was also associated with negative peer interactions and inappropriate adult behavior. To better understand factors that influence sports-based positive youth development, both positively and negatively, it is important to explore PYD models across a variety of sport settings.

Indoor Competition Climbing

Indoor competition climbing (ICC) has emerged as a promising sport for promoting PYD outcomes, with significant growth over the past 20 years including a rapid expansion of climbing walls in both elementary schools and commercial facilities (Baláš, Strejcová, Malý, Malá, & Martin, 2009). Although roughly 1.2 million youth between the ages of 6 and 17 participate in climbing (The Outdoor Foundation, 2013), few studies have empirically examined the PYD outcomes associated with ICC participation. While researchers have studied climbing as a recreational pursuit, prior research has most often examined the physical and physiological impacts of climbing (Morrison & Schöffl, 2007), climbing motivations (Ewert, 1985; Ewert, 1994), self-determination and climbing identity formation (Kiewa, 2001), perceptions of climbing management (Schuster, Thompson, & Hammitt, 2001), physiological responses to rock climbing in young climbers (Morrison & Schöffl, 2007), social worlds associated with climbing (Kurten, 2009), and climbing as a lifestyle sport (Gagnon, Stone, Garst, & Arthur-Banning, 2016).

The only published study that explicitly examined climbing through a PYD lens was conducted by Hansen and Parker (2009). The researchers examined how a school physical education program for youth ages 10-14—that incorporated indoor and outdoor climbing—might be designed to provide PYD. This was not an empirical study, however, and PYD was not measured, so the influence of the curriculum on changes in PYD is unknown. Although they referenced the 5Cs model, they failed to provide a theory of change outlining the program's logic from goals to implementation to PYD outcomes. They noted that the curriculum, activities, and atmosphere were necessary for PYD, and suggested that it is important to consider how each component is delivered in relationship to the other. Considering the limited evidence supporting climbing as a mechanism for PYD, and the lack of a robust literature applying and empirically investigating PYD within the context of indoor climbing (specifically), the purpose of this study was to explore ICC as a PYD experience based on the perspective of climbers (youth and adult) and parents of youth climbers.

Methods

This qualitative study was part of a larger study investigating the economic, social, and organizational aspects of ICC. The research team, in partnership with USA Climbing (USAC), the governing body for U.S. competition climbing, administered a 79-item electronic survey to the USAC membership. Respondents were recruited via social media (Facebook) and email (through USACs member list) and responses were anonymized through Qualtrics. This anonymization combined with the non-sensitive nature of questions provided the impetus for the authors' Institutional Review Board (IRB) to allow for youth data to be collected without the need for signature of parents. An incentive for survey completion was entry in a raffle to win \$250 worth of free climbing equipment. These strategies resulted in 986 unique clicks on the survey link, of those potential respondents 623 respondents completed the survey resulting in a 63 percent response rate.

Data Sources and Procedures

The survey collected demographic information, economic impact data, and short answer questions relating to climbing behavior, organizational culture, and perceptions of the sport of climbing. The primary data point for this paper was the question "How does ICC contribute to positive youth development?" Other data points were excluded from this analysis due to lack of relevance with the research question being investigated for this paper.

Sample

Of the 948 respondents 623 answered the short answer survey question. The majority of respondents were White (86.5%), with 28 respondents reporting as Asian (4.5%), 26 reporting as Multiple Race (4.2%), and the remaining respondents (1.1%) reported as Black, African American, Native American, Indian (East Asian), or Pacific Islander. The sample was fairly evenly split by gender with 326 males (52.8%) and 297 female (47.2%) responding to the survey question.

The average age of respondents was 34.5 years ($SD = 14.33$; $Median = 34$ years) with ages ranging from 11 years to 70 years-old. Approximately 12 percent of the respondent sample was comprised of "youth" members (19 and under) indicating the sample was primarily non-youth, however, to understand if there were any differences in thematic patterns between youth (19

years old and under) and non-youth (20 years old and over) respondents, we conducted a multinomial logistic regression using youth status as a predictor of theme membership. Youth and non-youth status was determined by USAC's differing levels of competition where youth comprise the 19 and under category and adults comprise the 20 and older category (USA Climbing, 2014). The regression was not statistically significant, indicating no difference in response to the question based on youth status (chi square = .623, $p = .371$, $df = 1$). This suggests that while the majority of the sample were adults, the findings were not statistically different between youth and adult responses.

