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Exploring the Intersection of Beliefs toward Outdoor Play and Cold Weather among Northeast Minnesota's Formal Education and Non-formal EE Communities

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ABSTRACT

In a notoriously cold-seasoned region, this paper explored how our formal education and non-formal environmental education (EE) gatekeepers of Northeastern Minnesota regard the importance of outdoor play and cold weather for young students. This research study explored the relationship between participant gatekeepers' beliefs of the benefits outdoor play and beliefs toward cold weather. Using online survey research, this descriptive study found both formal and non-formal EE educational communities to have overall, positive beliefs toward the benefits of outdoor play, however, significant differences between formal education gatekeepers and non-formal EE gatekeepers' beliefs toward cold weather emerged. Results from this study point toward differences between the institutional influence of formal and non-formal EE, and invite discussion for possible implications on early childhood students' opportunities for outdoor play in cold weather. Strategies for educational gatekeepers were also presented to support early childhood opportunities for outdoor play in cold weather, fostering year-round well-being and resilience of young students.

Keywords: outdoor play, winter, cold weather, early childhood, formal education, non-formal environmental education, gatekeepers

When children are asked about their favorite subject in school, their answers are most often "recess." Though quite possibly an act of academic defiance, studies suggest that outdoor play such as recess actually produces equally important cognitive, socio-emotional, and physical benefits as classroom schooling and academics (Murray & Ramstetter, 2013). As proven complementary to children's whole development, play provides a "vehicle for children to both develop, and demonstrate knowledge, skills, concepts, and dispositions" (Little & Wyver, 2008, p. 33). Across literature, it is agreed that play is a scaffold of development for children (Brown & Vaughan, 2009; Brockman, Fox, & Jago, 2011; Copeland, Sherman, Khoury, Foster, Saelens, & Kalkwarf, 2011; Little & Wyver, 2008; Vetich, Bagley, Ball, & Salmon 2006).

Parents, educators, and educational administrators alike, who are outdoor play gatekeepers by providing and administering outdoor opportunities for young children, all respond positively to the numerous benefits to children's outdoor play (Copeland, Kendeigh, Saelens, Kalkwarf, & Sherman, 2012a; Ginsburg, 2006; Rothe, Holt, Kuhn, McAteer, Askari, O'Meara, & Dexter 2009). Whether obesity prevention, gross motor skill development, increased self-efficacy, stress relief, decreased sedentary activities and social conflict, and improved mood and attention, there

is a consensus from these adult gatekeepers who positively acknowledge the benefits that outdoor play provides. This consensus, however, is called into question based on current and ongoing research that suggests that children's outdoor play gatekeepers are not providing adequate outdoor play opportunities for young children.

Despite the broad developmental and health benefits, children's opportunities for outdoor play are declining, and children are spending less time playing outdoors than previous generations (Tandon, Zhou, & Christakis, 2012). Whether increased built environments that limit green space to play in, decreased sense of community in neighborhoods, heightened concerns of safety, or intensified academic pressures, children are confine to play in smaller spaces and in more controlled activities (Brockman et al., 2011; Little & Wyver, 2008; Slater, Nicholson, Chriqui, Turner, & Chaloupka, 2012). For many young children, childcare or school recess are the only time children are given to engage in outdoor play (Copeland et al., 2011; Tandon et al., 2012).

Implications of seasonal climate and weather conditions on children's outdoor play

Throughout this decline of adequate outdoor play opportunities for young children, a significant and consistent barrier looms overhead among outdoor play gatekeepers—adverse weather (Bélanger, Gray-Donald, O'Loughlin, Paradis, & Hanley, 2009; Chan, Ryan, and Tudor-Locke 2009; Humpel, Owen, Iverson, Leslie, & Bauman, 2004; Kos & Jerman, 2013; Mitra & Faulkner, 2012; Stanley, Boshoff, & Dollman, 2012). Whether extreme heat, extreme cold, or wet conditions, children's opportunities for outdoor play are reduced in these perceived unfavorable conditions (Mitra & Faulkner, 2012). Seasonal climate and adverse weather conditions, such as cold weather, seem to receive less attention in literature because it is unalterable and comes with varying human perceptions (Mitra & Faulkner, 2012).

Despite the consensus that many gatekeepers feel that outdoor play is important, outdoor play in winter "paradoxically decreases" (Rothe et al., 2009, p. 735). Kos and Jerman (2013) studied the frequency and duration of time spent outdoors in Norwegian and Slovene preschools. For both countries, teachers allotted significantly more outdoor time in warm months than cold months.

For many regions with distinct seasonal variation in climate, it is not clear as to how young children's opportunities for outdoor play are affected by weather condition within extreme seasons like cold weather (Mitra & Faulkner, 2012). The term "cold" as defined by Merriam-Webster, is defined dually as an environmental weather condition of "relatively low temperature," as well as a human perception of "temperature that is uncomfortable" ("Cold," 2014). For the purpose of this study, these dual definitions are important to consider, as human perceptions of cold differ based on many factors.

Though children's opportunities for outdoor play are commonly determined by environmental opportunities, it is of interest to explore how gatekeepers' seasonally-specific norms of climate and weather conditions may affect children's opportunities for outdoor play. Copeland et al. (2011) suggested further research is needed to understand how gatekeepers' beliefs about cold weather intersect with "decisions about outdoor play" (p. 440).

The intersection of gatekeeper belief and outdoor play opportunity

As young children's outdoor play experiences provide a "developmental perspective," it is of particular interest for this study to research outdoor play in cold weather as a catalyst for young students' "year-round well-being" (Ergler, Kearns, & Witten, 2013, p.183). The growing seasonality of outdoor play may more strongly and predictably limit children's opportunities for physical, cognitive, and socioemotional development (Ergler et al., 2013; Copeland et al., 2012a). Because it is unclear how children's opportunities for outdoor play are influenced by children's adult gatekeepers, Copeland et al. (2011) proposed more research is needed to understand how gatekeepers' beliefs about weather have the potential to influence decisions about outdoor play opportunities for young children.

Beliefs toward cold weather. According to Österholm (2010), a "belief can be seen as a type of knowledge that is subjective, experienced-based, and often implicit" (p. 157). Beliefs are a "personal judgement formulated by

experiences" under a cultural dimension (Österholm, 2010, p. 157). In this study, the construct "beliefs toward cold weather" are compartmentalized into four sub-constructs: cognitive, affective, self-efficacy, and normative beliefs.

Cognitive beliefs toward cold weather. Cognitive beliefs toward cold weather are those beliefs that comprise an individual's worldview and determines how one "abstracts, filters, and structures information received from the world" ("Cognitive belief system," 2017). Cognitive beliefs, then, are the structural framing of how outdoor play gatekeepers interpret and act cold weather.

Affective beliefs toward cold weather. Affective beliefs toward cold weather are those beliefs that comprise of an individual's experience of feeling or emotion. Affective beliefs, then, are the emotional states of how gatekeepers feel about cold weather, such as like and dislike.

Self-efficacy beliefs toward cold weather. Self-efficacy beliefs toward cold weather are an individual's capability to produce effects in cold weather. That is, self-efficacy beliefs determine how gatekeepers may think, motivate themselves, and behave during cold weather (Bandura, 1994).

Normative beliefs toward cold weather. Normative beliefs toward cold weather are an individual's beliefs about how other people, who are important to them, think they should or should not perform a particular behavior (Flay, 2014). Especially in the research of educational communities, whose structure and framework have heavy social ties, normative beliefs are a significant sub-construct to include.

Personal and gatekeeper beliefs*.* The scope of this study also included formal educational and non-formal EE communities' personal and professional beliefs toward cold weather. This dual inquiry explored the difference between and individual gatekeeper's beliefs toward cold weather from a personal lens as well as a gatekeeper lens of personal beliefs and gatekeeper beliefs. "Personal beliefs toward cold weather" refer to participants' beliefs that are developed and nurtured in participants' non-professional lives. "Gatekeeper beliefs" refer to those beliefs that incorporate participants' professional, supervisory role among their students, as well as fellow staff and administration.

This complex belief construct was chosen to thoroughly explore the potential belief intersections, where cold weather beliefs have the potential to compromise young students' outdoor play opportunities. Since weather continues to be a leading barrier of outdoor play among gatekeepers, it is the intention of this study to explore how a gatekeeper's individual viewpoint may have the possibility to subjectively limit young students' outdoor play opportunities in cold weather, which in Northeast Minnesota is a significant portion of the academic year.

