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Tough decisions in medical specialty camps: Relationships between camp dosage, outcomes, and camper attendance

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ABSTRACT

Rationale: Medical specialty camps play a significant role in the lives of the youth they serve. These camps have been found to improve self-determination in campers, to develop camper skills in managing a disability or coping with a diagnosis, and to provide campers with respite/escape from the challenges associated with their disability or diagnosis. Youth attending medical specialty camps are often funded through full or partial scholarships, mitigating a significant constraint to their participation. These resources are limited, leading camp administrators charged with allocating funding to make challenging decisions in determining which campers would most benefit from camp participation.

Objective: This study examines a factor often linked to the escalating achievement of outcomes, repeated camp attendance, in 217 youth (ages 10–16) attending a one-week residential summer "Type 1 diabetes" camp. Specifically, two research questions were examined using a structural equation model (SEM): (1) what effect does repeat camp attendance (returning for multiple years) have on targeted outcome achievement, and (2) how does camper age moderate the relationship between repeated camp attendance and outcomes?

Results: The study results indicate across the 10-outcomes tested in the study (e.g., relatedness, autonomy, competence), repeat attendance had no statistically meaningful effect ($p \leq .05$) on outcome scores, nor did camper age moderate the strength of relationship between attendance and outcomes.

Conclusion: The lack of relationship between attendance and outcomes supports prior meta-analyses suggesting the lack of value of repeated attendance, as does the non-significant moderational effect. The results of this study may illustrate to program providers and funders that no discernible benefit (in terms of targeted and measured outcomes in the current study) is due to repeat attendance, which can inform resource allocation and camper recruitment decisions.

1. Introduction

A strong body of evidence indicates residential summer camps can promote positive psychosocial, cognitive, and physical development for youth (Thurber et al., 2007). Correspondingly, investigation into camps serving youth with chronic illnesses and disabilities suggests these "medical specialty camps" can foster growth across the same domains as "mainstream camps" (Guest et al., 2017). While this similarity alone is substantive, there is also emerging support for medical specialty camps as a mechanism to *improve camper wellbeing* (Gillard and Allsop, 2016) and camper management of disabilities or illnesses (Hill et al., 2015; Woods et al., 2013). Indeed, prior research indicates medical specialty camps enhance *camper social and relationship skills* (Allsop et al., 2013), allow for *respite from feelings of isolation associated with their disability* (Bultas et al., 2015; Goodwin and Staples, 2005), and increase *confidence levels* (Woods et al., 2013). A distinguishing characteristic of most medical specialty camps, when compared with more "mainstream" camp models, is these camps primarily target children with chronic illness(es). Within this population, medical specialty camps focus on both the outcomes generally associated with mainstream camps (e.g., the development of autonomy, self-esteem, and peer relationships; Thurber et al., 2007) as well as the unique challenges facing the campers due in part to their illness or condition (e.g., resilience, disability management, communication skills; American Camp Association, 2012; Sendak et al., 2018). As nearly 15% of U.S. youth have special health care needs beyond the typical youth population, the potential of medical specialty camps to foster positive youth development (PYD) illustrates the importance of investigating the contextual- and resource-level factors that ensure the best possible outcomes for youth (Martiniuk et al., 2014). Opportunities to foster

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PYD generally occur when youth participate in activities that are enjoyable, well facilitated, and align with the youth's individual strengths (Seligman, 2002); however, many youth with disabilities tend to have fewer opportunities to participate in such activities, especially those with more complex health conditions (Law et al., 2006). Medical specialty camps, therefore, serve a key role in that they provide opportunities for PYD (i.e., competence, autonomy, self-esteem, sustained relationships with peers and adults, and skill-building) while youth are under the supervision of qualified medical personnel (Sendak et al., 2018).

As with the broader field of out-of-school-time (OST) programs, funding for camps is often sparse (Roth and Brooks-Gunn, 2016), with many medical specialty camps providing partial-to-full scholarships to enable camper attendance (Gillard and Allsop, 2016; Hill et al., 2015). With limited resources, those responsible for providing scholarships may have to make challenging decisions when faced with more campers than resources allow. Thus, there are emerging areas of research exploring the relationship between the limited resources necessary for youth to attend OST programs and which youth may be best served (Kirk and Day, 2011; Masten and Cicchetti, 2010), including the primary focus of this study, *the value of a camper attending a medical specialty camp for multiple years*. In the sections below, prior research investigating the relationships between medical specialty camp attendance and psychosocial outcomes is shared, the literature describing dosage (i.e., attendance) and outcome achievement is examined, and the results of the current study are presented and discussed.

1.1. Medical specialty camp and developmental outcomes

As with “mainstream” camps, medical specialty camps consist of multiple models including: *day camps* where campers are on-site during the day and return home overnight; *family camps*, where campers and their families are on-site together both in day and overnight versions; and *residential camps*, where campers stay on-site independent of their parent or guardian for multiple nights (Epstein et al., 2005). Medical specialty camps target a diverse array of outcomes. For some youth, these camps provide a context to escape (i.e., take a respite) from being the only youth with a particular disability or illness in their home life to being surrounded by peers with similar life experiences and challenges (Gillard and Watts, 2013; Wu et al., 2011). In a study exploring respite as an outcome of medical specialty camps, Bultas et al. (2015) shared that while “many of the children only saw each other once a year at the camp, they describe stronger relationships with those peers than peers they saw on a more frequent basis” (p. 545).