Survey respondents were also asked several questions about their climbing experience and abilities. Respondents indicated an average of 12.69 climbing days per month ($SD = 6.31$ days), and an average of 7.53 years of climbing experience ($SD = 7.46$ years). Respondents climbed primarily indoors 86.6 percent ($n = 657$), with 8.4 % ($n = 64$) reporting climbing primarily outdoors, and 5 percent reporting an even split between indoor and outdoor climbing. In order to understand if respondents responded differently based on their primary climbing location to the question "How does ICC contribute to positive youth development?" we conducted a multinomial logistic regression. The non-significant results demonstrate that primary climbing location did not indicate between-group differences (chi square = 4.823, $p = .776$, $df = 8$) in terms of response to the question.

Data Analysis

Data were exported from Qualtrics into a spreadsheet for analysis. Each researcher used conventional content analysis (Hseih & Shannon, 2005) to independently code the qualitative responses, highlighting keywords and developing separate topics from the data based on frequency and/or salience (Buzan & Buzan, 1995). After initial topics were identified, a collaborative coding process ensued, aimed at identifying patterns, meanings, and trends, which allowed the researchers to arrive at the four main themes (Strauss & Corbin, 1998). An inductive approach was used, allowing the data to point us to broader generalizations and theory (Strauss & Corbin, 1998).

Trustworthiness procedures included the development of an audit trail, researcher reflection to acknowledge and minimize bias (Lincoln & Guba, 1985) as well as the use of an inter-coder reliability rating (Lombard, Snyder-Duch, & Bracken, 2002). First, an audit trail was established, documenting the rationale for reductions made from raw data to codes, which were then reduced to themes (Denzin & Lincoln, 2000). This process resulted in an analytic codebook that included clear descriptions of each theme and its codes as well as exemplar quotes (MacQueen, McLellan, Kay, & Milstein, 1998). When the coding process was completed, the codebook was used to reanalyze the data and ensure the themes were representative, mutually exclusive, and exhaustive. Second, reflexivity was established through scheduled meetings with all members of the research team. During these meetings, research team members adopted the role of devil's advocate, challenging rationale and reinforcing a system of checks and balances that minimized the intrusion of personal bias. Where rationale was weak, the team revisited the data to ensure that the themes represented the respondents' perspectives and not those of the researchers. Finally, a percent agreement strategy was used to establish an inter-coder reliability score. Agreement between the three members of the research team was approximately .921, which exceeded the acceptable level of .90 (Lombard, Snyder-Duch, & Bracken, 2002).

Results

Four themes were developed through the qualitative analysis that describe contributions and contributors to PYD including: holistic development; supportive relationships; confidence and self-efficacy; and sportsmanship and character development (see Table 2 for the frequencies and percentages). Representative quotes were selected for each theme and are reflected as they were expressed by participants, including misspellings.

Table 2

Developmental Outcomes of Climbing Mapped to the 5Cs Model of PYD (N=623)

The 5Cs Model of Youth Development	Themes Associated with Indoor Competition Climbing as a Developmental Experience*	Theme Frequency
Competence	Holistic development (physical, cognitive, social)	254 (40.8%)
Connection & Caring	Supportive, caring relationships with peers and adults	183 (29.4%)
Confidence	Confidence and self-efficacy	124 (19.9%)
Character	Sportsmanship and character	45 (7.2%)

* Note: Dissenting accounts accounted for 2.7% ($n = 17$) of sample

Theme #1: Competition Climbing Contributed to Holistic development

Respondents indicated that indoor competition climbing contributes to holistic development, or development that treats the whole person, as evidenced by gains experienced across developmental domains (e.g., physical, mental, social, and spiritual). Often, these domain-specific benefits were reportedly experienced in tandem with, or inseparable from one another. For example, references to physical development associated with participating in indoor climbing often occurred in conjunction with gains in mental cognition. Three subtopics were identified to illustrate how competition climbing contributed to holistic development.

Holistic development produces well-rounded youth. Respondents expressed that climbing "gives opportunity for personal, physical, emotional, and spiritual growth." From this perspective, ICC provided a space for socio-emotional and spiritual development—developmental domains missing from the PYD and climbing literature. Holistic gains also allowed for a better outcome—a more complete or polished individual—as indicated by the following statement: "There's no sport I can think of that requires more, physically and mentally, than climbing, which equates to a very well rounded individual."