The parallels between formal education and non-formal Environmental Education

Institutionally, it was of interest to include outdoor play gatekeepers from two educational institutions, formal education and non-formal environmental education (EE). Formal education, as defined by Ellinger (1997), is "institutionally sponsored, highly structured, and classroom-based" (p.38). Learning objectives of formal educators are controlled by the institution, and require specified, hierarchical levels of training, licensure, certification, and degree for teachers and administrators alike. Such formal programs often reflect what the institution views as appropriate structure (Heimlich, 1993). It is important to note that formal education is an extensive experience, as students matriculate from childhood into adulthood.

Non-formal EE, on the other hand, refers to "settings and methods that are considered non-traditional" (Taylor & Caldarelli, 2004, p. 452). Within this institution, the outdoors is a primary setting for student learning, and play is a vehicle for learning. Non-formal educators use natural areas as a classroom and emphasize a learner-centered, present-time focused, less structured, and typically non-hierarchical environment (Taylor and Caldarelli, 2004, p. 452). Since audience, environment, time, and expectations are dynamic to every class, non-formal educators are encouraged to develop awareness to respond more readily to the needs of the audience as well as the environmental conditions. Such dynamic environmental challenges also contain elements of inherent risk (Taylor & Caldarelli, 2004,

p. 465). As a value of non-formal environmental education, risk-taking, whether controlled or inherent allows students to expand their worldview and develop self-efficacy (Little & Wyver, 2008).

Within the area of focus for this study, formal education and non-formal EE are intermingled across the region and exhibit complementary, yet contrasting educational settings for children. Both educational institutions are deeply connected to early childhood development, and both are experiencing the effects of shrinking outdoor play opportunities. For the scope of this study, including both formal education and non-formal EE was significant to investigate the recognized benefits to outdoor play and beliefs toward cold weather between educational settings, but also highlight the continuing need to bridge institutional practices to enhance and expand early childhood outdoor play opportunities, especially in cold weather.

Area of focus: Northeast Minnesota

For the state of Minnesota, its natural and cultural histories are rooted in the changing seasons, and known for its below-freezing, long winters. With such distinct seasonal differences, there is much to be explored when it comes to the "complexities of play across both seasonality and locality and its consideration of implications for children's well-being" (Ergler et al., 2013, p. 183). As Minnesota has approximately five months of winter (November through March), educational gatekeepers may have more potential of influencing students' opportunities for outdoor play during cold weather months.

Demographic Considerations

In terms of demographics, ethnicity and income are primary predictors when it comes to participation in outdoor activities (Brewer & Kimbro, 2014; Kukaswadia, Pickett, & Janssen, 2014). Income and ethnicity disparities to outdoor play are attributed to weather conditions, climate of origin, access to quality facilities and necessary equipment, perceived safety in neighborhood, resource constraints, and health concerns (Brewer & Kimbro, 2014; Copeland et al., 2011; Rothe, et al., 2009). For the purpose of this research, disparities of ethnicity and income are acknowledged when it comes to gatekeepers' decisions on children's outdoor play and how gatekeeper attitudes may affect how weather-related decisions are approached for diverse student bodies, however ethnic and income demographics were not directly researched in this study.

PURPOSE

The purpose of this research was to describe the beliefs regarding the benefits of young children's outdoor play, as well as the beliefs toward cold weather among Northeast Minnesota's formal education and non-formal EE communities with early childhood grades (K-3). This research also explored the degree to which the importance of children's outdoor play and gatekeeper beliefs toward cold weather were related within formal education and non-formal EE gatekeepers.

Rationale

With the growing literature and community support regarding outdoor play's contribution toward early childhood students' academic success, cognitive development, physical development, socio-emotional development, overall health and wellness, and development of appreciation for the environment, it is significant to be cognizant of early childhood educational gatekeepers' influence on young students' opportunities to outdoor play, especially if outdoor play opportunities are becoming more exclusive to a student's formal school day. With the declining opportunities to play outdoors, there is a need to revisit young children's educational gatekeepers, whose beliefs regarding the benefits of outdoor play and beliefs toward cold weather may reflect how individual gatekeepers and educational institutions might conditionally influence opportunities for outdoor play.

Minimal research of this nature has been conducted from the field of Environmental Education (EE), as well as Early Childhood. This research is significant for several reasons. First, this research supports EE's mission of addressing children's nature deficit disorder, and advocating for young children to experience the outdoors and cultivate

integrated physical, cognitive, and socio-emotional development in all seasons. Second, as heightened concerns of safety and liability infiltrate our society, particularly in unmodifiable terms of adverse weather, it is of significance to research how gatekeepers of different educational setting personally and professionally, as a gatekeeper, perceive cold weather, and consider how they may influence young children's outdoor play opportunities. Similarly, with the formal school community being a major audience and customer of non-formal EE programs, this research intends to offer insight on the beliefs of these two complementing, yet contrasting educational settings in order to begin a dialogue to support young students' cold weather, outdoor play opportunities.

Ultimately, this research described a region's educational communities' beliefs toward the importance of early childhood students' outdoor play and cold weather, in hopes to continue the conversation of supporting their year-round well-being and resilience between formal education and non-formal EE communities. Due to lack of empirical research, this research study also aimed to lay groundwork of strategies and present avenues for future research on children's cold weather and outdoor play opportunities (Copeland et al., 2011).

Research Questions

The primary research questions were threefold:

(1) What are the beliefs regarding the benefits of students' outdoor play among Northeast Minnesota's formal education community and non-formal EE community?

(2) What is the difference of beliefs toward cold weather between Northeast Minnesota's formal education community and non-formal EE community from a personal and gatekeeper perspectives?

(3) How are formal education community gatekeeper beliefs related to beliefs regarding benefits of outdoor play? How are non-formal EE community gatekeeper beliefs related to beliefs regarding benefits of outdoor play?

RESEARCH METHODS AND DESIGN

Using quantitative methods, this research used an online survey design, as it aimed to "generalize from a sample to a population so that inferences can be made" (Creswell, 2014, p. 157). This design was chosen for its advantages to both the researcher and population of interest including electronic accessibility, confidentiality, inexpensive distribution, and timely survey duration. Stratified sampling was used to reach each participant group at the discretion of educators' respective administrators through online survey research. Online survey research intended to not only capture a large sample size, but also produce descriptive assertions about the population of interest (Babbie, 2011). Self-administered online questionnaires were issued using CampusLabs™, an online survey tool.

Participants

The population of interest for this study was educators and administrators of formal and non-formal EE institutions, who pose a gatekeeping role in outdoor play for Kindergarten (K) through third grade (3) students (typically age five through eight). The accessible population was formal and non-formal educators and administrators from Northeast Minnesota, whose respective institutions and employment positions included early childhood grades K-3.

Formal Education and Non-formal EE Participants. For this research, formal education and non-formal EE communities, including administrators and educators, were significant to survey, as they bring similar and contrasting teaching styles, settings, beliefs, and outcomes for students (Taylor & Caldarelli, 2004). Among the formal education participants are formal education administrators and K-3 teachers. Among the non-formal EE participants are EE administrators and EE educators

***Formal education administrators*.** Within formal education communities in Northeast Minnesota, formal administrators were individuals at the administrative professional level, who take part in decision-making and policies regarding outdoor play at public and charter schools. Formal education administrators included public school

principals, charter school directors, and district superintendents. Forty-seven formal education administrators from twenty school districts in Northeast Minnesota were initially contacted via email and phone to participate in the online survey in April 2015. At the completion of the first solicitation in June 2015, a total of 23 of the 47 (48.9%) formal education administrators from 18 of the 20 school districts in Northeast Minnesota completed the online survey.

***Formal K-3 teachers*.** Within formal education communities in Northeast Minnesota, formal K-3 teachers were individuals who directly teach grades Kindergarten through third grade students in public or charter schools. It was estimated that there were 240 K-3 teachers within public or charter schools in Northeast Minnesota. This population was reached through stratified sampling through formal education administrators who responded and consented to the research of their K-3 teachers. Approximately 240 K-3 teachers made up the accessible K-3 teacher population in Northeast Minnesota, whose formal education administrator had consented to the research of their respective teachers.

