



# Influence of educator's emotional support behaviors on environmental education student outcomes

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## ABSTRACT

Environmental education (EE) aims to create environmentally literate individuals that have the knowledge, skills, and dispositions to solve important environmental issues. However, little research examines whether and which educator's emotional support behaviors, such as responsiveness and positive communications, enhance outcomes in an EE program. Utilizing student surveys, programmatic observations, and qualitative notes collected from 334 EE field trip programs for fifth through eighth grade students (ages 9–12) provided by 90 different organizations across the U.S., this study examined linkages between educator's emotional support behaviors and positive learning outcomes. Past research in formal educational settings suggests that emotional support behaviors yield positive outcomes for students. This research also found that positive emotional support behaviors positively influenced student outcomes and explained 10% of the variance. Based on the resulting model, we suggest that positive emotional support behaviors should be considered in future environmental educator training programs.

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## Introduction

Environmental education (EE) is aimed at developing individuals that understand environmental issues and have the skills and dispositions to use this knowledge to make informed decisions to address these problems (Ardoin, Biedenweg, and O'Connor 2015; Hofstein and Rosenfeld 1996; NAAEE 2012; Stern, Powell, and Ardoin 2008). Currently there are many recommended pedagogical practices and approaches, such as using hands on and place-based techniques, that are thought to improve programs and help achieve these outcomes (NAAEE 2012; Stern, Powell, and Hill 2014). However, specific educator actions that build feelings of emotional support, such as eye contact, supportive communications, acknowledgement of participants' needs, as well as educator's passion and sincerity are overlooked in EE research despite theory and evidence from formal education research that suggests these actions enhance learning outcomes (Hamre and Pianta 2005; Merritt et al. 2012; Pianta, La Paro, and Hamre 2008; Reyes et al. 2012; Rudasill, Gallagher, and White 2010). Therefore, this study addresses the following research question: Does educator's use of emotional support building behaviors influence student learning

outcomes in EE field trip programs? To answer this question, we systematically observed educator's behaviors associated with 334 EE field trip programs for youth (grades 5–8; ages 9–12) provided by 90 different organizations across the U.S. and conducted surveys with program participants to assess learning outcomes related to Learning, Interest in Learning, 21st Century Skills, Self-Identity, Self-Efficacy, Place Attachment, Environmental Attitudes, Environmental Behaviors, Cooperation/Collaboration Behaviors, and School Behaviors.

## Literature review

### *Environmental education*

According to the Tbilisi Declaration (UNESCO 1977), EE should enhance a range of outcomes for participants including awareness, knowledge, attitudes, skills, and behaviors to address environmental issues. Today these outcomes are often referred to as environmental literacy, which includes awareness, knowledge, attitudes, and stewardship behaviors that extend beyond the program and continue to influence participants after returning to their communities (Stern, Powell, and Ardoin 2008; Ardoin, Biedenweg, and O'Connor 2015; Hofstein and Rosenfeld 1996; NAAEE 2012). However, for school EE field trips additional outcomes are also relevant and important and include enhancing academic performance and positive youth development outcomes such as 21st century skills, meaning/self-identity, self-efficacy, school and communication behaviors (Ardoin, Biedenweg, and O'Connor 2015; Ardoin 2006; Bowers et al. 2010; Powell et al. 2011, 2019; Stern, Powell, and Hill 2014; Storksdieck, Ellenbogen, and Heimlich 2005).

Youth EE programs, particularly those associated with school field trips, reside at a critical intersection between formal and informal education (Storksdieck 2006). High quality informal education is student led and student-centered, immersive, experiential, and takes place in an out-of-school context in less structured environments where learning is intrinsically motivated and participation is generally voluntary (Gerber, Marek, and Cavallo 2001; Hofstein and Rosenfeld 1996). In traditional formal education settings, teachers often initiate learning, attendance is mandatory, motivation is often extrinsic, and some form of assessment after instruction is expected (Gerber, Marek, and Cavallo 2001).

EE field trips for school children possess characteristics of both informal and formal education. Field trips are undertaken for educational purposes that often support classroom learning, but they take place in informal settings where educators facilitate a more student-centered experiences in which students directly engage and co-create content and there is no formal evaluation (DeWitt and Storksdieck 2008; Feher 1990; Hofstein and Rosenfeld 1996; Storksdieck 2006). On-site educators facilitate students' learning on field trips in multiple ways. As is the case with classroom teachers, they can also take on multiple personas and interact with the students in various ways. In many cases, they can serve as deeply personal facilitators, co-producing knowledge alongside students through shared experiences. In others, they might simply convey information through more traditional lecture-style presentations. Thus, we focused this study on the influence educators for shaping EE field trips with a particular emphasis on programs for grades 5–8 (ages 9–12).

Students in grades 5–8 were studied for this research because research suggests that middle childhood age children begin to advance in their moral and cognitive development (Dewey 1899; Kohlberg 1971; Piaget 1936), shifting from the approval-seeking reasoning associated with elementary age students, to higher levels of moral reasoning (Eisenberg et al. 1987; Kohlberg 1971). Cognitive development also advances during these years, as children grow to think concretely and logically, and then develop the ability to think abstractly (Piaget 1936). These higher levels of decision making and thinking represent a key transition in which middle school aged youth can effectively begin to develop 21st century skills and an affinity with nature (Dewey

1899; Erikson 1994; Kahn and Kellert 2002; Sobel 2002), thus making this an important and relevant age for this study considering the commonly targeted outcomes of EE field trips.

### ***Environmental education guidelines***

The North American Association for Environmental Education (NAAEE) released *Guidelines for Excellence* to promote practices and approaches that advance the goals and improve the provision of EE (NAAEE 1999, 2012). Developed by consensus of researchers and practitioners, the 'guidelines' promote best practices in the field to yield high quality programs (Ardoin, Clark, and Kelsey 2013; NAAEE 2012; Stern, Powell, and Hill 2014). However, the NAAEE guidelines overlook emotional support behaviors and practices. Similarly in the informal education and EE literature, few studies have investigated whether the use of greater degrees of positive emotional support behaviors enhance student learning outcomes (Stern, Powell, and Hill 2014).