Beyond respite from a young person's typical day-to-day environment, there is also emerging support suggesting medical specialty camps can improve short- and long-term socioemotional functioning in campers. For instance, Kiernan et al. (2004) proposed medical specialty camp attendance was related to positive long-term changes in both a child's self-perception and self-esteem. Similarly, Woods et al. (2013) found campers attending a medical specialty camp became more goal-oriented and optimistic about their future. The research exploring medical specialty camps as a mechanism for development also suggests this setting may enhance camper social skills, intrinsic motivation, and confidence (i.e., behaviors reflecting self-determination). In a study of medical specialty camps serving children with cancer, Gillard and Watts (2013) noted the environment fostered at camp allowed children to develop meaningful and secure connections with peers and non-parental adults (*relatedness*), increased feelings of independence and control (*autonomy*) in children with limited control over their activity choices and time and enhanced intrinsic motivation to participate more fully in activities (*competence*).

In addition to fostering behavioral and socioemotional skills, medical specialty camps have been associated with the enhancement of skills directly related to the child's condition and corresponding self-care. For instance, many medical specialty camps promote the development of skills for campers to directly manage their health condition such as blood glucose monitoring (Hill et al., 2015), coping strategies (McAuliffe-Fogarty, Ramsing and Hill, 2007), and management of illness-related anxiety (Kiernan et al., 2004). Medical specialty camps can also promote campers' internal motivation to manage their disability and develop associated adaptive behaviors (i.e., *autonomous regulation*), and correspondingly reduce the need for extrinsic pressure from medical caregivers and family members to properly manage their disability (i.e., *controlled regulation*) (Levesque et al., 2007; McAuliffe-Fogarty et al., 2007). Taken together, these studies illustrate support for medical specialty camps as settings in which children over time can develop self-esteem, autonomy, competence, and relatedness; reflecting many of the dimensions of basic psychological needs (i.e., Self-Determination Theory; SDT) put forth by Ryan and Deci (2000). The concepts of underpinning SDT (i.e., autonomy, relatedness, and competence) have been a guiding outcomes framework for studies of medical specialty camps (Hill et al., 2015; McAuliffe-Fogarty et al., 2007), as in the case of the current study.

While medical specialty camps take many forms and target various outcomes, these camps are almost universally oriented towards enhancing outcomes associated with positive youth development (Sendak et al., 2018), particularly those aligned with self-determination and self-esteem. With this in mind, it is important to consider other OST programs and the impact they have on youth functioning and well-being.

1.2. Out-of-school time program attendance and outcomes

Within camp and OST program research, conventional wisdom suggests that more camp is better for the achievement of intended developmental outcomes (Thurber et al., 2007). More simply, if a child attends more camp days or sessions in a single year (i.e., a few weeks versus a few days) or returns to camp for multiple years, they will report increasingly substantial growth in the desired outcomes of the program (Thurber et al., 2007). This perception is supported by research in the broader field of OST programs. For example, Simpkins et al. (2004) reviewed a variety of OST programs (e.g., sport programs, afterschool academic development, summer camps) and indicated that repeated OST program attendance was positively associated with increases in the achievement of developmental outcomes.

Conversely, a broader review of OST programs conducted by Roth et al. (2010), which included summer camps, illustrated no relationship between repeated program attendance and developmental outcomes. The lack of clarity regarding the relationship between attendance and outcomes is supported by limited research in the context of medical specialty camps (Bultas et al., 2015). For example, in an examination of the development of self-efficacy and resilience at a camp for children with Type 1 diabetes, Winsett, Stender, Gower, and Burgen (2010) found no relationship between years of camp attendance and developmental outcomes. Somewhat counter to the null findings of Winsett et al. (2010), Briery and Rabian (1999) found repeated camp attendance was negatively related to reductions in illness anxiety. In other words, in their study Briery and Rabian (1999) demonstrated that as children gained more years of camp experience, they tended to score significantly *lower* in their achievement of desired programmatic outcomes.

A potential confounding variable in establishing the link (or lack thereof) between outcomes and repeated camp attendance relates to the developmental phase of the child attending camp (e.g., grade in school, age in years). For instance, the review conducted by Roth et al. (2010) suggested participant age may moderate the relationship between OST program attendance and outcomes among elementary, but not middle school students, and these effects were only found in 20% of the reviewed studies. Specifically, Roth et al. suggested that, as youth age, they appear to benefit less from repeated OST program attendance, also

noting the appearance of degradation in benefit to older youth may be related to differences in developmental life stage. Similar descriptions of the child's phase of development as a confound to the relationship between repeated program attendance and outcomes have been raised in the context of youth sport camps (Jones et al., 2011) as well as broader OST program settings (Lerner et al., 2005). Both Jones et al. (2011) and Lerner et al. (2005) suggested this degradation could be partly explained by the orthogenetic principle (Werner, 1957). This principle suggests that as a child develops (i.e., ages) they interact with an increasingly sophisticated array of people, places, and systems; thus, an environment (i.e., summer camp) which could serve as a powerful developmental context for a younger child, may not have the same degree of influence on an older child (Werner, 1957). Respectively, this orthogenetic influence should manifest with younger children reporting higher levels of development than their older peers in OST programs (Gestsdóttir and Lerner, 2007). Put differently, as a child increases in age, the strength of relationship between repeated medical specialty camp attendance and desired program outcomes should decrease. This does not necessarily suggest camp programs do not matter for older children, rather the orthogenetic principle framework suggests for older children, their competing non-camp experiences render repeated camp attendance as a less valuable experience than for their less developmentally advanced younger camp peers.