At the completion of the first solicitation in June 2015, a total of 23 of 240 (9.5%) K-3 teachers had completed the online survey. With the significantly lower response rate, a second solicitation of the online survey was sent again in September 2015. Approximately 240 K-3 teachers were directly invited to participate in the online survey. At the closing of the second solicitation in October 2015, an additional 36 K-3 teachers responded, totaling to 59 K-3 teachers (24.6%).

***Non-formal EE administrators*.** Within non-formal EE communities, EE administrators were individuals at the administrative, professional level of EE organizations, who take part in decision-making and policies regarding outdoor play. EE administrators included educational program directors and executive directors, who oversee educators, programming, and policy at Residential Environmental Learning Centers (RELCs), nature centers, and adventure education centers. Six non-formal EE administrators of three RELCs, one nature center, and one adventure education center Northeast Minnesota were invited to participate in this study. At the completion of the first solicitation in June 2015, five of the six EE administrators from three of the five EE organizations completed the online survey.

***Non-formal EE educators*.** Within non-formal EE communities, EE educators were individuals who directly teach environmental education to students in an outdoor setting at an EE organization. EE educators included full-time and part-time, permanent and seasonal programming staff at EE organizations in Northeast Minnesota. This population was reached through stratified sampling through EE administrators who responded and consented to the research of their EE educators. Forty-one EE educators made up the accessible EE educator population in Northeast Minnesota, whose EE administrator had consented to the research of their respective educators. At the completion of the first solicitation in June 2015, a total of 16 of 41 (39.0%) EE educators had completed the online survey.

Participant Demographics. At the completion of the second solicitation in October of 2015, a total of 92 participants completed the online survey of the estimated 333 possible sample (27.6% response rate). Of the educational communities, 73 formal education participants responded (22 out of 47 formal administrators and 51 of 240 K-3 teachers), and 19 non-formal EE participants responded (four out of six EE administrators and 15 out of 41 EE educators). Eleven surveys were removed from the data set due to survey abandonment or incomplete responses, (e.g.: identified teaching students outside of early childhood ages), resulting in the total number of participants' analyzed to be n=92 (formal education administrators, n=22; K-3 teachers, n= 51; EE administrators, n=4; EE educators, n=15).

Of the formal educational community, eighteen of the twenty public school districts of Northeast Minnesota were represented in this sample. Of the non-formal EE community, three of three EE organizations of Northeastern Minnesota with early childhood grade configurations (K-3) were represented in this sample.

In contrast to the formal setting, it is important to note that each of these non-formal EE organizations has staffing configurations that vary seasonally. Similarly, environmental education programming is typically designed to be

adaptably delivered to students of various ages, grade levels, and abilities. Organization 1 is K-12, and serves 501 to 1,000 students in one academic year; organization 2 is prekindergarten-12, and serves over 10,000 students in one academic year; and Organization 3 is K-12, and serves over 10,000 students in one academic year.

***Participant Groups' Professional Histories*.** Table 1 presents each educational communities' participant groups' professional histories. Generally, formal administrators and EE administrators had similar length of experience in an administrative position, however K-3 teachers were more experienced than EE educators.

Table 1
Participant groups' professional histories in years in an administrative role

		Years in administrative or educative role				
	N	Mean (SD)	Median	Mode	Min	Max
Formal Administrators	22	11.09 (6.53)	10.50	9.00	1.00	22.00
K-3 Teachers	51	18.06 (10.41)	18.00	25.00	3.00	44.00
EE Administrators	4	11.75 (3.30)	12.00	-	8.00	15.00
EE Educators	15	6.27 (8.75)	2.00	1.00	1.00	29.00

Measures

Questionnaires. Because each participant group (formal education administrators, K-3 teachers, EE administrators, and EE educators) had differing roles as outdoor play gatekeepers, four questionnaires were developed for each participant group to measure the constructs of beliefs regarding the benefits of student's outdoor play and beliefs toward cold weather. These questionnaires consisted of approximately forty question items, which were developed by the researcher, as well as adapted from literature (Brockman et al., 2011; Copeland et al., 2011; Larson, Green, & Castleberry, 2011; Ernst & Tornabene, 2014; Miles, 2008; Murray & Ramstetter, 2013; Rothe et al., 2009; Schultz et al., 2004, p. 31). Before the survey was distributed, it was reviewed by a committee of experts to verify face, content, and criteria validity. The committee was composed of three individuals with expertise in survey research, residential environmental learning centers, and K-12 formal education. After a field test in February 2015, amendments were made and sent on to the Institutional Review Board (IRB) for approval of distribution.

Across each questionnaire, there were 10 items that were designed to be participant-specific question to gain more information on a participant's professional history and institutional information. For example, EE administrator were asked, "How many years have you worked as an administrator of an environmental education organization?" (Q77), and formal education administrators were asked, "Q75. How many years have you worked as an administrator? (Q75).

***Beliefs regarding the benefits of outdoor play*.** Five items measured participants' beliefs regarding the benefits of outdoor play (Q12-Q18). Potential perceived benefits include academic performance, cognitive development, socio-emotional development, physical development, overall health, and environmental appreciation (Ernst & Tornabene, 2012). This construct was measured as participants' extent to which participants agreed with five statements regarding potential benefits of outdoor play for young children on a 5-point Likert scale, and reported as a composite score (p. 656).

***Beliefs toward cold weather*.** In this study, "beliefs toward cold weather" were divided and measured in four sub-constructs: cognitive, affective, self-efficacy, and normative. Cognitive beliefs were measured with semantic-differential items to report participants' reaction to stimulus words toward cold weather. Affective, self-efficacy, and normative beliefs were measured with a 5-point Likert scale to report participants' feelings and emotions, self-confidence, and social influences when it comes to cold weather. Within these cold weather belief items, participants asked to respond to similarly worded items, which had personal and professional gatekeeper vernacular; Item #28, stated, "I think cold weather is good/bad," and item #43 stated "For my students, cold weather is good/bad."

***Temperature Threshold*.** These sub-constructs are further supported with personal and gatekeeper responses toward personal and gatekeeper cold-temperature-thresholds. The questionnaires also included four items for participants to enter a temperature in degrees Fahrenheit (°F) for various temperature thresholds through their personal and gatekeeper lenses.

Data Collection Procedures

The questionnaire was distributed in April of 2015 via email to six non-formal EE administrators and 47 formal school administrators (district superintendents and school principals). With administrative consent, principals and EE administrators were invited to forward the survey hyperlink to their K-3 teachers or non-formal EE educators, respectively. Reminder emails to participate in the online survey were sent to all participants two times at one week intervals. A phone-call was made to formal and non-formal EE administrators after 10 days from the first initial email if there was no survey response. Reminder emails to forward the link to respective educators were made once, one week after completion of the survey.

At the completion of the first solicitation, the response rate of K-3 teachers was determined to be lower than what was representative of the possible sample. In September 2015, the survey was directly re-distributed to K-3 teachers in schools where principals provided consent.

Data Analysis

Microsoft Excel® and International Business Machines Corporation's (IBM) Statistical Package for the Social Sciences (SPSS®) were used to analyze survey data. Response rate was calculated, along with other descriptive values of mean and standard deviation. Composite scores were compared between educational settings (formal and non-formal EE) using independent-samples t-tests. Correlational analyses were conducted to investigate the relationships between participants' beliefs regarding the benefits of students' outdoor play and cognitive, gatekeeper beliefs toward cold weather. The data reporting of the correlation analyses were adapted from Hollenhorst and Ewert's (1985) Importance-Performance Matrix. Significance was determined to be at the $p<.05$ level, meaning for results that were significant, there was a 95% certainty that the true population's mean scores fell within the confidence interval.

RESULTS

Beliefs Regarding the Benefits of Students' Outdoor Play

Table 2 presents the central tendencies (mean and standard deviation) of participant groups' composite beliefs, as well as item scores regarding the benefits of students' outdoor play. Overall, both formal education and non-formal EE communities reported positive in their beliefs toward the benefits of outdoor play.

An independent-samples t-test was used to compare recognition of benefits to students' outdoor play by formal and non-formal educational community. Results are reported in Table 2. Beliefs regarding the benefits of outdoor play for developing students' environmental appreciation differed significantly between formal and non-formal EE participants, with non-formal participants in stronger agreement as to this important benefit of outdoor play than formal participants, $p=.022$.

Beliefs toward Cold Weather

Table 3 depicts formal and non-formal EE educational communities' personal and gatekeeper beliefs toward cold weather, compiled into four composite scores: cognitive beliefs, affective beliefs, self-efficacy beliefs, and normative beliefs. Of both personal and gatekeeper beliefs toward cold weather, non-formal EE participants generally reported more positive than formal education participants.