### ***Emotional support and emotional support behaviors***

In formal educational settings, enhancing emotional support has been shown to enhance retention (Hamre and Pianta 2005), learning (McCroskey et al. 1995; Finn et al. 2009), and classroom attention (Rudasill et al. 2010). According to Pianta and Hamre (2009) two theories, self determination theory and attachment theory, support the importance of emotional support behaviors. Research using self determination theory suggests that when teachers use emotional support behaviors to empower students to make decisions (enhancing feelings of autonomy), provide supportive feedback (enhancing feelings of competence), and establish an inclusive and positive social environment (enhancing feelings of relatedness), students are more motivated to learn, demonstrate increased social-emotional and task oriented skills (e.g. Ryan & Deci 2000; Pianta 1999; Frenley et al. In review), and develop stronger interpersonal relationships (Krumholz et al. 1998; Langford et al. 1997; Slevin et al. 1996). Attachment theory (e.g. Ainsworth et al. 1978) suggests that when teachers provide positive and supportive communications, consistent and responsive interactions, and an emotionally safe environment, students perform better academically and are more self reliant (Pianta 1999; Pianta and Hamre 2009). These theories underpin the influence of emotional support behaviors on student learning outcomes during EE field trip programs.

Research suggests that building emotional support occurs when classroom educators make eye contact, offer guidance and support, use a calm voice, demonstrate care and respect, and are responsive to student's needs (Hamre and Pianta 2005; Merritt et al. 2012; Rudasill et al. 2010). In informal educational settings, a recent study of short-duration (1 day or less) interpretative programs for adults identified specific emotional support building behaviors, such as educator's sincerity and passion, as having strong positive correlations with visitor outcomes (Powell and Stern 2013; Stern and Powell 2013), demonstrating the potential of emotional support behaviors for enhancing outcomes in EE field trip programs for youth. However, few studies have focused on EE programs for youth and the influence of educator's performance of emotional support behaviors.

Research using observations of educators' behaviors have been used to assess their influence on student performance for more than 40 years (Gage and Needels 1989; Pianta and Hamre 2009). Initial observational efforts either took a qualitative approach or focused on the frequency/amount of a particular behavior and their relationships to student achievement. More recently standardized approaches to teacher observations in formal classrooms have taken two different forms to ensure validity and reliability. A time-sampling approach has been used to capture specific teacher behaviors at discreet time intervals (e.g. Classroom Observation System: NICHD ECCRN 2002, 2004; Dimensions of Success: Noam and Shah 2018; Allen et al. 2019).

A more global approach has also been used to rate the overall qualities of educator-student interactions during an observed period of time, such as a school day (e.g. CLASS: Pianta, La Paro, and Hamre 2008; Teacher Effectiveness Summary Rating Form: Stronge et al. 2008, Stronge, Ward, and Grant 2011). Both approaches have been used at varying scales, including large cross-classroom studies, to isolate the relative influence of different dimensions of teacher behaviors that most strongly influence student achievement (e.g. Stronge, Ward, and Grant 2011) and social-emotional learning among others (e.g. Hamre and Pianta 2005). Researchers suggest that while each of these techniques (time-sampling of discrete behaviors vs. global observations) can be standardized to ensure relatively consistent observational scoring between researchers, the global ratings appear more stable across a school day for a particular teacher and thus better capture the qualities of behaviors and the classroom environment. Meanwhile, time-sampling scoring varies more due to the time of observation and what was occurring in the classroom in that discrete moment (see Pianta and Hamre 2009; Gage and Needels 1989).

To measure the global qualities of the educator-student interactions, we adapted the Classroom Learning Assessment Scoring System, which specifically operationalizes the observational measurement of emotionally supportive behaviors (Pianta and Hamre 2009).

### ***The classroom learning assessment scoring system and emotional support***

The Classroom Learning Assessment Scoring System (CLASS) is an observational assessment tool that has been utilized to evaluate teachers in formal classroom settings serving students of varying ages (Allen et al. 2013; La Paro, Pianta, and Stuhlman 2004), minority groups (Downer et al. 2012), and locations (Pakarinen et al. 2010). CLASS focuses on three teaching domains: emotional support, classroom organization, and instructional support (Pianta and Hamre 2009). Each of these domains is further divided into sub-dimensions with corresponding behavioral indicators, which allow for direct observation of specific behaviors (Figure 1). The emotional support domain of CLASS, the focus of this research, is subdivided into positive climate, negative climate, teacher sensitivity, and regard for student perspective. Each is operationalized using several indicator behaviors measured on a 1–7 point scale (Pianta and Hamre 2009). Indicators of positive climate include behaviors related to positive affect, positive communications, respectful language, and cooperation and/or sharing. As part of positive climate, CLASS measures the presence or absence of warm and supportive interactions between students and teachers (Merritt et al. 2012). Research shows that students in classrooms high in positive climate and low in negative climate engage more in learning (Furrer and Skinner 2003) and exhibit fewer negative behaviors (Crosnoe, Johnson, and Elder 2004). The indicators for negative climate include behaviors related to negative affect, punitive control, sarcasm/disrespect, and severe negativity such as the use of yelling, threats, physical control, and harsh punishment. The indicators of teacher sensitivity include behaviors related to awareness and responsiveness (Pianta and Hamre 2009). The indicators for the regard for student perspectives include behaviors related to flexibility, support for autonomy, leadership, and student expression (Pianta and Hamre 2009).

## **Methods**

This study aimed to examine linkages between educators' use of emotional support behaviors and positive learning outcomes for middle school aged students (grades 5–8; ages 9–12) attending EE day field trips in the U.S. This data collection was a part of a larger study designed to examine the linkages between a range of pedagogical approaches and programmatic characteristics and positive student learning outcomes. Data were collected at 346 EE field trip programs using post-program student surveys, quantitative observational measurements, and qualitative notes. Four pairs of researchers collected data from January through June 2018.