2. Study purpose and contribution

OST programs, including medical specialty camps, face escalating pressures to make evidence-based decisions with often limited resources and funding. As such, an understanding of which campers gain the most from program attendance is of critical importance to OST program administrators and researchers. In this regard, support for the value of repeated camper participation (i.e., camp attendance) and the achievement of desired programmatic outcomes, is mixed at best. To bring clarity to this challenge, the current study was guided by two hypotheses. First, the aggregate of research on outcomes associated with OST programs suggests this study's first hypothesis: H_1, *repeated camper attendance will not have a statistically significant ($p \leq .05$) effect on outcomes associated with the camp experience*. Second, there is research suggesting younger campers may experience greater developmental growth than their older peers. As such, this study also examines the moderating influence of age on the relationship between camper attendance and outcomes: H_2, *camper age will moderate the relationship between medical specialty camp attendance and camp outcomes, where increases in camper age will decrease the strength of relationship between repeated attendance and camp outcomes.*

3. Method

3.1. Sample and procedures

The study took place in the summer of 2017 in partnership with a nonprofit camp organization located in the southwest United States, which operated eight one-week residential camp sessions for youth with various chronic health conditions. All campers received a scholarship covering the full cost of their camp attendance. Camp sessions were intentionally designed to promote personal and social development, confidence, and empathy through the provision of activities including boating, adaptive sports, and horseback riding. Of the eight one-week sessions provided, two specifically served youth who had Type 1 diabetes, the focus of the current study.

Prior to recruitment and data collection the study received ethical approval through Clemson University's institutional review board. Campers and their parents were notified of the study through the camp administration's pre-camp communication with parents, through which parents were informed of the study and their ability to opt out. Campers were provided an assent letter outlining the research purpose, benefits, risks, and informed their participation in the study was voluntary. Data were then collected from youth in the form of paper questionnaires by trained camp staff members administered the last day of both sessions. The questionnaires asked campers to provide demographic information, prior camp experience, and to self-report development in their basic psychological needs, self-esteem, autonomous regulation, and controlled regulation. Of 295 possible respondents, 217 opted to participate in the study, indicating a 73.55% response rate to the questionnaire. Respondents were primarily female (n = 144, 67.3%), an average of 12.86 years old (SD = 1.73 years, range 10–16), were primarily Caucasian (78.3%), and had attended camp for an average of 3.17 years (SD = 2.12 years, range 1–13 years).

3.2. Data screening and setup

Prior to data collection, power analyses to determine the minimum sample size for testing of the two study hypotheses indicated the study sample of 217 respondents would adequately detect significant between factor correlations ($r \geq 0.10$ to -0.10, $p \leq .05$, $\lambda = 204.00$, 10-factor model) and linear relationships ($R^2 \geq 0.10$, $p \leq .05$, $\lambda = 23.33$, three predictor variables) (Cohen et al., 2003). The data were screened for outliers in SPSS 24 through an examination of the Chi-square distribution function and Mahalanobis distance. This screening process indicated 13 respondents were significantly ($p \leq .001$) contributing to non-normality within the data set, which were removed from further analyses.

The data were then examined for potential systematic causes of missing data [i.e., missing not at random (MNAR), missing completely at random (MCAR)] utilizing Little (1988) test of MCAR. The significant results of this test suggested potentially nonrandom, systematic causes for missingness in the data set [$\chi^2(2006) = 2572.606$, $p \leq .001$]. As such, further analyses of the data set were conducted to elucidate potential causes of systematic missingness. These analyses indicated no question (i.e., item) had greater than 5% of missing values (range = 0–2.5%), the ratio of complete to incomplete "cells" within the data set was less than 1% (of 11,832 data cells, 0.769% were missing), and t-tests between missing and non-missing respondents provided no statistically meaningful demographic difference relating to missing responses (Hair et al., 2010). Thus, given the relatively low levels of missing data (i.e., < 0.769% missing cells), an expectation maximization (EM) approach was utilized to generate missing values within the data set for testing of the hypotheses and measurement model (Enders, 2010).

3.3. Measurement

The questionnaire utilized within the current study consisted of multiple previously validated measures including basic psychological need satisfaction and frustration, autonomous regulation, controlled regulation, positive global self-esteem, and negative global self-esteem. These measures were selected for two reasons: first, these concepts were consistent with the camp's targeted program goals and second, the constructs have been used to understand change associated with medical specialty camp attendance (e.g., Hill et al., 2015). In addition to the aforementioned measures, "attendance" was operationalized as participation in a one-week camp session, while "repeated attendance" was operationalized as number of years of annual participation in a one-week camp session.

Basic Psychological Need Satisfaction and Frustration (BPNSFS). The six factors comprising the 24-item BPNSFS scale were developed based upon the work of Chen et al. (2015), who conducted a cross-cultural analysis of the factors comprising the measures. Need satisfaction is represented by "well-being" in three dimensions: autonomy satisfaction (e.g., *I feel a sense of choice and freedom in the things I undertake*; $\lambda = 0.64$ to 0.76, $\alpha = 0.81$), relatedness satisfaction (e.g., *I feel that the people I care about also care about me*; $\lambda = 0.66$ to 0.72),

competence satisfaction (e.g., *I feel confident I can do things well*; λ = 0.74 to 0.80, α = 0.88). Conversely, need frustration is represented by "ill-being" in three dimensions: autonomy frustration (e.g., *Most of the things I do feel like I have to*; λ = 0.61 to 0.69, α = 0.71), relatedness frustration (e.g., *I feel excluded from the group I want to belong to*; λ = 0.64 to 0.69, α = 0.81), and competence frustration (e.g., *I have serious doubts about whether I can do things well*; λ = 0.64 to 0.74, α = 0.86). All items were originally rated on 5-point Likert scale, from 1 (Completely untrue) to 5 (Completely true). In the current study, the Likert scale was increased to a 1 (Completely untrue) to 7 (Completely true) to encourage additional variation in response choice.