Independent samples t-tests were used to identify significant differences between formal educational and non-formal EE settings' personal and gatekeeper beliefs toward cold weather composite scores. As seen in Table 3, non-

formal EE participants' personal beliefs toward cold weather were statistically different than formal education participants in all four composites: cognitive, affective, self-efficacy, and normative beliefs. Non-formal EE participants' gatekeeper beliefs toward cold weather were also statistically different than formal education participants in cognitive and self-efficacy belief composite score.

Table 2
Independent samples t-test of formal education and non-formal EE participants' beliefs regarding the benefits to students' outdoor play by item

	Mean[a] (SD)			
Item	Formal	Non-formal EE	*t*(90)	*p*
Academic Performance	4.55 (.91)	4.74 (.56)	-.858	.393
Cognitive Development	4.51 (.94)	4.84 (.37)	-1.511	.134
Socio-emotional Development	4.52 (.96)	4.74 (.45)	-.953	.343
Physical Development	4.66 (.93)	4.95 (.23)	-1.341	.183
Overall Health	4.70 (.91)	5.00 (.00)	-1.441	.153
Environmental Appreciation	4.36 (1.10)	4.95 (.23)	-2.326	.022*
Composite of Items	**4.54 (.88)**	**4.87 (.20)**	**-1.575**	**.119**

Note. 5-point Likert scale. [a]1= Strongly disagree; 5= strongly agree. *denotes statistical significance, p< .05

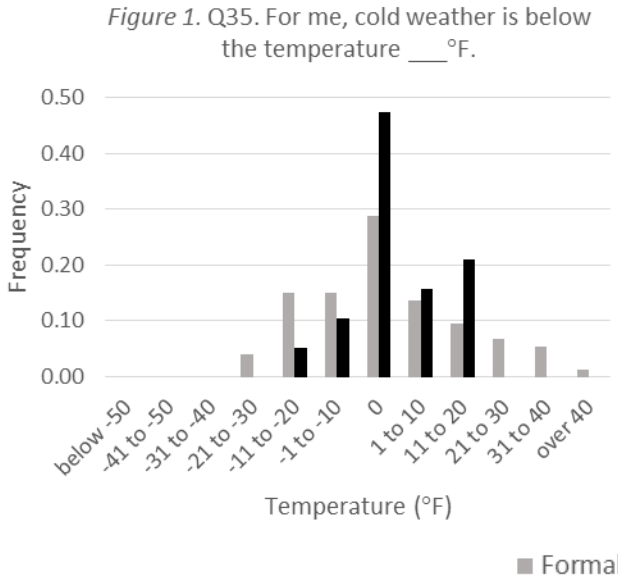
Table 3
Independent samples t-test of formal education and non-formal environmental education participants' personal and gatekeeper beliefs toward cold weather

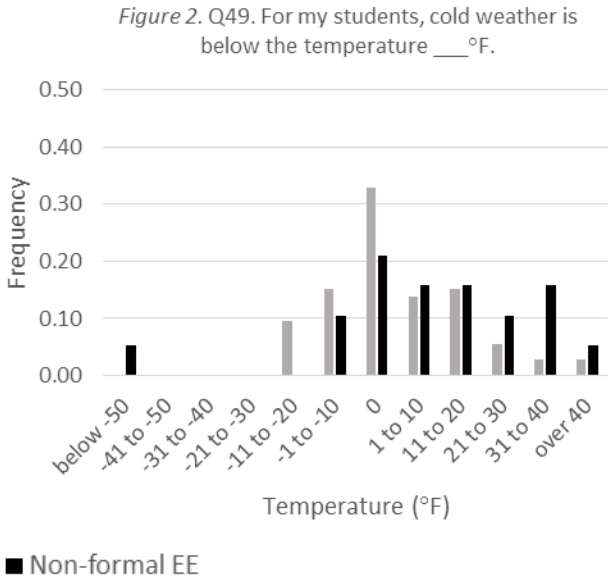
		Mean (SD)			
	Composite	Formal	Non-formal EE	t (90)	*p*
Personal Beliefs toward Cold Weather	Cognitive	3.11 (.77)	4.16 (.60)	-5.554	<.001*
	Affective	3.17 (1.11)	4.61 (.46)	-5.510	<.001*
	Self-Efficacy	4.30 (1.09)	5.00 (.00)	-2.785	.007*
	Normative	3.55 (.98)	4.27 (.56)	-3.074	.003*
Gatekeeper beliefs toward Cold Weather	Cognitive	3.06 (.66)	3.85 (.48)	-4.894	<.001*
	Affective	3.60 (.74)	3.81 (.71)	-1.126	.263
	Self-Efficacy	3.91 (.88)	4.79 (.42)	-4.192	<.001*
	Normative	3.68 (.53)	3.86 (.45)	-1.315	.192

Note. *denotes statistical significance, p< .05

Personal and Gatekeeper Perceptions toward Cold Temperatures

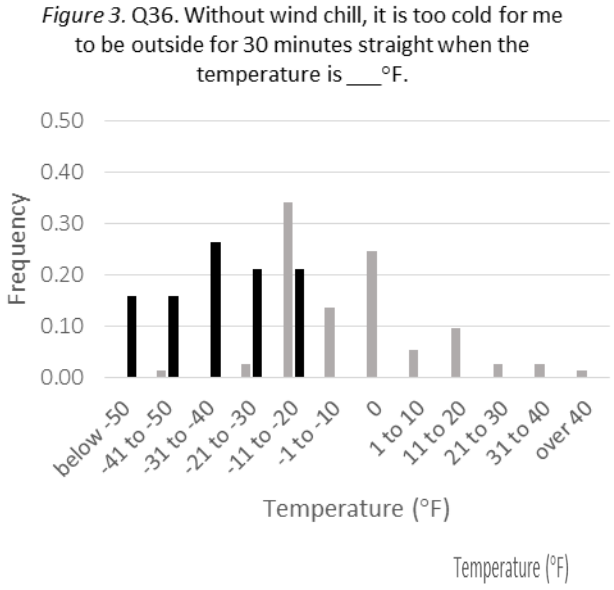
Figures 1-4 describe formal and non-formal EE participants' responses on personal and gatekeeper perceived temperatures (°F). Figures 1 and 2 depict similarities between educational settings' perceived temperatures of the threshold of what they personally and professionally constitute as a "cold weather" temperature.

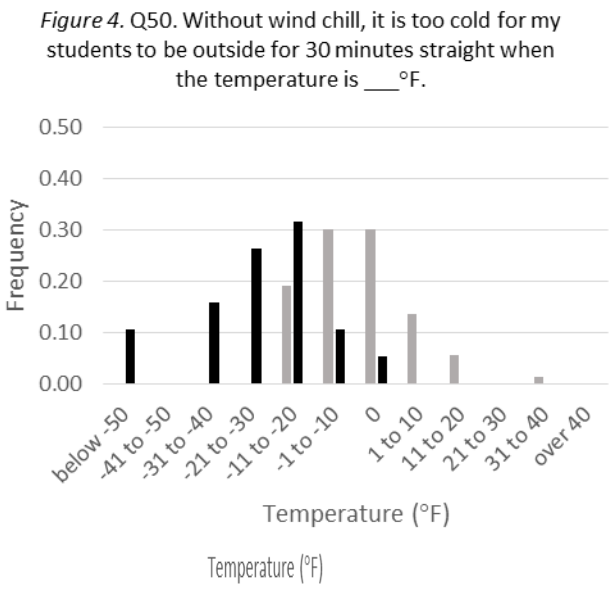




Figures 1 and 2. Frequency of formal and non-formal participants' personal (Figure 1) and professional (Figure 2) cold weather temperature threshold (items Q35 & Q49).

Figures 3 and 4, however, are generally more skewed, in that non-formal EE participants' responses show generally lower temperature thresholds than formal education participants, and similarly perceive their students' thresholds.





Figures 3 and 4. Frequency of formal and non-formal participants' personal (Figure 3) and professional (Figure 4) cold weather extreme temperature thresholds (items Q36 and Q50).

Relationship between Beliefs regarding the Benefits of Students' Outdoor Play and Cold Weather

For this section, Pearson's correlations are presented between educational communities' beliefs regarding the benefits of students' outdoor play and cognitive, gatekeeper beliefs toward cold weather.