Physical and cognitive development occurred for youth of varying cognitive abilities. While there is evidence that ICC contributes to holistic development, there was strong agreement across participants that ICC more frequently contributed to physical fitness and cognitive development. Respondents indicated that they had become more aware of their physical capabilities as a result of participation in competition climbing. They also described the sport as a means of developing healthy fitness habits and avoiding risky behaviors, claiming "It makes kids aware of their bodies, provides exercise, and keeps them away from drugs and alcohol." Another

respondent described how body awareness gives youth an advantage over their peers, stating "personal fitness is great for self-esteem. In general, climbers are more physically aware and physically capable than their peers." These advantages seemed especially salient for female climbers, a sentiment captured in the following response: "For a pre-teen/young teen-aged girl, having the physical strength required for climbing is a huge confidence builder that transfers to all areas of her life." More than highlighting the role competition climbing played in promoting physical dexterity and strength, this response illustrates how physical development through climbing influenced other aspects of the individual identity and life.

Respondents described a number of ways in which ICC contributed to cognitive development. Participation in the sport improved focus and Attention Deficit Disorder management, reduced learning difficulties, and facilitated the development of skills such as problem solving, goal setting, and time management. One respondent said, "Being a 'youth,' I can say that it has taught me to focus better and motivate myself, which also applies to school." Another youth climber identified unique characteristics of the sport that may facilitate cognitive growth by sharing, "I think [indoor competition climbing] teaches you how to problem solve because you have to figure out every problem in a competition and the route setters are always trying to trick you with different sequences." Thus, cognitive stimulation appears to be an inherent attribute of competition climbing, and an important facilitator of this cognitive development is the opportunity to face and resolve problems while climbing.

Boundaries between cognitive and physical development are less distinct. Physical and mental domains were often paired in respondents' descriptions of the developmental impacts of climbing. For example, one youth respondent simply stated that the sport "helps [him/her] become stronger both physically and mentally." Frequently, the distinctions between benefits attributable to the body versus the mind were difficult to pinpoint. Of this effect, one participant said "Comp[etitive] climbing offers an unparalleled level of demand on all aspects of a person's mental and physical strength and development. Climbing shows us there is little boundary between mental and physical." From this perspective, the boundary between mental toughness and physical prowess is integrated, such that the two domains work in synchrony.

Overall, while climbing was predominately described as a body and mind sport, promoting physical and mental health, it ultimately served the purpose of creating well rounded youth and promoting healthy lifestyles rather than just promoting skill development and strength training. Regardless, respondents seemed to become more aware of and develop mastery of their whole selves through participation in climbing.

Theme #2: Supportive Relationships Contributed to a PYD in the Climbing Context

Respondents indicated that indoor competition climbing has a uniquely supportive social environment marked by caring peers and adults and opportunities for interpersonal connection. The common vernacular employed by respondents suggests competition climbing is "unlike any other team sport," a quality they associated with the dual nature of the sport as both individually and team-focused. Two subtopics were developed to highlight practices or characteristics, such as the dual nature of the sport, that seem to contribute to its socially supportive atmosphere.

An "us against the wall" mentality is shared. Respondents indicated that, more often than not, participants compete against the wall or the routes and route setters, not each other. In this

way, youth become committed to shared goals, and focus on encouraging individual performance rather than on directly competing against each other. This sentiment was embodied by the respondent who shared, "the climbing community is unique in the way that everyone encourages their competitors. At comps, we want our friends to get the routes or problems just as much as we want to get it ourselves." The same idea was illuminated in another respondent's reflection:

[The sport] is competitive, but you're competing more with yourself than you are with your peers. I don't know another sport where your direct competition is so supportive. Where your best friends compete with you and it only makes you closer. It challenges an individual to push themselves, think creatively, and value their decisions while forging friendships that will last a long time.

These quotes assert the idea that there is an interest in collective growth, shared success, and lasting connections among indoor competition climbers, as well as a balance between individuality and teamwork.

Both peer and adult role models were influential. The current structure of indoor climbing competitions allows youth to simultaneously compete with, and act as direct models for, both younger and older peers. This phenomenon was evidenced by this respondent comment: "having the wide range of ages helps kids help each other. They learn from the older kids ([who] have been wonderful role models) and in turn my daughter helps the younger kids." This structure supports positive peer modelling, collective learning, and a caring sport culture. In addition to peer modelling, coaches and parents also contributed to the culture of the sport. Of this, one respondent said, "with the right responsive and respectful coaching (rather than pushy and risk taking) this activity can help young people." Another respondent reaffirmed this point, stating "Like any other competitive sport, it is only as positive as the mentors and role models working with the kids." Implicit in these types of statements are two sentiments: (1) that coaches and mentors matter, and more importantly (2) that they *can be*, but are not *always* influential in positive ways.

Theme #3: Climbing Fostered Confidence and Self-Efficacy

Participation in ICC was largely viewed as a mechanism for increased confidence, improved self-esteem, and heightened self-efficacy. Confidence was typically linked with tangible skills such as self-control and self-discipline. Participation in the sport not only helped respondents recognize their capabilities, but also enhanced their overall sense of what they could accomplish.