Autonomous and Controlled Regulation. Both autonomous and controlled regulation were measured based upon the diabetes self-management scale of Williams et al. (2004). In their study, Williams et al. (2004) measured treatment self-regulation as consisting of two components, autonomous and controlled motivation in the Treatment Self-Regulation Questionnaire (TSRQ). Respondents to the TSRQ are first asked to rate their agreement on a 7-point Likert scale ranging from 1 (strong disagree) to 7 (strongly agree) to items preceded by the prompt "the reason I follow my diet and exercise is that …" Respondents were also asked to rate their agreement with statements preceded by the prompt "the reason I take my medications as prescribed and check my glucose regularly is that …" Both the autonomous motivation (e.g., *I find it a personal challenge to do so*; α = 0.88, α = 0.86) and controlled motivation (e.g., *Other people would be upset with me if I didn't*; α = 0.67, α = 0.70) subscales exhibited acceptable reliability in past studies of diabetes management.

Self-Esteem. The 10-item Rosenberg Self-Esteem Scale (RSES) utilized in the current study measures positive and negative valuations of self, rated on a 4-point Likert scale, from 1 (strongly disagree) to 4 (strongly agree), where the ten item responses are totaled resulting in an overall self-esteem score (Supple et al., 2013). However, the RSES has been found to be prone to poor variation effects in some youth groups due to the narrowness of the one-to four-point Likert Scale (Gray-Little et al., 1997). As such, in the current study the scale was increased to seven points to mitigate this challenge and to reflect the formatting similarities in the other measures in this study. Additionally, in the current study, a two-factor model approach was selected reflecting the negative (e.g., *I certainly feel useless at times*) and positive (e.g., *I feel that I have a number of good qualities*) dimensions of global self-esteem, which has indicated acceptable levels of internal consistency in past studies (α = 0.83 to.86; Supple et al., 2013).

3.4. Analyses

To test the hypotheses guiding the current study, the analysis consisted of two stages. First, the measurement properties of the 52-item 10-factor scale were examined through a multiphase confirmatory factor analysis (CFA), where the model fit, convergent, and discriminant validity were examined over multiple iterations, where parameters and items (i.e., questions) fit within the model were examined, and items and parameters harming model fit were examined and respecified. Specifically, the Non-Normed Fit Indices (N−NFI), Comparative Fit-Indices (CFI), RMSEA (Root Mean Squared Error of Approximation), and the Satora-Bentler Chi-Square ($S/B\chi^2$) in combination with the LaGrange Multiplier (LM) model improvement test, were examined to understand the measurement model fit (Byrne, 2006; Kline, 2016). The convergent validity of the proposed 52-item scale was determined through examination of the Average Variance Extracted (AVE) levels and composite reliability scores (σ) (Bandalos, 2018; Byrne, 2006). Additionally, the discriminant validity of the proposed 10-factor measure was determined through examination of between-factor correlations (*r*) and √AVE levels (Bandalos, 2018). After the final measurement model was indicated, direct effects proposed in H_1 were tested utilizing structural equation modelling (SEM); and, moderational analyses proposed in H_2 were tested utilizing latent simple slopes analyses (e.g., +1 *SD* and −1 *SD*; Preacher et al., 2006).

4. Results

The initial CFA indicated two additional cases were contributing to multivariate non-normality in the model, which were removed from further analysis. Inspection of factor loadings and the CFA covariance matrix suggested three items from the autonomous regulation factor and one item from the controlled regulation factor had poor factor loadings (λ = 0.101 to 0.414). Additional inspection of the LaGrange multiplier model improvement test did not suggest respecification of the items would meaningfully advance model fit [$S/B\chi^2(1229) = 1770.605$, $p \leq .001$, N−NFI = 0.887, CFI = 0.895, RMSEA = 0.047 (90%, CI 0.042 to 0.051)] or factor loadings; as such, these items were removed from the model. After removal of these poor performing items, the final CFA model indicated acceptable levels of fit: [$S/B\chi^2(1035) = 1408.937$, $p \leq .001$, N−NFI = 0.916, CFI = 0.923, RMSEA = 0.042 (90%, CI 0.037 to 0.048)].

Upon evidence of acceptable model fit, the convergent validity of the 48-item 10-factor scale was examined utilizing Average Variance Extracted (AVE) scores, factor loadings (λ), and composite reliability scores (σ) provided in Table 1. In seven of 10 factors, AVE scores were above 0.5, suggesting these factors accounted for more construct (i.e., factor) variance than error. In the controlled regulation (AVE = 0.406), autonomous regulation (AVE = 0.444), and autonomy satisfaction (AVE = 0.490) factors, AVE scores failed to meet the 0.5 threshold. However, examination of the items comprising these factors indicated acceptable levels of composite reliability (σ = 0.756 to 0.871), and factor loadings (λ = 0.528 to 0.933) across these and the other factors comprising the measure, suggested emerging support for the convergent validity of the measurement model (Bandalos, 2018).