Two Pearson's product moment correlations were computed to determine the relationship between the beliefs regarding the benefits of students' outdoor play and the composite score of cold weather, gatekeeper beliefs. As seen in Table 4, non-formal EE participants had a significant, positive correlation, r= .560, p=.013.

Adapted from Hollenhorst & Ewert's (1985) Importance-Performance Matrix, Figure 5 describes how each educational community responded in their beliefs regarding the benefits of students' outdoor play and cognitive, gatekeeper beliefs toward cold weather. Items in the positive, positive quadrant are rated highest in both constructs, suggesting gatekeepers may be successfully providing developmental opportunities for students in cold weather outdoor play. Items in the positive, negative; negative, negative; or negative, positive quadrants suggest students' developmental opportunities in outdoor play may have potential to be compromised in cold weather due to negative beliefs toward outdoor play and/or negative cognitive, gatekeeper beliefs toward cold weather.

Table 4
Pearson's product moment correlation of beliefs regarding the benefits of students' outdoor play and cognitive, gatekeeper beliefs toward cold weather

Participant Group	Beliefs regarding the benefits of Student's Outdoor Play		Cognitive, Gatekeeper Beliefs toward Cold Weather		Paired Samples Correlations	
	M	SD	M	SD	r	p
Formal	4.55	.88	3.06	.66	.202	.086
Non-formal EE	4.87	.20	3.85	.48	.560	.013*

Note. 5-point Likert scale. [a]1= more negative; 5= more positive. *denotes statistical significance, p< .05

Generally, both educational communities were positive in their beliefs regarding the benefits of outdoor play, though significant differences were present when it came to cognitive, gatekeeper beliefs toward cold weather.

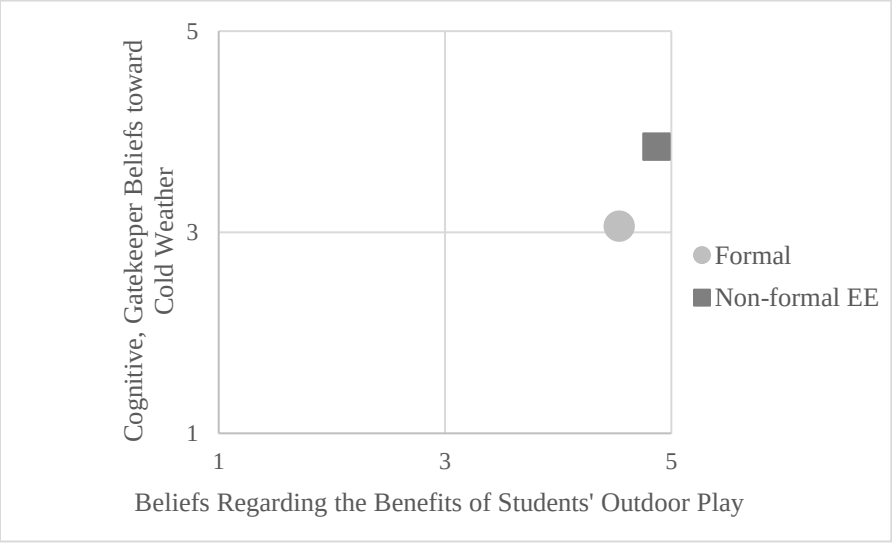


Figure 5. Scatterplot of the formal education and non-formal EE communities' composite scores of the beliefs regarding the benefits of students' outdoor play and cognitive, gatekeeper beliefs toward cold weather. The points

are as follows: Formal educational participants (4.54, 3.06), non-formal EE education participants (4.87, 3.85). Adapted from Hollenhorst and Ewert's (1985) Importance-Performance Matrix.

However, it is of significance to the author to exhibit these results by individual participants within each educational community. Figure 6 depicts how individuals from all four participant groups rate the benefits of outdoor play and their respective cognitive, gatekeeper beliefs toward cold weather. Twenty-eight (38%) of formal education participants and 20 (89%) of non-formal EE participants were in the positive, positive quadrant. Forty-five (62%) of formal education participants were in a positive, negative quadrant and negative, negative quadrant. Two (11%) non-formal EE participants were on the cusp of the positive, negative quadrant.

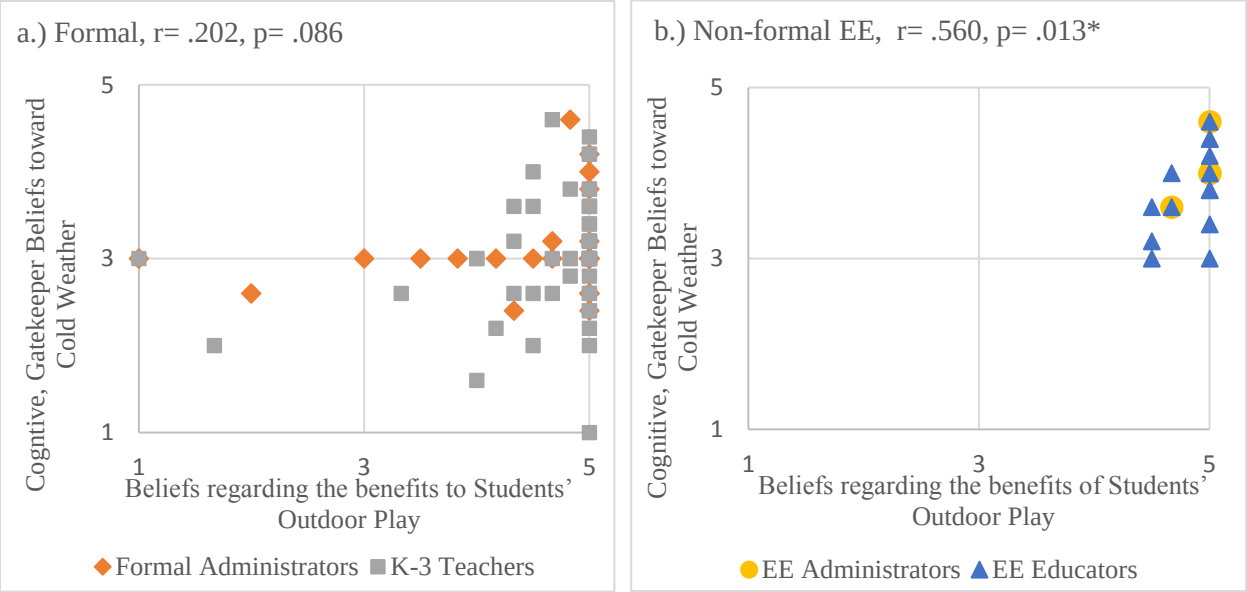


Figure 6. Scatterplot of each formal (a) and non-formal EE (b) participant groups' beliefs regarding the benefits of students' outdoor play and cognitive, gatekeeper beliefs toward cold weather. The Pearson's correlations are as follows: Formal administrators (r=.233, p=.297), K-3 teachers (r= .217, p= .127), EE administrators (r= .728, p= .272), EE educators (r= .526, p= .044*). *denotes statistical significance, p<.05. Adapted from Hollenhorst and Ewert's (1985) Importance-Performance Matrix.

DISCUSSION

This section discusses the emergent themes found in data analysis, and suggests supported implications of institutional gatekeepers' potential influences on the access to cold weather, outdoor play opportunities among students in early childhood.

Participant Demographics

Though eighteen of twenty public school districts, and 3 of 3 non-formal EE organizations with early childhood grade levels were represented, the sample population was not indicative to all formal education and non-formal EE communities in Northeastern Minnesota and therefore results are not and should not be generalized beyond this study. Careful suggestions of potential implications are shared.

Beliefs Regarding the Benefits of Students' Outdoor Play

For beliefs regarding the benefits of students' outdoor play, both formal and non-formal groups had overall, positive belief toward each benefit domain associated with outdoor play, suggesting that formal and non-formal gatekeepers

of this study positively recognize outdoor play to be an important vehicle for child development (Little and Wyver, 2008, p. 33). The positive rankings of positive benefits suggest formal and non-formal gatekeepers alike recognize that the domains of outdoor play benefits, which are perhaps, "interrelated and interdependent" (Dagli, 2012, p. 17).

Additionally, it is significant to note that one item, environmental appreciation, showed significant difference between formal and non-formal participants, as seen in Table 2. This finding suggests that perhaps non-formal EE participants perceive the professional emphasis that encourages students' environmental appreciation through outdoor play. As framed by their institutional influences, outdoor play may be characterized differently between formal and non-formal EE communities. The beliefs regarding the benefits of students' outdoor play, then, may be considered as more of a vehicle to achieving the varying institutional and developmental goals between formal education and non-formal EE communities.