Confidence was often connected to physical development, physical fitness and body image. This perception was especially true or explicit for female climbers. One female climber said climbing gives her a "self confidence boost...keeps [her] out of trouble, [provides a] home away from home...[and], as a female, especially made [her] one with [her] body." This sentiment was reaffirmed by parents of climbers who noted how strength and confidence were intertwined. One parent stated, "It is helping my girls be strong and confident. They love that they are as strong as or stronger than many of the boys they know. They love that they are able to compete and succeed at this stage in their lives." Overall, youth and adults both expressed that newfound confidence transferred to other facets of life or helped them to "excel in and out of the gym."

Theme #4: Sportsmanship and Character were Developed through the Competitive Climate

Respondents indicated that the atmosphere of healthy competition fostered by ICC facilitated sportsmanship behaviors and the development of personal character among climbers. Character traits such as a strong work ethic, determination, leadership, honesty, integrity, accountability, and responsibility were often cited. A quote from one of the respondent's best summarizes this finding:

[Competition climbing] teaches core values and promotes competition in a positive environment. Most climbers aren't out to get each other, they help each other and want their friends/teammates to succeed. But it teaches persistence, hard work, how to deal with defeat, how to deal with success. Climbers tend to be consumed by the sport and are often in the gym with their team as opposed to getting into trouble some place....

As evidenced by this response, climbing was not only a contributor to sportsmanship and character, but also an avenue to help youth avoid getting into trouble. The sport also was seen as an outlet to relieve stress, an avenue to develop greater resilience and persistence, and as a setting where one could learn to deal with success and failure.

Resilience, perseverance, and persistence were the results of participation. Respondents indicated that the sport taught them about dedication, determination, and persistence. Climbing, according to one respondent, "teaches youth about commitment, the relationship between practice and progress and that there is no barrier that cannot be broken with effort and will." Furthermore, ICC offered opportunities for "creative problem solving" and taught participants how to "deal with stress and perform when it counts." Above all, the sport gave youth opportunities to fall, quite literally, and learn to get back on the wall, while also helping others get back on the wall along the way. Falling allowed youth to develop the ability to navigate successes and failures with confidence, grace, and poise. This resulted in "learning to understand defeat, finding the grace in success, [and] understanding the role of perseverance."

Alternative Perspectives

While the majority of respondents expressed that competition climbing contributes positively to youth development, some individuals did take a neutral or opposing stance, suggesting that ICC participation can also have negative impacts. Giving voice to these dissenting accounts (Maxwell, 2005) may reveal emergent trends that could negatively affect ICC sport culture and enhance barriers to entry to the sport. Dissenting accounts pointed to the potential for injury, the hyper focus on individuality, and the over-competitive nature of the sport as inhibitors to PYD. Several respondents called for specific organizational-level changes at competitions, such as the restructuring of age brackets or team structures. Interestingly, a few respondents positioned themselves on the opposite end of the spectrum regarding the social culture of the sport as well. Rather than seeing it as supportive and caring like the majority of their peers, they perceived the sport to be exclusionary. This viewpoint is best represented by the following quote:

The teams are too competitive and there is little room for a skilled climber who has does not want to compete at the top level. The only team in the area... systematically shut[s] out kids who are not willing to train at the highest level. The coaches ignore the kids who are not the best and the other parents belittle kids who do not compete as well as their kids.

It is clear from this response that not all respondents had positive experiences within the competition climbing social world, nor believed that competition climbing contributed to PYD. The actions of coaches, parents, and teams, as well as the over competitiveness of the sport, may contribute to physical injury, socio-emotional distancing, and disappointing sport experiences.

Discussion

The uncovered themes strongly convey that the current supportive environment of ICC contributes to PYD for USAC members. Furthermore, while the present study was exploratory in nature and the underlying theory emerged from the data, the identified themes mapped well to the existing "5Cs" framework of PYD (see Table 2). Much has been written about the 5Cs of PYD (Bowers et al., 2010), therefore, the remainder of this discussion focuses on the aspects of ICC that broaden this discussion or contribute to the 5Cs model in novel ways.

Perhaps the strongest "C" reflected in the results was confidence, as respondent after respondent indicated a greater belief in himself/herself as a result of successfully navigating a difficult climb. This increase in feelings of self-worth and enhanced confidence and was not limited to efficacy associated with climbing. Competence, or the positive view of one's actions in domain-specific areas, was evident through respondents' expressions of the physical, cognitive, and social skills learned through climbing. Connection and caring were strongly indicated by the supportive peer-peer and peer-adult bonds as well as empathy towards others that emerged through the ICC experience. The establishment of an environment that supported healthy competition contributed to the strengthening of character traits such as honesty, accountability, responsibility, and a strong work ethic. Thus, climbing was about skill and accomplishment, but also about integrity.