Support for the discriminant validity of the 10-factor measure is illustrated in Table 2, where nearly all √AVE values were at or above between-factor correlation levels. Notwithstanding this evidence, the items comprising the six factors of basic psychological need satisfaction and frustration (BPNSFS) had correlation levels at or above 0.900, suggesting potentially problematic shared variance levels across the satisfaction (*r* = 0.852 to 0.929) and frustration (*r* = 0.858 to 0.949) factors. However, given the past theoretical and observed interdependence (i.e., anticipated multicollinearity) of these factors, the 10-factor structure was retained (Deci and Ryan, 1985; Chen et al., 2015; Ryan and Deci, 2000). Finally, the criterion validity of the 10-factor model was established through examination of correlations between negative (i.e., frustration, negative self-esteem) and positive (satisfaction, positive self-esteem). As illustrated in Table 2, the satisfaction and frustration factors comprising the BPNSFS were negatively correlated at statistically meaningful levels ($p \leq .05$, $r = -0.327$ to -0.469), as were the positive and negative self-esteem factors ($r = -0.372$). In aggregate, the evidence of convergent, discriminant, and criterion validity provide emerging support for the construct validity of the 10 factors comprising the scale and appropriateness of hypothesis testing through SEM (Kline, 2016).

Given the acceptable measurement model fit and validity, the two study hypotheses were tested utilizing SEM with the between-factor correlation parameters removed (see also Fig. 1). The initial SEM indicated poor global fit: [$S/B\chi^2(1194) = 2723.598$, $p \leq .001$, N−NFI = 0.675, CFI = 0.696, RMSEA = 0.080 (90%, CI 0.076 to 0.084)]. Corresponding inspection of the LaGrange multiplier test suggested the removal of between factor correlation parameters from the measurement model (i.e., CFA) was the primary cause of this reduction in the quality of model fit from the measurement model. As such the model was respecified with factors indicating high observed correlations (e.g., factors comprising the basic psychological need satisfaction and frustration scales) covaried in the SEM. This modification led to meaningful improvement in model fit [$S/B\chi^2(1178) = 1720.102$, $p \leq .001$, N−NFI = 0.883, CFI = 0.892, RMSEA = 0.048 (90%, CI

Table 1
Final confirmatory factor analysis results.

Factor/*Item*	*M** (*SD*)*	λ	σ	AVE
Controlled Regulation			.871	.406
Other people would be mad at me if I didn't	3.552 (2.062)	.538		
I would feel guilty if I didn't do what my doctor said	4.379 (1.925)	.636		
I want my doctor to think I'm a good patient	4.978 (1.773)	.559		
I would feel bad about myself if I didn't	4.671 (1.906)	.732		
I don't want other people to be disappointed in me	4.767 (1.901)	.652		
Other people would be upset with me if I didn't	3.021 (1.795)	.559		
I would be ashamed of myself if I didn't	4.405 (1.872)	.675		
It is easier to do what I'm told than to think about it	4.076 (1.812)	.528		
I want others to see that I can follow my diet and stay fit	4.948 (1.699)	.722		
I'd feel guilty if I didn't watch my diet and exercise	4.179 (1.914)	.727		
Autonomous Regulation			.756	.444
It's exciting to try to keep my glucose in a healthy range	4.932 (1.759)	.543		
I personally believe that these are important in remaining healthy	6.127 (1.079)	.545		
I've carefully thought about my diet and exercising and believe it's the right thing to do	5.361 (1.461)	.800		
Exercising regularly and following my diet are choices I really want to make	5.604 (1.465)	.739		
Autonomy Satisfaction			.791	.490
I feel a sense of choice and freedom in the things I undertake	5.299 (1.382)	.551		
I feel that my decisions reflect what I really want	5.495 (1.336)	.685		
I feel I have been doing what really interests me	5.808 (1.275)	.768		
I feel my choices express who I really am	5.875 (1.221)	.773		
Relatedness Satisfaction			.881	.649
I feel that the people I care about also care about me	5.943 (1.255)	.819		
I feel connected with people who care for me, and for whom I care	5.980 (1.236)	.818		
I feel close and connected with other people who are important to me	6.112 (1.166)	.837		
I experience a warm feeling with the people I spend time with	5.809 (1.249)	.745		
Competence Satisfaction			.896	.684
I feel confident that I can do things well	5.995 (1.151)	.869		
I feel capable at what I do	5.943 (1.253)	.791		
I feel competent to achieve my goals	6.001 (1.178)	.828		
I feel I can successfully complete difficult tasks	5.841 (1.206)	.819		
Positive Global Self-Esteem			.926	.715
On the whole, I am satisfied with myself	5.812 (1.336)	.868		
I feel that I have a number of good qualities	5.835 (1.333)	.862		
I am able to do things as well as most other people	5.908 (1.206)	.797		
I feel that I'm a person of worth, at least on an equal plane with others	5.911 (1.264)	.874		
I take a positive attitude toward myself	5.907 (1.222)	.823		
Negative Global Self-Esteem			.916	.687
At times, I think I am no good at all	3.036 (2.027)	.828		
I feel I do not have much to be proud of	2.436 (1.827)	.808		
I certainly feel useless at times	2.570 (1.889)	.933		
I wish I could have more respect for myself	2.888 (2.003)	.758		
All in all, I am inclined to feel that I am a failure	2.002 (1.605)	.808		
Autonomy Frustration			.835	.565
Most of the things I do feel like "I have to"	3.062 (1.733)	.553		
I feel forced to do many things I wouldn't choose to do	2.252 (1.509)	.801		
I feel pressured to do too many things	2.042 (1.388)	.779		
My daily activities feel like a chain of obligations	2.035 (1.395)	.839		
Relatedness Frustration			.868	.624
I feel excluded from the group I want to belong to	2.282 (1.560)	.638		
I feel that people who are important to me are cold and distant towards me	1.875 (1.472)	.821		
I have the impression that people I spend time with dislike me	2.170 (1.517)	.826		
I feel the relationships I have are just superficial	2.009 (1.360)	.855		
Competence Frustration			.932	.775
I have serious doubts about whether I can do things well	2.164 (1.479)	.819		
I feel disappointed with many of my performances	2.085 (1.475)	.933		
I feel insecure about my abilities	2.108 (1.576)	.860		

(*continued on next page*)

Table 1 (*continued*)

Factor/*Item*	*M** (*SD*)*	λ	σ	AVE
I feel like a failure because of the mistakes I make	1.901 (1.421)	.904		

Note. *Means (***M***) and *Standard Deviations (***SD***) based upon Expectation Maximization (EM) Values.
λ: standardized coefficient (factor loading, lambda); **σ**: Joreskog's Rho (composite reliability); **AVE**: Average Variance Extracted.