Disparities between formal and non-formal EE participants' beliefs toward cold weather

When it comes to beliefs toward cold weather, generally, formal education participants' four composite scores, of both personal and gatekeeper beliefs, were less positive than non-formal EE participants' scores. As seen in Table 3, all four composite scores in personal beliefs toward cold weather and two composite scores in gatekeeper beliefs toward cold weather reported significant differences between educational communities in the independent-samples t-test. These findings can perhaps be better explained by other variables including, institutional influence, professional histories, weather-related play policies, and personal histories.

Institutional influence. As seen in Table 3, independent-samples t-tests revealed non-formal EE participants to be significantly different in personal cognitive, affective, self-efficacy, and normative beliefs, as well as cognitive, gatekeeper and self-efficacy beliefs compared to their formal education counterparts.

EE organizations in Northeast Minnesota are four season, year-round operations, with the academic year typically being the most marketed toward formal school community groups. Programs are typically rooted in students' outdoor experiences, whose educators have ample training and certification to do so in the elements. Each organization carries its own "unique conceptions of practice," where perhaps teaching in any element is emphasized within the non-formal EE culture, and therefore adopted as an attitude for that organization (Taylor & Caldarelli, 2004, p. 463). This may illuminate the findings from this study, in that non-formal EE administrators and EE educators are personally accustomed to cold weather, outdoor experiences, as well as are surrounded by peer and institutional influences, who have similar outdoor values and habits. Similarly, non-formal EE participants may also have more frequent, professional opportunities to facilitate and witness students' experiences in cold weather than formal education participants. The significant difference between self-efficacy, gatekeeper beliefs toward cold weather, then, may be due to non-formal EE's culture and training to teach students in outdoor, cold weather conditions.

Perceived Cold Temperatures. These differences in institutional influences between formal and non-formal EE communities can also be supported by the observations in Figures 4 and 5, in which non-formal EE participants reported lower perceived temperatures of what constitutes as "too cold." On the contrary, formal school institutions typically are more indoor-centric learning venues, with the outdoors used as active breaks or to support learning. Because of the locational differences, non-formal EE participants, perhaps, perceive themselves to be more positive and confident in cold weather, as their institutional influences in training and teaching may call for them to facilitate student learning in many types of outdoor experiences. Formal education participants, then, may have had fewer personal or gatekeeping outdoor opportunities in cold weather, as their institution calls for them to facilitate most student learning opportunities indoors.

Weather-related, outdoor play policies. Within institutional influences, policy for weather-related, outdoor play should also be reviewed. In this study, 14 formal administrators reported of having a minimum temperature in their weather related policies; the range of temperature was between 0° F and -18° F, and the average was -10.4° F. Of those 14 formal administrators and their respective schools and districts, there was a significant correlation between their professionally perceived temperature (Figure 4) and the minimum temperature policy of their school or district,

r= .859, p< .001, as seen in Figure 7. This finding invites future research to investigate how formal administrators perceive cold temperatures for their students and how minimum temperature policies are influenced and created.

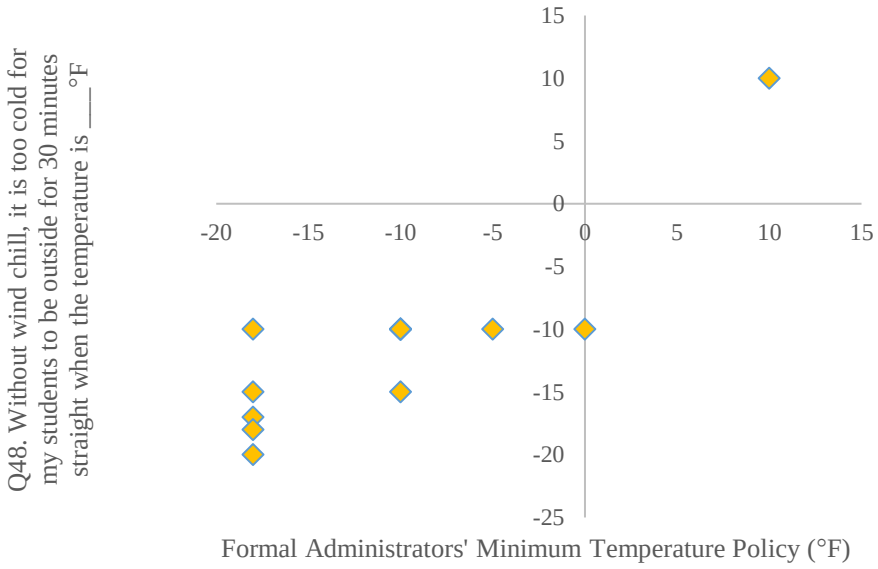


Figure 7. Relationship between formal administrators' minimum temperature policy and perceived temperature that is "too cold for students" (Q48). r=.859, p< .001

Within weather-related play policy, ideally, the number of days cancelled due to weather-related policy should reflect the temperature at which the policy is set. For example, a School with a -15°F policy would likely have fewer days of cancelled recess, compared to a school with a 15° F, during the average winter Northeast Minnesota. In this study, there was no significant difference between the number of days that recess was cancelled due to weather related reasons and the minimum temperature policy, r= .399, p= .158. This finding presents future studies to explore other site-specific considerations and influences that schools use during cold weather-related decision making.

For non-formal EE administrators, weather-related policies were varied, as were the number of days cancelled by the EE administrator or altered by the EE educator. Though contrasting policies and alternative requests, these findings are corroborated by Taylor and Caldarelli (2004), who stated,

> non-formal EE educators are called to reflect upon an "array of contextual factors, such as the audience, the environment…, time, institutional guidelines and expectations, and the weather and how they can often both compliment and conflict" with the visiting formal schools' attitudes and beliefs about cold weather outdoor play (p. 466).

This suggests that though weather-related policies may be in place for the formal school communities, and adapted to their institutional preference. Non-formal EE organizations, then, may be more often called to make alterative schedules and adjustments based upon individual school community's requests. Instead of overriding policy based on their beliefs or perceived cold temperatures, perhaps non-formal EE organizations are overriding their personal beliefs or professional policies to accommodate the visiting formal school community's beliefs, perceived cold temperatures, and policies.

Professional histories. Similarly, professional histories between formal and non-formal participant groups could also shed light on the differences between gatekeeper beliefs toward cold weather of formal and non-formal EE participants. Though K-3 teachers reported as more seasoned in years as an educator compared to EE educators,

there were no significant correlations between any participant group's years of experience in their educational role and the four gatekeeper cold weather belief composite scores, as seen in Table 5. That is, the longer a gatekeeper is in an administrative or educative position was not related to their beliefs toward cold weather.

Table 5
Relationship between years in an administrative or educative role and gatekeeper beliefs toward cold weather

		Gatekeeper beliefs toward Cold Weather			
		Cognitive Beliefs	Affective Beliefs	Self-Efficacy Beliefs	Normative Beliefs
Formal Administrators	Pearson's *r*	-.286	-.331	-.111	-.100
	p-value	.197	.133	.622	.658
K-3 Teachers	Pearson's *r*	.127	.111	.159	.075
	p-value	.375	.440	.266	.600
EE Administrators	Pearson's *r*	.648	.541	.353	.020
	p-value	.352	.459	.647	.980
EE Educators	Pearson's *r*	-.127	-.361	.252	-.391
	p-value	.652	.187	.364	.150

On a contrary note, this study did not survey participants on their professional histories in the opposing educational setting, such as a K-3 teachers' professional experience in the non-formal EE setting, or vice versa. More research on participants' professional histories in various educational settings may illuminate other variables that may influence beliefs toward cold weather.

Personal histories. Another suggestion of these disparities between educational communities' cold weather beliefs could also be explained by personal histories, such as time spent outdoors as a child, climate of origin, adult outdoor habitus, and so on. Though personal histories were not researched in this study, it is of significant to note the many possible variables, personal and professional, that may have influenced participants' cold weather beliefs (Rothe et al., 2009).