Prior studies of PYD in sport have argued that there is no specific evidence for the existence of the 5Cs among youth who play sports, although some researchers have stressed the need to better understand how PYD may be deliberately influenced by coaches, parents, and sports organizations (Fraser-Thomas et al., 2005). This study's support for the 5Cs model appears to contradict findings that suggest that sports-based youth development may be better represented by a two-factor model than a model inclusive of the 5Cs (Jones et al., 2011). The only "C" not supported by this study was "contribution," which has been proposed as the sixth "C" in Lerner's 5Cs model (Lerner et al., 2005). The results of this study did not support that growth in competence, confidence, connectedness, compassion, and character associated with ICC would necessarily lead to increased contributions to one's home, school, or community. It may be that contribution is not an area of growth and development necessarily enhanced by ICC. However, it is possible that a longer-term examination of the influence of ICC on a young person's life might reveal such an impact.

Other noteworthy concepts were uncovered in addition to findings congruent with the 5Cs model. For example, respondents frequently stated their belief that climbing was unique when compared with traditional sports, in that competitors encourage one another and focus as much on the development of their peers as they do on personal success. This "us against the wall" mentality seemed counter to attitudes adopted by mainstream sport participants and represents a vital environmental strength of the sport, characteristic of the developmental assets and essential features requisite to PYD (Benson, 2003; Hershberg, Johnson, DeSouza, Hunter, &

Zaff, 2015). ICC also was viewed as an alternative sport where youth whose personalities and abilities did not align with the traditional sport model could thrive. Thus, ICC offers an alternative PYD-enhancing OST activity for youth who struggle to integrate into mainstream sports.

The exponential growth of ICC may provide youth and families with newfound awareness and access to climbing, resulting in increased youth participation and opportunities for PYD. However, the sport's growth may also introduce threats to PYD. For instance, while the current culture of ICC was generally viewed in a positive light, the individual and social benefits associated with participation may have been limited to long-time members or insiders, as a result of an exclusionary culture (noted in this study's findings) that was believed to be creeping into the sport. In other words, a mentality of "once you are in, you are in" was evident where insiders are embraced and outsiders are shunned. Thus, getting in (past the barriers to entry and exclusionary culture) at the start of one's integration into ICC may be challenging, especially for older youth who expect to compete at the same level against their younger peers who may be fully integrated into the sport. This reflects Hansen, Larson, and Dworkin's (2003) finding that sport may weaken PYD for certain groups of participants or would-be participants.

Implications

Holistic development in areas of strength and health, cognition and mental conditioning, and social skills, appears to be a hallmark of ICC. Providers should highlight this unique whole-body benefit to parents, providers, and the public. Moreover, the association of strength development and confidence through climbing, particularly for girls, and the influence of this relationship on girls' body image is compelling for program providers interested in developing programs to enhance adolescent girls' body image and sense of self. Many of the developmental benefits of ICC reflected important 21st century skills (Casner-Lotto, Barrington, & Wright, 2006), including work ethic, teamwork/collaboration, and critical thinking/problem solving. As previously noted, problem-solving appeared to be central to the ICC experience. There is evidence that problem solving skills are practiced and learned during the route preview process. Sanchez, Lambert, Jones, and Llewellyn (2012) examined pre-ascent climbing route visual inspection (route previewing) in indoor climbing and suggested that the ability to visually inspect a climb before its ascent may represent an essential component of performance optimization.

Future Directions

Youth sports advocates have been criticized for making generalizations about the outcomes of sport participation, while neglecting to clarify the underlying mechanisms through which these outcomes were achieved (Coakley, 2011). Although respondents in the present study alluded to underlying PYD mechanisms (e.g., supportive youth culture or "us against the wall" ethos), the connection between these mechanisms and related outcomes is still unclear. Thus, future research could build on these findings and identify how supportive sport cultures are developed toward PYD. While the lack of defined mechanisms may be, in part, due to the measurement approach employed in the present study, it is likely that ICC could also benefit from greater focus on sports programs intentionally designed to produce PYD outcomes. Coalter (2010) suggested that while certain factors may intuitively influence PYD, the most effective PYD experiences are intentionally designed and regularly evaluated.