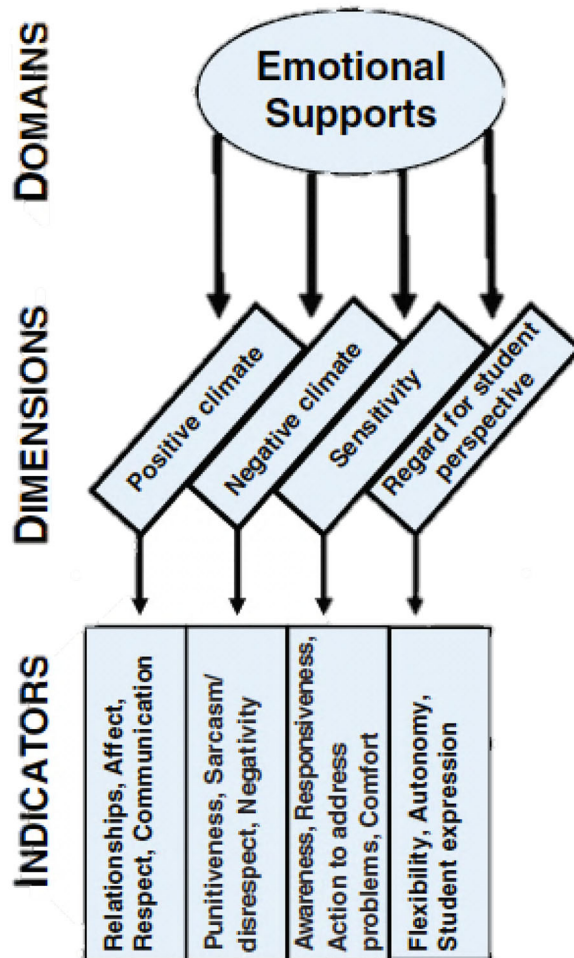


Figure 1. The CLASS conceptual framework for emotional support for classroom interactions (Pianta and Hamre 2009).

### ***Selection of sites***

This study focused on Science, Technology, Engineering, and Mathematics (STEM)-related EE day field trips for middle school aged students (grades 5–8) in the U.S. Organizations that provided field trip programs included national, state, and local parks, nature centers, botanical gardens, wildlife reserves, farms, public forests, science museums, and other environmental organizations. Working with North American Association of Environmental Education (NAAEE), the U.S. National Park Service (NPS), and the Association of Nature Center Administrators (ANCA), we attempted to identify as many organizations as possible who offered single day EE focused field trip programs for students, grades 5–8 across the U.S. To systematically select programs, we divided the states into quartiles based on Ruggiero’s (2016) evaluation of Environmental Literacy Plans in the US, which ranked states in terms of the status and quality of their statewide Environmental Literacy Plans. We then systematically sampled at least 10 program providers from states in each quartile to ensure a diversity of programs.

We identified over 300 potential program providers across all four quartiles. After contacting each potential provider, we identified organizations that had programs occurring during the period of research and were willing to participate in the study (Jan–June 2018). We then identified clusters of program providers in different regions of the country. Four pairs of researchers then visited these different regions to maximize sample size.

## **Data collection**

We observed 345 programs from 90 unique program providers. Upon arrival at a program site, researchers collected basic information about the program including time, location, topic focus, educator's experience level, group size, and grade level. During each program, researchers maintained an unobtrusive presence and systematically monitored the extent and quality to which program characteristics, including educators use of emotional support behaviors, were displayed during the program. This included recording quantitative scores related to global measures of emotional support behaviors as well as other programmatic characteristics and qualitative notes immediately following each program. Immediately following each program, all attending students were invited to complete a survey pertaining to the program and its influence on them. The average completion time was approximately 8 min. From the 345 observed programs we collected 5,317 surveys.

We developed and refined all data collections procedures including observational methods through extensive pilot testing. This included prior research on interpretive programs in U.S. National Parks (Stern and Powell 2013) and at NorthBay Adventure Education Center in Maryland where we observed 81 lessons and 17 different educators (Frensley, Stern, and Powell 2020). Additional piloting of methods occurred at 17 field trip programs with the full research team where each researcher completed the observational scoring. After each of these programs we then compared and discussed at length any discrepancies in scoring and clarified the operational definitions and/or measurement of each programmatic element under consideration to develop consistent, reliable, and valid scoring of all observations across the eight field researchers.

For the first two weeks of program observation, pairs of researchers observed programs together and completed scoring independently. The pairs of researchers then reviewed and discussed any discrepancies in order to reach consensus and complete final scoring for the program to ensure reliability and consistency in scoring of observational variables. After two weeks, discrepancies were rare. Researchers then began to observe programs individually. Throughout data collection researchers periodically attended programs together to ensure reliability and consistency in observational scoring. Team members also participated in weekly calls to ensure consistency in observation techniques and to clarify any questions about scoring certain variables. At three points over the course of the study, we altered the pairing of researchers and observed programs together to further enhance the reliability of observation measures.

## **Measurement**

**Outcomes:** All students attending an EE field trip program completed a retrospective survey composed of the Environmental Education Outcomes for the 21st Century (EE21) scales, which were developed with extensive collaboration and review by the EE field and following scale development procedures recommended by DeVellis (2003) and others (see Powell et al. 2019 for details). This also included pilot testing of EE21 across 6 different EE settings and subsequent psychometric testing including cross-validation using confirmatory factor analyses and multi-group invariance procedures (Powell et al. 2019). EE21 is comprised of 10 scales that measure outcomes identified by the field as relevant and important (Place Attachment, Learning, Interest in Learning, 21st Century Skills, Self-Identity, Self-Efficacy, Environmental Attitudes, Environmental Behaviors, Cooperation/Collaboration Behaviors, and School Behaviors) (Table 1). Place Attachment, Learning, Interest in Learning, 21st Century Skills, Self-Identity, Environmental Behaviors, Cooperation/Collaboration Behaviors, and School Behaviors were measured using retrospective questions asking students to reflect on how much the program influenced them and all items were scored on a 11 point likert-type scale: 0 = not at all, the midpoint = a fair amount/somewhat agree; and 10 = a huge amount/strongly agree depending on question. Self-Efficacy and Environmental Attitudes were measured using a retrospective pre/post questions