Gatekeepers' possible influences on early childhood students' cold weather, outdoor play

Adapted from Hollenhorst & Ewert's (1985) Importance-Performance Matrix, Figure 6 describes participants' possible strengths as a cold weather, outdoor play gatekeeper based on their beliefs regarding the benefits to students' outdoor play and cognitive, gatekeeper beliefs toward cold weather. As mentioned above, items in the positive, positive quadrant are rated highest in both constructs, suggesting gatekeepers are likely to successfully provide opportunities for cold weather outdoor play. Items in the positive, negative; negative, negative; or negative, positive quadrants suggest young students' developmental opportunities in outdoor play may have potential to be compromised in cold weather due to negative beliefs toward outdoor play and/or negative cognitive, gatekeeper beliefs toward cold weather.

Generally speaking, both educational communities' mean scores of beliefs regarding the benefits of outdoor play, and cognitive, gatekeeper beliefs toward cold weather fell in the positive, positive quadrant, suggesting that perhaps typically, formal and non-formal gatekeepers are positive gatekeepers for young students' outdoor play in cold weather, as seen in Figure 5. However, it is significant to note that participant group averages do not supersede an individual whose gatekeeping score may lie in the caution quadrants: positive, negative; negative, negative; or negative, positive.

In Figure 6, 45 formal education participants' (62%) and two non-formal EE participants' (11%) gatekeeping recognition fell in caution quadrants, positive, negative; negative, negative; or negative, positive, indicating the possibility of a cold weather, outdoor play gatekeeper who may have the potential to conditionally compromise young students' outdoor play based on cognitive, gatekeeper beliefs toward cold weather. Twenty-eight formal

education participants' (38%) and 20 non-formal EE participants (89%) fell in the positive, positive quadrant, and may be considered stronger cold weather, outdoor play gatekeepers, as they may have a lesser likelihood to conditionally or subjectively limit outdoor play based on their beliefs toward cold weather.

Though generally lacking weather-related policies, EE organizations' willing, confident, and inherently mandatory nature of teaching outdoors in the elements sparks a significant discussion: How can the non-formal community accommodate their customers from the formal school community who may have significantly less positive personal and gatekeeper beliefs toward cold weather?

Though perhaps countless, variables influence these beliefs of the formal education participants, a large, and growing body of literature are reiterating that children, especially of the early childhood level may not only be limited to their formal institution for outdoor play, but also may have limited opportunity to reap the development and resiliency benefits of outdoor play because of minimization measures made by their adult gatekeepers (Copeland, Sherman, Kendeigh, Kalkwarf, & Saelens, 2012b; Ergler et al., 2013; Little & Wyver, 2008). As winter in Northeast Minnesota may account for half of the academic year, it is significant to address the importance of all gatekeepers' influences on young students' opportunities for outdoor play in cold weather.

Strategies for Educational Gatekeepers

As gatekeepers' beliefs toward cold weather may influence development opportunities for students, what strategies can be taken to ensure those potential influences are geared toward positive opportunities for students' cold weather, outdoor play (Copeland, et al., 2011)? That is, how can gatekeepers, especially who may fall in those positive, negative; negative, negative; or negative, positive quadrants of potentially and conditionally limiting student's cold weather, outdoor play, be wholly encouraged and empowered to support young students' outdoor play, especially in cold weather? The following strategies are presented below of how gatekeepers can support young students' cold weather, outdoor play. Accepting the challenge to support young students' cold weather, outdoor play, not only enables the formal and non-formal environmental education fields to "contribute more effectively to reform," but also affords these fields to revisit their values (Wade, 1996, p. 16).

Investigate gatekeepers' perceptions and realities of students' risk management in cold weather. It is recommended that both school districts and EE organizations facilitate discussion to decipher between perception and reality when it comes to risk management in cold weather, and how to positively intersect beliefs and policies with outdoor play opportunities for students (Copeland, et al., 2011, p. 97). In cold weather outdoor play, gatekeepers can use these opportunities to introduce and reinforce positive risk taking, which provides numerous "opportunities for challenge, testing, limits, exploring boundaries, and learning about injury-risk" (Little et al., 2011, p. 115). Having the essential safety precursors of appropriate cold weather clothing addressed, students can have "access to and benefit from a wide range of stimulating and challenging outdoor play experiences" in cold weather (Little & Wyver, 2008, p. 39). And with ample and equitable opportunities in all four seasons of outdoor play, then, children can gain and apply "practical knowledge of how to behave within localities and seasons" (Ergler et al., 2013, p. 183; Copeland, et al., 2012a).

It is also recommended that non-formal EE communities host professional development opportunities regarding cold weather teaching and safety for parents, caregivers, and formal or non-formal gatekeepers, so they can learn to distinguish perceived and real risk when it comes to spending time outdoors in cold weather. Having the outdoors and elements as the classroom, the non-formal EE community can use their expertise in teaching in cold weather, as well as provide adequate safety training for weather-related decisions, or assessing weather-related illnesses or injury. As risk is an inherent feature of the outdoors, both the formal and non-formal EE communities can have valuable discourse in creating and upholding opportunities for students' cold weather, outdoor play.

Reclaim outdoor play in the formal school day. As outdoor play opportunities decline, perhaps this is a louder call to formal education communities to take the responsibility of supporting recess, which may be students' only active, outdoor time, especially in winter, when at-home activity levels tend to drop. It is encouraged that the formal school communities recognize and evolve with the growing pressures and need to provide outdoor recess, which may be a

student's single, daily opportunity to be outdoors (Beighle, Erwin, Morgan, & Alderman, 2012, p. 106). Thus, young students' outdoor play should not just be viewed as a vehicle to enhance physical fitness, but rather a means to shape their "year-round well-being" and resiliency, among other identified benefits (Ergler, et al., 2013, p. 183; Ginsburg, 2006).

Establish weather-related policies in pragmatic, scientific research. Especially working with early childhood students, weather–related outdoor play decisions may be influenced by not only gatekeepers' beliefs toward cold weather, but perhaps more by student demographic considerations, such as access to cold weather clothing. "Approaches to policy need to draw a distinction between excessive risk and positive, healthy risk" (Little et al., 2011, p. 127). As early childhood students may be more dependent on their families to provide the necessary equipment for cold weather outdoor play, it is recommended that educational communities implement equitable resources and opportunities for all students to feel and be safe in cold weather, and thus, be mentally and physically equipped to reap the benefits of outdoor play.

With the use of a pragmatic weather-related outdoor play policy based around an index that provides a scientific and safety standard, gatekeeper's conditional decision-making may be more strongly regulated to increase students' opportunities for outdoor play in cold weather, and decrease the potential for gatekeeper to supersede the institution's policy based on personal beliefs, while positively increasing both gatekeepers' and young students' cognitive, affective self-efficacy, and normative beliefs toward cold weather outdoor play.

CONCLUSION

To date, this area of study has received limited research attention from the field of environmental education and early childhood, though has drawn on a number of publications across various disciplines. The findings from this study open up a number of avenues for further research.

This study presented the potential disparities between young children's outdoor play gatekeepers within the formal education and non-formal EE communities. The parallels between formal education and non-formal EE are strong foundation of value in early childhood development, where both communities recognize the benefits of outdoor play for young children. However, the intersection at which individuals' cold weather beliefs and benefits of outdoor play meet are cause for further investigation, especially within the formal education community.

Because growing evidence suggests students' outdoor play is limited to a child's school day or childcare, further research is needed to understand how weather-related, outdoor play policies in schools and childcare institutions are created, and if they are based on an index that has both scientific and public safety credentials, or left to a gatekeeper's discretion. In corroboration of other studies, more research is also needed to understand how parent beliefs about how cold weather may influence children's opportunities for outdoor play (Copeland et al., 2011, p. 5).

Since this study was limited to the Northeast region of Minnesota, restrictions are imposed on the study's external validity, and thus, is unable to make generalizations of participants in other regions or of the state of Minnesota. Replication of this study in similar 4-seasons areas is needed to understand how gatekeepers' beliefs toward cold weather in other regions may influence students' opportunities for outdoor play. Similarly, a study on gatekeeper beliefs toward other extreme weather conditions like hot, dry, or wet will also illuminate how gatekeepers perceive a variety of extreme conditions for their young students' outdoor play compared to cold weather.