Movement toward intentionality by competition organizers, trainers, and coaches may increase PYD impacts and the legitimacy of claims to this end. In addition, when trainers and coaches

are involved in efforts to intentionally promote PYD, parents may be more likely to associate ICC with PYD (Morrison & Schöffl, 2007). With the need for intentionality in mind, a few questions need to be addressed in future research and practice. For example, “How can program providers be more intentional and thus move towards the provision of supports and opportunities that are the hallmarks of PYD?” and “What is the role of adults (e.g., parents, coaches, mentors) in these experiences?” Although consistent and thoughtful approaches for coaching ICC have likely been developed, evaluations for these approaches have not been discussed in the literature, nor have the strategies of what a “good” climbing coach been formalized. Therefore, implementation issues associated with program delivery (i.e., dosage, program quality, competency, and fidelity (Berkel, Mauricio, Schoenfelder, & Sandler, 2011; Gagnon, Franz, Garst, & Bumpus, 2015) are areas of inquiry that can inform greater intentionality within the sport of ICC. Program providers need to better understand the optimal levels of climbing participation, characteristics of high-quality climbing programs, and indicators of competence for climbing coaches in order to maximize potential PYD outcomes of ICC.

Quantitative approaches may be useful for better understanding the relationship between youth involvement in ICC and growth in the 5C areas, as suggested by the findings in this study. Jones et al. (2011) pointed out the importance of examining the latent structure of PYD and the associated 5Cs in sport, because sport is a unique context that may involve different levels of emotional involvement than in other OST settings. The work of Geldhof, Bowers, and Lerner (2013) provides a good quantitative model for how the 5Cs could be explored within the context of a youth development experience. Empirical quantitative studies of the 5Cs within the context of specific sports from the perspective of parents and adults are needed.

Limitations

The study design introduced a number of limitations. First, the study findings are applicable to a targeted (yet still diverse) sample of indoor competition climbers. Although this study represents one of the few known investigations of PYD and ICC among the largest group of respondents, as a convenience sample there are limitations to how these results may actually represent the entire ICC community. Second, self-report has a number of inherent dangers, including: honesty/image management, lack of introspective ability, lack of understanding, and response bias (Austin, Gibson, Deary, McGregor, & Dent, 1998; Fan et al., 2006). However, due to the anonymous nature of the survey, this may have been mitigated. Third, there was no opportunity for follow-up to better understand respondents’ view on PYD. The survey was posted on the USA Climbing Facebook page such that the majority of respondents were likely members of USA Climbing. However, the link may have been re-distributed by members to nonmembers and there was no place within the survey to identify USAC membership. Thus, it is possible that some of the respondents were not USAC members. Fourth, respondents were not asked explicitly about how ICC was not a setting for PYD. However, respondents’ expressions of dissenting accounts suggest that the question wording did not inhibit that perspective. As noted by Maxwell (2005), presenting and analyzing dissenting accounts, as was done in this study, increases the descriptive, interpretive, and theoretical validity of qualitative findings.

ICC has much to offer youth, and the evidence provided by this study for the influence of the sport on PYD is compelling. Yet this was an exploratory study, a platform from which future research on climbing and PYD can emerge. Recognizing that maturity and happenstance can influence the developmental effects of youth programs, we know that there is much more to learn about how and under what conditions this unique sport may help young people thrive.

Acknowledgement:

The authors would like to thank USA Climbing and their executive director Kynan Waggoner for their assistance and support with this study.

References

- Aaron, D.J., Dearwater, S.R., Anderson, R.D., Olsen, T., Kriska, A.M., & Laport, R.E. (1995). Physical activity and the initiation of high-risk health behaviors in adolescents. *Medicine and Science in Sports and Exercise*, *27*, 1639–1645.
- Austin, E., Gibson, G., Deary, I., McGregor, M., & Dent, J.B. (1998). Individual response spread in self-report scales: Personality correlations and consequences. *Personality and Individual Differences*, *24*(3), 421–438.
- Baláš, J., Strejcová, B., Malý, T., Malá, L., & Martin, A. (2009). Changes in upper body strength and body composition after 8 weeks indoor climbing in youth. *Isokinetics & Exercise Science*, *17*(3), 173-179.
- Benson, P. (2003). Developmental assets and asset-building community: Conceptual and empirical foundations. In R.M. Lerner & P. Benson (Eds.), *Developmental assets and asset-building communities: Implications for research, policy, and practice* (pp. 19-44). Norwell, MA: Kluwer Academic Publishers.
- Berkel, C., Mauricio, A.M., Schoenfelder, E., & Sandler, I.N. (2011). Putting the pieces together: An integrated model of program implementation. *Journal of Prevention Science*, *12*(1), 23-33.
- Bowers, E.P., Li, Y., Kiely, M.K., Brittan, A., Lerner, J.V., & Lerner, R.M. (2010). The five Cs model of positive youth development: A longitudinal analysis of confirmatory factor structure and measurement invariance. *Journal of Youth and Adolescence*, *39*(7), 720-735.
- Buzan, T., & Buzan, B. (1995). *The Mind Map Book*. London: BBC Books.
- Casner-Lotto, J., Barrington, L., & Wright, M. (2006). *Are they really ready to work?: Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce*. Washington, DC: Conference Board, Inc., the Partnership for 21st Century Skills, Corporate Voices for Working Families, and the Society for Human Resource Management.
- Coakley, J. (2011). Youth sports: what counts as "positive development?" *Journal of Sports and Social Issues*, *35*(3), 306-324.
- Coalter, F. (2010). Sport-for-development: Going beyond the boundary? *Sport in Society: Cultures, Commerce, Media, Politics*, *13*(9), 1374-1391.
- Côté, J. (2002). Coach and peer influence on children's development through sport. In J.M. Silva & D.E. Stevens (Eds.), *Psychological foundations of sport* (pp. 520–540). Boston, MA: Allyn & Bacon.