**Table 1.** Environmental education outcomes for the 21st century (Powell, et al., 2019)

Environmental education outcomes for the 21st century (EE21)		
Outcome	Definition	Items
Connection/Place attachment	Appreciation and personal connection with the physical location of the program.	Knowing this place exists makes me feel good. I want to visit this place again. I care about this place.
Learn	Enhanced knowledge regarding the interconnectedness and interdependence between human and environmental systems.	How different parts of the environment interact with each other. How people can change the environment. How changes in the environment can impact my life. How my actions affect the environment.
Interest in learning	Enhanced curiosity, as well as increased interest, in learning about science, the environment, or civic engagement.	Science. How to research things I am curious about. Learning about new subjects in school.
21 <sup>st</sup> century skills	Enhanced skills in critical thinking and problem solving; communication; collaboration; and creativity and innovation.	Solving problems Using science to answer a question Listening to other people's points of view Knowing how to do research
Meaning/Self identity	Impact of the program on components of participants' identities. These may include a heightened sense of purpose, motivation, or identity.	Taught me something <u>that will be useful to me in my future.</u> Really made me think. Made me realize something I never imagined before. Made me think differently about the choices I make in my life. Made me curious about something.
Self-efficacy	Changes in individuals' belief in their ability to achieve their goals and influence their environment.	I believe in myself I feel confident I can achieve my goals I can make a difference in my community.
Environmental attitudes	Changes in sensitivity, concern, and dispositions towards the environment	I feel it is important to take good care of the environment Humans are a part of nature, not separate from it. I have the power to protect the environment Help to protect the environment. Spend more time outside. Make a positive difference in my community. Listen more to other people's points of view. Cooperate more with my classmates.
Actions: Environmental stewardship	Enhanced desire/intentions to address environmental and social problems in their communities or beyond	Work harder in school. Pay more attention in class.
Actions: Cooperation/ Collaboration	Enhanced intention to cooperate and collaborate with others	
Actions: School	Enhance efforts in school.	

asking students to reflect on how they felt about given statements before the program, and after as a result of the experience. The mean scores for these two subscales represent the difference between pre and post scores.

**Emotional Support Behaviors:** To adapt the CLASS Model for the informal EE field trip setting, we used the literature and past research focused on educator behaviors in informal settings (e.g. Stern and Powell 2013) to develop indicators pertaining to the four sub-dimensions of *emotional support* (Table 2).

**Positive climate:** Positive climate includes relationships, affect, respect, and communication and is enhanced through the use of smiling and laughing (Pianta, La Paro, and Hamre 2008), openness and responsiveness (Bell and Daly 1984), and having positive expectations for students (Pianta, La Paro, and Hamre 2008). To capture positive climate building behaviors for short-term and informal settings, we adapted the CLASS model and measured *passion* (form of enthusiasm), *sincerity*, *personal sharing*, *affinity-seeking behaviors*, and *positive communication*.

*Passion:* Passion was measured as the educator's apparent level of enthusiasm and love for the lesson content (Beck and Cable 2002; Ham and Weiler 2002; Moscardo 1999; Stern and



Table 2. Emotional support behaviors.

Passion	The educator's apparent level of enthusiasm for the lesson content and the overall authentic emotional connection with which the material is delivered.	1 Educator seems completely detached/disinterested from the lesson.	2 Educator shows low levels of passion overall.	3 Educator shows moderate levels or sporadic instances of high passion.	4 Educator seems extremely passionate about the lesson.
Sincerity	Degree to which the educator seems genuinely invested in the messages he or she is communicating, as opposed to reciting information (demonstrating authentic interest).	1 Educator seemed to only be going through the motions, with no real sincerity or interest.	2 Educator seemed somewhat connected through the words they used, though their mannerisms or intonation didn't corroborate their words (not believable).	3 Educator seemed mostly sincere and genuine for most of the lesson.	4 Communication was clearly very sincere and genuine throughout the lesson, as evidenced by words, gestures, intonation, or other mannerisms.
Personal sharing	The degree to which the interpreter shared personal insights or experiences, answered questions about themselves for the audience, or provided their own opinion on topics or events relevant to the program.	1 Educator did not share any personal information with the audience.	2 Educator shared minimal personal information or viewpoints.	3 Educator shared a large amount of personal information and perspective.	4 Educator's personal life/ point of view is explicitly the central focus of the experience (used themselves as the primary framework for the program).
Affinity-seeking	These actions may include listening, nonverbal immediacy behaviors (smiling, frequent eye contact, forward leans, etc.), altruism and other similar behaviors.	1 Educator exhibits no affinity-seeking behaviors.	2 Educator exhibits minimal affinity-seeking toward students.	3 Educator exhibits moderate amounts of affinity-seeking toward students.	4 Educator exhibits frequent affinity-seeking toward students.
Positive Communication	The extent to which the educator encourages participation, provides positive feedback, or checks in on students.	1 Educator creates an environment where students feel shut down or afraid to express themselves.	2 Educator provides minimal positive communication.	3 Educator occasionally provides some elements of positive communication, such as encouraging participation, providing positive feedback, or checking in on students.	4 Educator consistently demonstrated positive communications throughout the entire program, explicitly creating a safe space for all forms of positive student engagement.
Disrespect	Educator shuts down students in a disrespectful way.	0 No disrespect.	1 Educator rarely demonstrates minor disrespect but has little impact on the students or the overall activity/program.	2 Educator frequently demonstrates disrespect and there is a major impact on the students that detracts from the overall activity/program.	
Inattentiveness	Educator is distracted or explicitly ignores the group at some point in a way that appears to impact the students or the program.	0 No inattentiveness issues.	1 Educator rarely demonstrates inattentiveness with a minor impact on students or the overall activity/program.	2 Educator frequently demonstrates inattentiveness and there is a major impact on the students that detracts from the overall activity/program.	
Inequity	Unequal treatment of different students in a way that might have actually influenced students negatively.	0 No inequity issues; all treated more or less the same.	1 Educator rarely demonstrates inequity issues with a minor impact on students or the overall activity/program.	2 Educator frequently demonstrates inequity issues and there is a major impact on the students that detracts from the overall activity/program.	
Impatience	Did the educator show any explicit impatience toward audience members?	0 No impatience issues.	1 Educator rarely demonstrates impatience.	2 Educator frequently demonstrates impatience.	
Responsiveness	The extent to which the educator responds to student requests, questions, or other cues.	1 Educator is unresponsive or averse to student cues, questions, or requests.	2 Educator is rarely responsive to student cues.	3 Educator is mostly responsive to student cues, but not all of the time.	4 Educator is consistently responsive to student cues.
Formality	The degree to which the educator was very formal, official, rigid, and controlling vs. casual, laid back, and accommodating during a program.	1 Educator was extremely casual and accommodating.	2 Educator was more casual than formal.	3 Educator was more formal than casual.	4 Educator was extremely formal.