0.043 to 0.053)]. Thus, this analysis confirmed H_1, as repeated camp attendance had no statistically significant ($p \leq .05$) direct effect on any of the 10 factors in the model. To test H_2, *camper age will moderate the relationship between camp attendance and camp outcomes, such that as campers increase in age the strength of relationship between attendance and camp outcomes will decrease*, the moderating effect of age on the relationship between attendance and outcomes was examined through a simple slopes analysis (Preacher et al., 2006). The results of this analysis (conducted in R version 3.0.2) indicated no significant ($p \leq .05$) moderational effects at high (+1 *SD above M*), mean (*M*), or low (−1 *SD below mean*) levels of the moderator (camper age) on the relationship between repeated camp attendance and the 10 camp outcome factors. More simply, H_2 was rejected in the current study.

5. Discussion

This study examined the relationship between camp attendance and programmatic outcomes to determine the value of repeated attendance in a medical specialty camp context. Given the study design and measures, we failed to detect a statistically significant ($p \leq .05$) association between camp attendance and our measured outcomes, suggesting campers who attend camp for multiple years demonstrated no statistical difference in their self-reported outcomes when compared with campers who attended camp for fewer years. On one hand, this non-significant finding is consistent with the literature associated with participation in OST programs. Specifically, the current study findings parallel the systematic review of Roth et al. (2010), which indicated across multiple OST contexts repeated attendance did not (generally) have a meaningful influence on program outcomes. Indeed, Roth et al. stressed, "we found little support for the benefits of greater amounts of participation" (p. 318). The lack of effect of repeated attendance on outcomes continues to challenge the prevailing conventional wisdom noted by Thurber et al. (2007) that "more camp" leads to escalating levels of positive developmental outcomes. Other studies have also disputed this assertion. For example, in examinations of the effect of participation on positive youth development (PYD), both Durlak et al. (2010) and Lerner et al. (2005) found no relationship between escalating levels of participation and the achievement of PYD outcomes.

On the other hand, this finding may reflect limitations associated with measuring the specific outcomes examined in this study. More precisely, the targeted study outcomes (e.g., growth in developmental areas associated with basic psychological needs), may reflect global constructs which are difficult to influence through a single-week camp experience. Such an interpretation is suggested by prior research which demonstrated no effect on similar outcomes following a similar one-week medical specialty camp experience (Woods et al., 2013); additional empirical evidence on how quickly program effects associated with medical specialty camps can degrade also suggests the short duration of a single experience (when not associated with more frequent, longer-term involvement) may not meaningfully influence all targeted outcomes (Dawson, 2017; Plante et al., 2001). Put differently, if program effects associated with camp participation tend to return to baseline levels following the camp experience, then such effects may not accumulate over time due to this regression. However, as this study examined years of attendance as a potential multiplier of outcome scores, some growth should have been evidenced if multiple years of attendance (and corresponding normative development) could influence the targeted outcomes.

Additionally, accurately measuring the relationship between attendance and outcomes could also be attributed to the inherent complexity of measuring "participation." For instance, Roth et al. (2010) noted participation in OST programs likely involves at least five aspects: "intensity (i.e., frequency of attendance during one program year), duration (i.e., years of attendance), total exposure (i.e., frequency of attendance over multiple years), breadth (i.e., involvement in different program activities), and engagement (i.e., effort and interest in program activities)" (p. 311). In the current study setting, two dimensions of participation (i.e., "intensity" and "total exposure") were generally unmalleable due to the fixed-time nature of most camp programs. Specifically, "intensity" as a measure of participation may not be as relevant within the context of summer camp research as campers are onsite and in attendance for generally the same amount of time. Similarly, "total exposure" may not transfer as a measure of summer camp attendance as it reflects a measure of attendance intensity (i.e., days, weeks) over multiple years (not to be confused with duration which refers to the *total* number of years of attendance). However, in future studies exploring the relationship between outcomes and participation in medical specialty contexts, breadth and engagement should be examined in addition to duration (Durlak et al., 2010; Tiffany et al., 2012). The addition of these variables may provide support for a combination of participation-related factors that influence program outcomes.

The rejection of H_2, *camper age will moderate the relationship between medical specialty camp attendance and camp outcomes, where increases in camper age will decrease the strength of relationship between repeated attendance and camp outcomes*, was potentially unsurprising given the lack

Table 2
Between-factor correlations.

Factor	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
F1. Controlled Regulation	**.637**									
F2. Autonomous Regulation	.510*	**.665**								
F3. Autonomy Satisfaction	.337*	.635*	**.700**							
F4. Relatedness Satisfaction	.214*	.474*	.874*	**.805**						
F5. Competence Satisfaction	.206*	.497*	.929*	.852*	**.827**					
F6. Positive Global Self-Esteem	.094	.450*	.775*	.744*	.800*	**.845**				
F7. Negative Global Self-Esteem	.151*	-.148	-.190*	-.162*	-.254*	-.372*	**.828**			
F8. Autonomy Frustration	.069	-.368*	-.458*	-.389*	-.469*	-.574*	.630*	**.751**		
F9. Relatedness Frustration	.048	-.127	-.432*	-.427*	-.464*	-.642*	.638*	.858*	**.789**	
F10. Competence Frustration	.078	-.227*	-.373*	-.327*	-.434*	-.617*	.673*	.882*	.949*	**.880**

Note. Correlations in **boldface** indicates √**AVE.** *$p \leq .05$.