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety: The experience of play in work and games*. San Francisco, CA, Jossey-Bass.

Denzin, N. & Lincoln, Y. (2000). *Handbook of qualitative research (2nd ed.)*. Thousand Oaks, CA: Sage.

Dwyer, T., Sallis, J. F., Blizzard, L., Lazarus, R., & Dean, K. (2001). Relation of academic performance to physical activity and fitness in children. *Pediatric Exercise Science, 13*(3), 225–238.

Eccles, J.S. & Barber, B.L. (1999). Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters? *Journal of Adolescent Research, 14*(1), 10–43.

Elley, D., & Kirk, D. (2002). Developing citizenship through sport: the impact of a sport-based volunteer programme on young sport leaders. *Sport, Education and Society, 7*(2), 151–166.

Evans, J., & Roberts, G.C. (1987). Physical competence and the development of children's peer Relations. *Quest, 39*(1), 25–35.

Ewert, A. (1985). Why people climb: The relationship of participant motives and experience level to mountaineering. *Journal of Leisure Research, 17*(3), 241-250.

Ewert, A. (1994). Playing the edge: Motivation and risk taking in high-altitude wilderness like environment. *Environment and Behavior, 26*(1), 3-24.

Fan, X., Miller, B.C., Park, K., Winward, B.W., Christensen, M., Grotevant, H.D., & Tai, R.H. (2006). An exploratory study about inaccuracy and invalidity in adolescent self-report surveys. *Field Methods, 18*(3), 223–244.

Fraser-Thomas, J., Côté, J., & Deakin, J. (2005). Youth sport programs: An avenue to foster positive youth development. *Physical Education & Sport Pedagogy, 10*(1), 19-40.

Gagnon, R.J., Franz, N., Garst, B., & Bumpus, M. (2015). Factors impacting program delivery: The importance of implementation research in Extension. *Journal of Human Sciences and Extension, 3*(2), 68-82.

Gagnon, R., Stone, G., Garst, B., & Arthur-Banning, S. (2016). Competition climbing: From leisure pursuit to lifestyle sport. *Journal of Unconventional Parks, Tourism, and Recreation Research, 6*(1), 2-12.

Geldhof, G.J., Bowers, E.P., & Lerner, R.M. (2013). Special section introduction: Thriving in context: Findings from the 4-H study of positive youth development. *Journal of Youth and Adolescence, 42*(1), 1-5.

Hansen, K., & Parker, M. (2009). Rock climbing: An experience with responsibility. *Journal of Physical Education, Recreation, and Dance, 80*(2), 17-55.

Hansen, D., Larson, R., & Dworkin, J. (2003). What adolescents learn in organized youth activities: A survey of self-reported developmental experiences. *Journal of Research on Adolescence*, *13*(1), 25-55.

Hershberg, R.M., Johnson, S.K., DeSouza, L.M., Hunter, C.J., & Zaff, J. (2015). Promoting contribution among youth: Implications from positive youth development research for youth development programs. In *Promoting Positive Youth Development* (pp. 211-228). Springer International Publishing.

Holt, N.L. & Neely, K.C. (2011). *Positive youth development through sport: A review*. New York, NY: Routledge.

Hsieh, H.F. & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277-88.

Jones, M., Dunn, J., Holt, N., Sullivan, P., & Bloom, G. (2011). Exploring the '5Cs' of positive youth development in sport. *Journal of Sport Behavior*, *34*(3), 250-267.

Kiewa, J. (2001). Control over self and space in rockclimbing. *Journal of Leisure Research*, *33*(4), 363-382.