Powell 2013) and not the theatrics associated with teaching as performing (Baughman 1979; DeLozier 1979). In the formal literature, this definition of enthusiasm refers to a style of instruction that is motivating and energizing to students (Kunter et al. 2011; Patrick et al. 2003; Turner et al. 1998). Educator passion has been found as a predictor of intrinsic motivation in students (Patrick, Hisley, and Kempler 2000) and higher engagement and learning (Keller, Neumann, and Fischer 2013). In informal interpretation programs, passion was also associated with higher levels of appreciation for the topic and the resources of the location (Powell and Stern 2013).

*Sincerity:* Sincerity was measured as the educator's degree of authenticity and genuine investment in the messages he or she was communicating, as opposed to uncaring and disingenuous (Ham 2009; Stern and Powell 2013). Lunenburg (2010) states that sincerity is the foundation on which all true communication rests. One study of sincerity in formal education, for example, found that less frequent more sincere praise was more impactful on students than continual, trivial praise from teachers (Brophy 1981).

*Personal sharing:* In this study, personal sharing was the degree to which the educator shared personal insights or experiences, answered questions about themselves, or provided their own insights on topics or events relevant to the program. Personal sharing was observed as an adaptation of the 'relationships' indicator in the positive climate dimension of the CLASS model. In the classroom, studies have found relevant personal sharing was positively correlated with classroom participation (Goldstein and Benassi 1994), greater student interest (Cayanus, Martin, and Weber 2003), and increased instructional clarity (Wambach and Brothen 1997).

*Affinity-seeking:* Affinity-seeking, a form of positive affect, is defined as 'the social-communicative process by which individuals attempt to get others to like and feel positive toward them' (Bell and Daly 1984) and was observed through behaviors such as smiling, frequent eye contact, forward leans, altruism and other similar behaviors (Pianta and Hamre 2009; Stern and Powell 2013; Ward and Wilkinson 2006). Affinity-seeking has been linked to teacher credibility in the classroom and learning (Frymier 1994; Frymier and Thompson 1992). Similar nonverbal immediacy behaviors, which are those that enhance closeness between people (Mehrabian and Friar 1969), have also been correlated with increased affection for the educator and course material and cognitive learning (Chesebro and McCroskey 2001; Frymier 1994; Richmond 1990).

*Positive communication:* Positive communication was defined as the extent to which the educator encourages participation and provides positive feedback. This variable is adapted from the 'positive communication' indicator of CLASS in which the educator offers verbal affection and positive expectations (Pianta and Hamre 2009).

**Negative climate:** Negative climate is measured by occurrences of negative affect, punitive control, sarcasm/disrespect, and severe negativity (Pianta and Hamre 2009). Classrooms high in positive climate are marked by the absence of negative climate behaviors. Classrooms with a negative climate are those in which teachers and students regularly disregard, disrespect, threaten, and do not consider one another (Reyes et al. 2012), leading to an atmosphere of mistrust and disrespect (Brackett et al. 2011). For our study, we measured behaviors of disrespect, inattentiveness, inequity, and impatience to capture negative climate.

*Disrespect:* Disrespectful behaviors performed by educators include using sarcasm, teasing, or humiliating students (Pianta and Hamre 2009). In a study on school violence, student respondents reported that the number one reason they misbehaved in schools was retribution to teachers that disrespected the individual, their families, or their culture (Hyman and Perone 1998).

*Inattentiveness:* Inattentiveness, the opposite of responsive behaviors (Stern and Powell 2013; Jacobson 1999; Knudson, Cable, and Beck 2003), occurs when an educator is distracted or explicitly ignores students during a program and is thought to negatively influence student's learning and feelings of social support (Merritt et al. 2012).

*Inequity:* Prior research defines inequity as the unequal treatment of different students/participants in an educational program (Ham and Weiler 2002; Stern and Powell 2013). Prior research

suggests that when teachers show unequal attention or treatment, students perceive the teachers as less consistent and more coercive (Skinner and Belmont 1993).

**Impatience:** *Impatience* is defined as any explicit irritability, anger, or a harsh voice shown toward students (Stern and Powell 2013; Pianta and Hamre 2009). Research suggests that students recognize teacher's impatience and frustration, which ultimately led to students feeling less interested in science (Khine and Fisher 2004).

**Sensitivity:** Sensitivity includes the indicator responsiveness (Pianta and Hamre 2009). In formal education, teachers that were acutely aware and responsive to students' needs led to increased academic success (Jennings and Greenberg 2009). On the CLASS evaluation scale, teachers demonstrating high sensitivity can adjust their teaching as necessary to better meet the needs of students as well as identify individual students in need of additional support (Pianta and Hamre 2009). Responsive teachers are thus able to address problems effectively and make students feel comfortable in seeking support and sharing their ideas freely (Pianta, La Paro, and Hamre 2008). In the informal setting, past research suggests that responsive educators/interpreters positively influenced audience outcomes in live interpretive programs (Stern and Powell 2013).