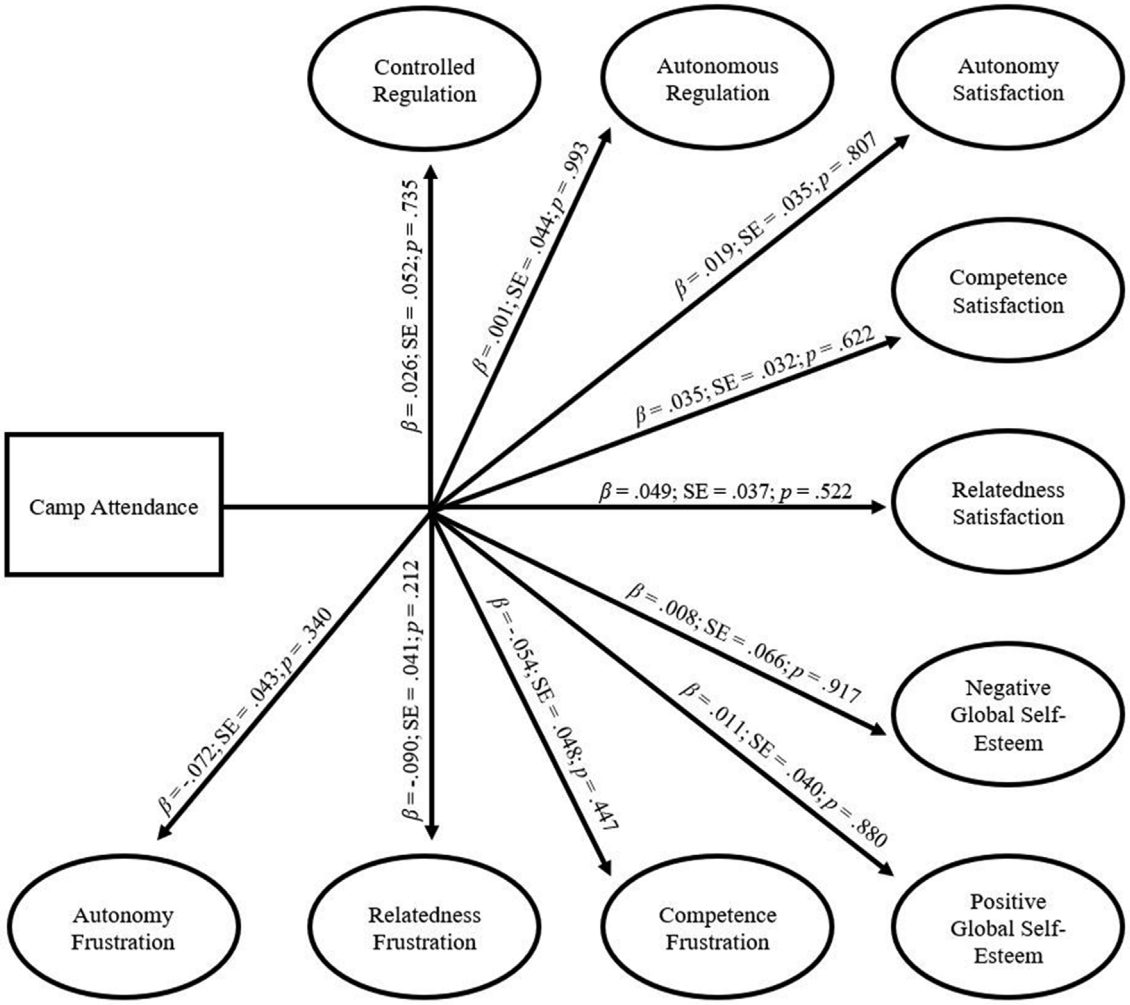

Fig. 1. Structural model of effect of attendance on outcomes. *Note covariances, error terms, and items excluded for parsimony of presentation.

of a statistically significant direct effect of attendance on the ten study outcomes. However, as moderational testing may detect an effect that is non-significant at one level of a moderator (e.g., mean level) and significant at another level (e.g., one *SD* above the mean) it was possible that an age-related (i.e., ontogenetical, maturation) effect could have been present in the current study despite the lack of direct effect of attendance on outcomes (Hayes, 2013). Prior studies conducted in camp settings (Thurber et al., 2007) and broader OST programs (Bowers et al., 2010) have suggested invariance across age groups as they relate to many of the outcomes associated with these programs. In future studies, the possible moderating effect of age on the relationship between program participation and outcomes [as suggested by Roth et al. (2010) for younger children] should be examined utilizing the more multidimensional measurement approaches suggested by Tiffany et al. (2012) and Roth et al. (2010) to determine if more nuanced relationships are present across differing ages of campers. Further, the addition of a "time since diagnosis" measurement (where applicable), may provide additional support for determining which medical specialty campers benefit most from repeated camp attendance.