Kurten, J. (2009). *Who are climbing the walls? An exploration of the social world of indoor rock climbing* (Unpublished masters thesis). Texas A&M University, College Station, TX.

Lerner, R.M. (2004). *Liberty: Thriving and civic engagement among America's youth*. Thousand Oaks, CA: Sage Publications.

Lerner, R.M., Lerner, J.V., Almerigi, J.B., Theokas, C., Phelps, E., Gestsdottir, S., et al. (2005). Positive youth development, participation in community youth development programs, and community contributions of fifth-grade adolescents findings from the first wave of the 4-H study of positive youth development. *Journal of Early Adolescence*, *25*(1), 17-71.

Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

Lombard, M., Snyder-Duch, J., & Bracken, C.C. (2002). Content analysis in mass communication: Assessment and reporting of intercoder reliability. *Human Communication Research*, *28*(4), 587-604.

Long, B. (1985). Stress-management interventions: A 15-month follow-up of aerobic conditioning and stress inoculation training. *Cognitive Therapy and Research*, *9*(4), 471-478.

MacQueen, K., McLellan, E., Kay, K., & Milstein, B. (1998). Codebook development for team-based qualitative research. *Cultural Anthropology Methods Journal*, *10*(2), 31-36.

Marsh, M. (1993). The effects of participation in sport during the last 2 years of high-school. *Sociology of Sport Journal*, *10*(1), 18-43.

Morrison, A.B., & Schöffl, V.R. (2007). Physiological response to rock climbing in young climbers. *British Journal of Sports Medicine*, *41*(2), 852-861.

National Council of Youth Sports. (2008). *Report on trends and participation in organized youth sports*. National Council of Youth Sports. Retrieved from <http://www.ncys.org/pdfs/2008/2008-ncys-market-research-report.pdf>

Nicholls, S., Giles, A.R., & Sethna, C. (2010). Perpetuating the 'lack of evidence' discourse in sport for development: Privileged voices, unheard stories and subjugated knowledge. *International Review for the Sociology of Sport*, doi: 1012690210378273.

Phelps, E., Balsano, A., Fay, K., Peltz, J., Zimmerman, S., Lerner, R.M., et al. (2007). Nuances in early adolescent development trajectories of positive and of problematic/risk behaviors: Findings from the 4-H Study of Positive Youth Development. *Child and Adolescent Clinics of North America*, *16*(2), 473-496.

Sanchez, X., Lambert, P., Jones, G., & Llewellyn, D.J. (2012). Efficacy of pre-ascent climbing route visual inspection in indoor sport climbing. *Scandinavian Journal of Medicine & Science in Sports*, *22*(1), 67-72.

Schuster, R., Thompson, J., & Hammitt, W. (2001). Rock climbers' attitude toward management of climbing and the use of bolts. *Environmental Management*, *28*(3), 403-412.

Snyder, E. & Spreitzer, E. (1990). High school athletic participation as related to college attendance among Black, Hispanic, and White males: a research note. *Youth and Society*, *21*(3), 390-398.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Sage Publications, Inc.

Taylor, C., Sallis, J., & Needle, R. (1985). The relation of physical activity and exercise to mental health. *Public Health Report*, *100*(2), 195-202.

The Outdoor Foundation. (2013). *2013 outdoor recreation participation report*. Retrieved from <http://www.outdoorfoundation.org/research.participation.2013.html>.

USA Climbing. (2014, December 29). *About us*. Retrieved from <http://www.usaclimbing.net>.

Wankel, L., & Berger, B. (1990). The psychological and social benefits of sport and physical activity. *Journal of Leisure Research*, *22*(2), 167-182.

Whitley, R. (1999). Those 'dumb jocks' are at it again: A comparison of the educational performances of athletes and nonathletes in North Carolina high school from 1993 through 1996. *High School Journal*, *82*(4), 223-233.

Wright, A. & Côté, J. (2003). A retrospective analysis of leadership development through sport. *The Sport Psychologist*, *17*(3), 268-291.

Zarrett, N., Lerner, R., Carrano, J., Fay, K., Peltz, J., & Li, Y. (2007). Variations in adolescent engagement in sports and its influence on positive youth development. In N.L. Holt (Ed.), *Positive youth development and sport* (pp. 9–23). Oxford, England: Routledge.

© Copyright of Journal of Youth Development ~ Bridging Research and Practice. Content may not be copied or emailed to multiple sites or posted to a listserv without copyright holder's express written permission. Contact Editor at: patricia.dawson@oregonstate.edu for details. However, users may print, download or email articles for individual use.
ISSN 2325-4009 (Print)