**Responsiveness:** Adapted from both the CLASS model and prior research in the informal setting, responsiveness is defined as the extent to which an educator responds to student requests, questions, or other cues to better meet student needs (Stern and Powell 2013; Jacobson 1999; Knudson, Cable, and Beck 2003; ).

**Regard for student perspective:** The final sub-dimension of emotional support in the CLASS model is regard for student perspective (Pianta and Hamre 2009). Teachers that exhibit high regard for student perspectives are flexible, support student autonomy and leadership, and freedom of movement (Merritt et al. 2012). More formal teachers are rigid and controlling, which negatively influences academic achievement in the classroom (Anderson and Walberg 1967).

**Formality:** For our study, formality was measured as the degree to which the educator was formal, official, rigid, and controlling vs. casual, relaxed, and accommodating during the program.

**Observational scoring:** We refined the scoring and anchors through extensive pilot testing to assure consistent, reliable, and valid scoring by all researchers. This pilot testing resulted in a reduced number of potential scores to enhance consistency and to capture the global measure related to the performance of these behaviors. Similar to Stronge et al. (2008) and Stern and Powell (2013), we used a 4-point scale for all positive climate variables in which 1 represented total absence; 2 represented minor presence; 3 represented moderate presence; and 4 represented that the characteristic was dominant throughout the program. For the negative climate variables, we reduced the scoring to a 3-point scale based on extensive pilot testing to ensure consistency and reliability between researchers. Negative climate variables were scored on a 0–2 scale in which 0 = total absence or perceived influence; 1 = minor occurrence/influence; and 2 = major incident or strong influence.

### **Data cleaning procedures**

Five thousand three hundred and seventeen completed post-program surveys and 345 program observation sheets were entered into Microsoft Excel. Data were then transferred to SPSS for screening and analysis. First, we removed three programs (26 surveys) because response rates were below 50% of attendees. We then screened surveys and removed 210 surveys that were missing more than 25% of the items. With these removals, we removed one additional program (8 additional surveys) because the response rate dropped below 50%. We also screened data for surveys with no variability in answers, irregular patterns including strings of consecutive numbers, or using one circle to indicate responses for multiple items. This screening identified an

additional 94 surveys with these problems, which we removed. This caused one additional program to have a response rate below 50%, which was also removed from the database (along with an additional 7 surveys). We then screened the data for multivariate outliers using Mahalanobis Distance (MAH), which identified another 563 cases for removal. We removed an additional 6 programs because the response rate dropped below 50% (dropping an additional 33 surveys). Our final sample included 334 programs (4,376 individual surveys) from 90 program providers.

### **Structural equation modeling**

As part of our analyses, we used confirmatory factor analysis (CFA), a form of Structural Equation Modeling (SEM), to confirm the structure and measurement of EE21 and structural regression modeling to examine the influence of educator's emotional support behaviors on EE21. In this paper we report the Satorra-Bentler Scaled Chi-Square (S-B  $\chi^2$ ), Robust Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR), the Robust Root Mean Square Error of Approximation (RMSEA) and its associated 90% confidence interval to evaluate the 'fit' of a specified model (Bentler and Yuan 1999; Byrne 2006). We also report the Beta weights, which in structural regression models reflect the effect size of an independent variable on the dependent variable.  $R^2$  explains the proportion of the total observed variance in the dependent variable explained by the model.  $R^2$  values, which pertain to predictive validity, should be assessed independently of fit indices (Kline 2005).

## **Results**

### **Program descriptions**

The 334 programs served diverse audiences across the country: 46% of programs served majority White students; 32% serviced majority LatinX students; 8% were for majority Black students; and 14% of programs served a multi-racial group of students with no clear racial majority. Thirty-nine percent of programs serviced fifth grade participants; 29% of programs supported sixth grade students; 18% were for seventh grade; 5% of programs were for eighth grade. The remaining 8% of programs were comprised of mixed grades. The average program duration was 190.8 min (SD = 77.2 min) and the mean observed group size was 15.8 (SD = 7.3).

### **Descriptive statistics: independent variables**

Emotional support behaviors used by educators were measured on a 4 or 3 point scale and represent the degree to which they were utilized in the program during a full program (Table 3). The majority of educators scored a 3 or above on a 4 point scale in their use of *passion* (79.4%), *sincerity* (86.2%), *affinity-seeking* (58.4%), and *positive communication* (77.9%). *Personal sharing* was scored 1–4, and the data suggests that this behavior did not occur as frequently as the other positive climate variables. A score of 4 was not observed and a score of 3 was observed in only 7.5% of programs, in which educators shared a fair amount of personal insights or experiences, answered questions about themselves for the audience, or provided their own insights on topics or events relevant to the program.

Negative climate variables were scored on a 0–2 scale. Across programs, educators less frequently showed *disrespect* (10.8%), *inattention* (28.1%), *inequity* (21.6%), and *impatience* (23.4%).

82.0% of educators scoring a 3 or above on a 1–4 scale for *Responsiveness*. Lastly, *formality* was also scored on a 1–4 scale, 33.8% of educators scored a 2 and 59.9% of educators scored a 3 indicating a relatively structured approach.