Outdoor play opportunities cultivate long-term results for young children "that can be transferred to adulthood" (Eyler, et al., 2010, p.327). For a temperate, four season climate like Northeast Minnesota, it is encouraging given that the majority of participants of this study reported positive beliefs regarding the benefits of young students' outdoor play. However, over half of all participants in this study had more negative, gatekeeper beliefs toward cold weather, which suggests the subjective limitation of young students' outdoor play opportunities for a significant portion of the academic year. As an influential determinant of outdoor play, weather is not a modifiable factor, but perhaps individual perception about weather could be changed (Chan, C., Ryan, D., Tudor-Locke, C. 2006). If students' outdoor play opportunities are to be supported, then all gatekeepers and their respective institutions are

strongly encouraged and challenged to contribute more effectively to students' year-round, outdoor play opportunities. Ultimately, for students to reap the interrelated and long-term benefits from year-round, outdoor play opportunities, gatekeepers and institutions must individually and collectively, critically and repeatedly, advocate for early childhood outdoor play opportunities, especially in cold weather, to build lifelong resiliency (Ginsburg, 2006; Little & Wyver, 2008; Wade, 1996).

References

Babbie, E. (2011). The basics of social research. Belmont: Wadsworth.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health*. San Diego: Academic Press, 1998).

Beighle, A., Erwin, H., Morgan, C. & Alderman, B. (2012). Children's in-school and out-of school physical activity during two seasons. *Research Quarterly in Sport and Exercise*. 83(1), 103-107.

Bélanger, M., Gray-Donald, K., O'Loughlin, J., Paradis, G., & Hanley, J. (2009). Influence of weather conditions and season on physical activity in adolescents. Annals of Epidemiology, 19(3), 180–186.

Brewer, M. & Kimbro, R.T. (2014). Neighborhood context and immigrant children's physical activity. *Social Science and Medicine*, *116*, 1-9.

Brockman, R., Fox, K. R., & Jago, R. (2011). What is the meaning and nature of active play for today's children in the UK? *The International Journal of Behavioral Nutrition and Physical Activity*, *8*(15), 1–7.

Brown, S. & Vaughan, C. (2009). Play: how it shapes the brain, opens the imagination, and invigorates the soul. New York: Penguin Group (USA) Inc.

Chan, C., Ryan, D., Tudor-Locke, C. (2006) Relationship between objective measures of physical activity and weather: a longitudinal study. *International Journal of Behavioral Nutrition and Physical Activity*. *3*:21.

"Cognitive belief system." (2017). BusinessDictionary.com. Retrieved May 16, 2017, from BusinessDictionary.com website: http://www.businessdictionary.com/definition/cognitive-belief-system.html

"Cold." (2014). In Merriam-Webster.com. Retrieved from http://www.merriam-webster.com/dictionary/cold

Copeland, K.A., Kendeigh, C., Saelens, B.E., Kalkwarf, H.J., & Sherman, S.N. (2012a). Physical activity in child-care centers: do teachers hold the key to the playground? *Health Education Research*, *27*(1), 81–100.

Copeland, K.A., Sherman, S.N., Kendeigh, C., Kalkwarf, H. J., & Saelens, B.E. (2012b). Societal values and policies may curtail preschool children's physical activity in child care centers. *Pediatrics*, *129*(2), 265–74.

Copeland, K.A., Sherman, S.N., Khoury, J.C., Foster, K.E., Saelens, B.E., & Kalkwarf, H.J. (2011). Wide variability in physical activity environments and weather-related outdoor play policies in child care centers within a single county of Ohio. *Archives of Pediatrics & Adolescent Medicine*, *165*(5), 435–42.

Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches. Los Angeles: Sage.

Dagli, U.Y. (2012). Recess and reading achievement of early childhood students in public schools. *Education policy analysis archives, 20*(10)/ 1-23.

Ellinger, A. (1997). Managers as facilitators of learning in learning organizations. Unpublished Doctoral Dissertation, University of Georgia, Athens, GA.

Ergler, C. R., Kearns, R. A., & Witten, K. (2013). Seasonal and locational variations in children's play: Implications for wellbeing. *Social Science & Medicine*, *91*, 178–185.

Ernst, J., & Tornabene, L. (2012). Preservice early childhood educators' perceptions of outdoor settings as learning environments. *Environmental Education Research*, *18*(5), 643–664.

Eyler, A.A., Brownson, R.C., Aytur, S.A., Cradock, A.L., Doescher, M., Evenson, K.R., Kerr, J., Maddock, J., Pluto, D.L., Steinman, L., O'Hara-Tompkins, N., Troped, P., Schmid, T.L. (2010). Examination of trends and evidence-based elements in state physical education legislation: A content analysis. *Journal of School Health, 80*(7). 326-332.

Flay, B. (2014). Normative beliefs. Oregon State University. Retrieved May 16, 2017, from http://people.oregonstate.edu/~flayb/MY%20COURSES/H571%20Principles%20of%20Health%20Behavior%20Fall%202014/Readings/NCI%20Trafimow%20on%20Normative%20Beliefs.pdf

Ginsburg, K. R. (2006). The Importance of Play in Promoting Healthy Child Development and Maintaining Strong Parent-Child Bonds. *Pediatrics*, *119*(1), 182–191.

Heimlich, J.E. (1993). Non-formal environmental education: Toward a working definition. The Environmental Outlook.

Hollenhorst, S. & Ewert, A. (1985). Importance-performance evaluation: A method of discerning successful program components. *Paper presented at American Camping Association Convention, Atlanta, Georgia.* 1985-03-13.

Humpel, N., Owen, N., Iverson, D., Leslie, E., & Bauman, A. (2004). Perceived environment attributes, residential location, and walking for particular purposes. *American Journal of Preventive Medicine*, *26*(2), 119–125.

Kos, M. & Jerman, J. (2013) Provisions for outdoor play and learning in Slovene preschools, Journal of Adventure Education and Outdoor Learning, 13(3), 189- 205.

Kukaswadia, A., Pickett, W., & Janssen, I. (2014). Time since immigration and ethnicity as predictors of physical activity among Canadian youth: a cross-sectional study. *PloS One*, *9*(2).

Larson, L. R., Green, G. T., & Castleberry, S. B. (2011). Construction and Validation of an Instrument to Measure Environmental Orientations in a Diverse Group of Children. *Environment and Behavior*, *43*(1), 72–89.

Little, H., & Wyver, S. (2008). Outdoor play: Does avoiding the risks reduce the benefits? *Australian Journal of Early Childhood*, *33*(2), 33–40.

Miles, R. (2008). Neighborhood disorder, perceived safety, and readiness to encourage use of local playgrounds. *American Journal of Preventive Medicine*, *34*(4), 275–81.

Mitra, R., & Faulkner, G. (2012). There's no such thing as bad weather, just the wrong clothing: Climate, weather and active school transportation in Toronto, Canada. *Canadian Journal of Public Health*, *113*(3), 535-541.

Murray, R., & Ramstetter, C. (2013). The crucial role of recess in school. *Pediatrics*, *131*(1), 183–188.

Rothe, E., Holt, C., Kuhn, C., McAteer, T., Askari, I., O'Meara, M., & Dexter, W. (2009). Barriers to outdoor physical activity in wintertime among Somali youth. *Journal of Immigrant and Minority Health / Center for Minority Public Health*, *12*(5), 726–36.

Schultz, P.W., Shriver, C., Tabanico, J.J., Khanzian, A.M. (2004). Implicit connections with nature. *Journal of Environmental Psychology*, *24*, 31-42.

Slater, S. J., Nicholson, L., Chriqui, J., Turner, L., & Chaloupka, F. (2012). The impact of state laws and district policies on physical education and recess practices in a nationally representative sample of US public elementary schools. Archives of Pediatrics & Adolescent Medicine, 166(4), 311–6.

Stanley, R. M., Boshoff, K., & Dollman, J. (2012). Voices in the playground: a qualitative exploration of the barriers and facilitators of lunchtime play. Journal of Science and Medicine in Sport / Sports Medicine Australia, 15(1), 44–51.

Tandon, P.S., Zhou, C., Christakis, D.A. (2012). Frequency of parent-supervised outdoor play of US preschool-aged children. Archives of Pediatric Adolescence Medicine, 166(8), 707-712.

Taylor, E., & Caldarelli, M. (2004). Teaching beliefs of non-formal environmental educators: a perspective from state and local parks in the United States. *Environmental Education Research*, *10*(4), 451–469.

Veitch, J., Bagley, S., Ball, K., & Salmon, J. (2006). Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health & Place*, *12*(4), 383–93.

Wade, K.S. (1996). EE teacher inservice education: The need for new perspectives. *Journal of environmental education, 27*(2), 11-17.

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