While tertiary to the primary focus of the current study, the relatively convincing evidence for the measurement model (e.g., convergent, discriminant, and criterion validity) suggests that the combination of scales used in this study may provide additional tools to investigators interested in exploring the development of self-determination and self-esteem within the medical specialty camp environment. As Wu et al. (2011) noted, the reliability and validity of measures utilized within medical specialty camp remain underdeveloped when compared to "mainstream camp" and OST program research. Thus, the use of CFA and other supporting statistics in the current study provides strong and continuing support for the measures used in a medical specialty camp setting.

A key consideration when examining the effect of repeated camp attendance on outcomes is that while no meaningful differences in outcome achievement were found across the constructs of interest in the current study, it is possible additional unmeasured development occurred. However, camp directors and decision makers must balance this possibility against funders' desired outcomes to determine if congruence remains. While unintended benefits from OST programs may occur for youth, a key consideration remains: if a camp claims to achieve outcome Y, yet achieves outcome A instead, then this unintended benefit (i.e., outcome "A"), while potentially meaningful, suggests the need for organizational or programmatic realignment (e.g., shifting primary focus to outcome A) and/or retraining of staff responsible for achieving outcome Y. In the current study site, the development of self-determination and self-esteem were the key foci of the camp's programming and therefore potential unintended outcomes were not considered. This approach reflects the recommendations of Bialeschki et al. (2007) and Garst and Gagnon (2016), who suggested attention to intentionality and fidelity to targeted outcomes are crucial for the success of camp programming and mission achievement.

As with many investigations, future research is needed to inform the study findings. For example, unmeasured yet potentially influential

outcomes of medical specialty camp participation include cost-related impacts of medical treatment (e.g., number of doctor visits following camp experiences, number of medications prescribed) as suggested by Hill et al. (2015) discussion of improved maintenance of one's diabetes following camp. That is, medical specialty camp experiences may have therapeutic value such to the extent that families experience reductions in the number of health services they access following camp (for example, because of increases in a child's self-management of their illness as summarized by Plante et al., 2001). Thus, cost-related outcomes may be more proximal to a child's experience and less global in nature (when compared with socio-emotional outcomes such as those targeted in this study) and provide a compelling opportunity for future research.

Future studies could also examine the influence of attending medical specialty camps from the perspective of parent, sibling, or healthcare provider. Per the recommendation of Woods et al. (2013), collecting outcomes data from multiple sources could provide "a more comprehensive assessment of youth functioning" (p. 95) and highlight the additional impact (or lack thereof) medical specialty camps have on development. Parental perceptions of their child's medical specialty camp experience may be particularly valuable. For example, examining parental expectations (as suggested by Heiman, 2002), parental anxiety (as suggested by Simons et al., 2007), and parenting style (as suggested by Gagnon and Garst, 2018), may further advance the body of literature associated with medical specialty camps. Additional research into these areas may identify other outcomes of medical specialty camp attendance, as well as factors influencing outcomes, beyond those identified by youth.

5.1. Limitations

While some study limitations have been noted in the preceding discussion, a few more should be described in greater detail. First, the study utilized a cross-sectional design (i.e., the data were only collected at one-time point immediately following the camp experience). Cross-sectional designs may not fully capture the phenomena of interest or introduce selection bias into a sample (Shadish et al., 2002). However, in the current study the use of a repeated attendance variable (e.g., multiple years of attendance) may have partly mitigated these concerns. Future examinations of the changes in outcomes scores may benefit from the additional information obtained from longitudinal measurements of outcomes (e.g., moving from intercepts only models to slopes and intercepts models). Second, the study sample was relatively homogenous (i.e., 78.3% Caucasian), and while this reflects prior studies of medical specialty camps serving children with Type 1 diabetes (e.g., Hill et al., 2015), a more heterogenous sample may demonstrate differential relationships between attendance and outcomes. Further, it is possible that similar studies conducted within the context of camps serving children with other medical needs or disabilities (e.g., cancer, Down syndrome, cerebral palsy) may reach different conclusions regarding the relationship between attendance and outcomes than the current study. In future research, between-group comparisons may illustrate which groups benefit the most from repeated camp exposure. Third, the high correlations within the basic psychological needs satisfaction factors (i.e., autonomy, relatedness, and competence satisfaction) and the basic psychological needs frustration factors (i.e., autonomy, relatedness, and competence frustration) suggests the need to investigate a possible second-order factor structure (e.g., common cause) of these factors in future research if similarly high correlations are evidenced (Brown, 2015; Byrne, 2006). This could lead to more parsimonious models in future investigations.

6. Conclusions

The study findings, which failed to provide evidence that attending camp for multiple years provides greater outcomes than attending camp for only one year, presents an interesting conundrum for stakeholders (i.e., program providers, funders) seeking to engage youth and families in medical specialty camps. If the positive outcomes associated with participation in medical specialty camps are weighted towards growth in the first year when compared to growth over multiple years, how should program providers engage youth and families for ongoing recruitment? Further, how should limited scholarship funds be allocated across first-year and returning campers? What messages should be communicated to parents who want their child to have ongoing involvement in camp across their middle and high school years? In some cases, allocating more resources for first-year campers (in addition to allocating fewer resources toward the recruitment of returning campers) may provide a reasonable solution. Yet the answers to these questions also have implications for how programs are designed and implemented. Paying attention to best practices in program development such as progression of skills towards mastery as well as program fidelity (i.e., implementing programs as designed) may become critical for ensuring ongoing positive outcomes for youth who return to camp for multiple years. Furthermore, Dawson (2017) call for new camp program models "to capture the therapeutic potential that is currently untapped in one-week residential experiences" (p. 11) might make program impacts over time more likely, including program components such as booster interventions and social media contacts that may influence and sustain youth outcomes as a result of camp during the many weeks when camp is not in session.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2018.12.014.

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