**Table 3.** Descriptive statistics for independent variables.

Dimension	Variable	N	Min.	Max.	Mean	Std. Dev.
<b>Positive climate</b>	Passion	334	1	4	2.96	.628
	Sincerity	334	1	4	3.25	.690
	Pers. sharing	334	1	3	1.68	.608
	Affinity-seeking	334	1	4	2.67	.723
<b>Negative climate</b>	Pos. comm.	334	1	4	2.91	.668
	Disrespect	334	0	2	0.13	.382
	Inattention	334	0	2	0.31	.518
	Inequity	334	0	2	0.24	.488
	Impatience	334	0	2	0.28	.547
<b>Sensitivity</b>	Responsiveness	334	1	4	3.06	.710
<b>Stu. perspective</b>	Formality	334	1	4	2.70	.581

### **Descriptive statistics: outcomes (EE21)**

Table 4 displays the means, standard deviations, and factor loadings for each item that composed the EE21 scale, as well as the grand mean and standard deviation for the composite score of the full scale. All variables were scored on a scale of 0–10. Two subscales, Self-Efficacy and Environmental Attitudes, were measured using retrospective pre/post questions that asked students to reflect on how they felt about given statements before the program and then after as a result of the experience and the results are reported as the mean change in scores (retrospective post score-retrospective pre score). Although all items were measured on 0–10 rating scales (including the retrospective pre-post change scores), we developed a composite EE21 score using standardized z-scores to account for the potential of unequal weighting of each subscale. This composite EE21 z-score was almost perfectly correlated with the equally weighted EE21 score ( $r = .973$ ) and did not meaningfully change subsequent results. For simplicity sake, we use the non-transformed data in the analyses reported herein.

We also conducted Confirmatory Factor Analysis to confirm the structure and measurement of EE21. Fit indices for the outcome EE21 ( $S-B\chi^2 = 2732.0996$ , 496DF, CFI = 0.973, SRMR = 0.027, RMSEA = 0.036 (.034, .037)) indicated that the EE21 scale was an excellent fit of the data and cross-validated the structure and measurement from previous research (see Powell et al. 2019). We also tested EE21 with a single second order factor to assess the suitability of developing a single composite score. Similar to prior research (see Powell et al. 2019), the results indicated the single second order factor model fit was acceptable ( $S-B\chi^2 = 5529.06$ , 454DF, CFI = 0.940, SRMR = 0.056, RMSEA = 0.051 (.049, .052)).

### **Correlations**

To examine the relation between each emotional support behavior and EE21 we conducted Pearson bivariate correlations (Table 5). *Sincerity* ( $r = .205$ ), *affinity-seeking* ( $r = .227$ ), *positive communication* ( $r = .288$ ), and *responsiveness* ( $r = .277$ ) were significantly correlated with EE21. *Inattention* ( $r = -.199$ ) and *inequity* ( $r = -.175$ ) were also statistically negatively correlated with EE21. Also noteworthy, *sincerity* and *passion* were highly correlated ( $r = .620$ ). *Passion* was also statistically correlated with *affinity-seeking* ( $r = .492$ ), *positive communication* ( $r = .485$ ), and *responsiveness* ( $r = .309$ ). *Sincerity* was also correlated with *affinity-seeking* ( $r = .576$ ), *positive communication* ( $r = .562$ ), and *responsiveness* ( $r = .355$ ). *Affinity-seeking* was also correlated with *positive communication* ( $r = .637$ ) and correlated with *responsiveness* ( $r = .380$ ).

### **Modeling influence**

We used structural equation modeling to examine the relative influence of the educators' use of emotional support behaviors upon student outcomes at EE programs across the country. A

**Table 4.** EE21 means, standard deviations, and CFA factor loadings of items.

Constructs and items (n = 4376)	M	SD	CFA factor loadings
<b>Connection/Place attachment</b>			
Knowing this place exists makes me feel good.	7.38	3.07	.799
I want to visit this place again.	7.41	2.88	.896
I care about this place.	7.81	2.77	.863
<b>Learning</b>			
How different parts of the environment interact with each other.	6.93	2.43	.766
How people can change the environment.	7.33	2.68	.813
How changes in the environment can impact my life.	7.41	2.67	.830
How my actions affect the environment.	7.73	2.65	.799
<b>Interest in learning</b>			
Science.	6.33	3.20	.788
How to research things I am curious about.	6.36	3.07	.878
Learning about new subjects in school.	6.04	3.24	.844
<b>21<sup>st</sup> century skills</b>			
Solving problems.	5.56	3.18	.857
Using science to answer a question.	6.15	3.07	.852
Listening to other people's points of view.	6.56	3.10	.851
Knowing how to do research	6.26	3.29	.834
<b>Meaning/Self identity</b>			
Taught me something <u>that will be useful to me</u> in my future.	6.63	3.07	.827
Really made me think.	6.67	3.12	.868
Made me realize something I never imagined before.	6.38	3.24	.840
Made me think differently about the choices I make in my life.	6.53	3.27	.817
Made me curious about something.	6.63	3.07	.840
<b>Self-efficacy (Retrospective pre-post)</b>			
I believe in myself.	0.83	1.75	.578
I feel confident I can achieve my goals	0.78	1.59	.704
I can make a difference in my community.	1.12	1.77	.710
<b>Environmental attitudes (Retrospective pre-post)</b>			
I feel it is important to take good care of the environment.	0.78	1.47	.577
Humans are a part of nature, not separate from it.	0.97	1.73	.622
I have the power to protect the environment.	1.17	1.85	.723
<b>Actions: Environmental stewardship</b>			
Help to protect the environment.	7.34	2.81	.866
Spend more time outside.	7.12	3.03	.778
Make a positive difference in my community.	7.06	2.83	.920
<b>Actions: Cooperation/Collaboration</b>			
Listen more to other people's points of view.	6.80	2.99	.883
Cooperate more with my classmates.	6.79	3.08	.860
<b>Actions: School</b>			
Work harder in school.	7.08	3.26	.949
Pay more attention in class.	7.04	3.33	.913
<b>EE21 composite (Chronbach's alpha = .964)</b>	<b>5.01</b>	<b>1.77</b>	

**Table 5** Pearson correlations between independent variables and EE 21.

	1	2	3	4	5	6	7	8	9	10	11	12
1. EE 21	–											
2. Passion	.105	–										
3. Sincerity	.205**	.620**	–									
4. Personal sharing	-.006	.122*	.085	–								
5. Affinity-seeking	.227**	.492**	.576**	.103**	–							
6. Pos. comm.	.228**	.485**	.562**	.145**	.637**	–						
7. Disrespect	-.045	-.128**	-.142**	.020	-.120*	-.169**	–					
8. Inattention	-.199**	-.228**	-.316**	.165**	-.247**	-.278**	.031	–				
9. Inequity	-.175**	-.270**	-.296**	.154**	-.188**	-.313**	.126*	.476**	–			
10. Impatience	-.051	-.237**	-.306**	-.105	-.256**	-.254**	.433**	-.010	.115*	–		
11. Responsiveness	.277**	.309**	.355**	-.022	.380**	.500*	-.107	-.427**	-.434**	-.170**	–	
12. Formality	-.123*	-.109*	-.127*	-.014	-.190**	-.192**	.104	-.028	.122*	.259**	-.252**	–

\*\*Correlation is significant at .01 level (2-tailed)

\*Correlation is significant at the .05 level (2-tailed)

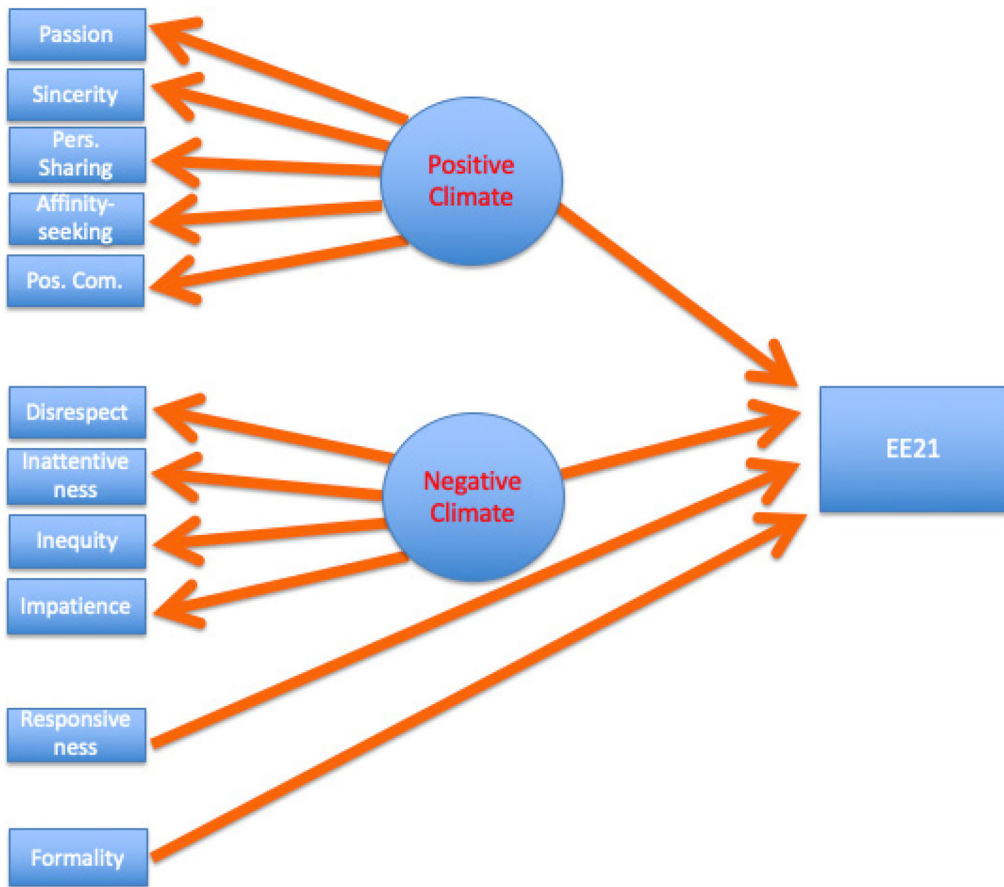


Figure 2. Hypothesized model based on the CLASS model of Emotional Support.

model was created based on the adapted CLASS model of Emotional Support and the list of variables in Table 2 (Figure 2). The initial fit of this model was deemed unacceptable ( $S-B\chi^2 = 395.85$ ,  $53 = DF$ ,  $CFI = 0.591$ ,  $SRMR = 0.184$ ,  $RMSEA = 0.139$  (.126, .152) (Byrne 2006). Through an iterative process, we adjusted the model using diagnostics, such as insignificant predictors, low loadings, and issues of covariance, which indicated potential model changes that would improve fit and parsimony (Byrne 2006). This generally involved removing variables one at a time based on theory and statistical indicators produced at each stage of the modeling process. The factor *Negative Climate* and the variable *formality* were not significant predictors of EE21 and were removed; the variable *personal sharing* was removed because of low factor loading; and *passion* was removed because of error covariance issues with *sincerity*. The resulting model is displayed in Figure 3.

Fit indices for the final model ( $S-B\chi^2 = 7.65$ ,  $4 = DF$ ,  $CFI = 0.991$ ,  $SRMR = 0.021$ ,  $RMSEA = 0.052$  (.000, .108) indicated that the model was an acceptable representation of the relationships present in the data. The variables *sincerity* ( $\beta = .700$ ,  $p < .05$ ), *affinity-seeking* ( $\beta = .776$ ,  $p < .05$ ), and *positive communication* ( $\beta = .827$ ,  $p < .05$ ) were reflected in the Factor *positive climate*, which influenced EE21 ( $\beta = .190$ ,  $p < .05$ ). *Responsiveness* also influenced *positive climate* ( $\beta = .547$ ,  $p < .05$ ), and was also a direct predictor of the outcome EE21 ( $\beta = .173$ ,  $p < .05$ ). Theoretically *responsiveness* is not only an indicator of the *sensitivity* dimension of CLASS, but practically and theoretically it is also an aspect of establishing a *positive climate*. The factor *positive climate* ( $\beta = .190$ ,  $p < .05$ ), together with *responsiveness*, accounted for 10% of the variance in EE21.<sup>1</sup>

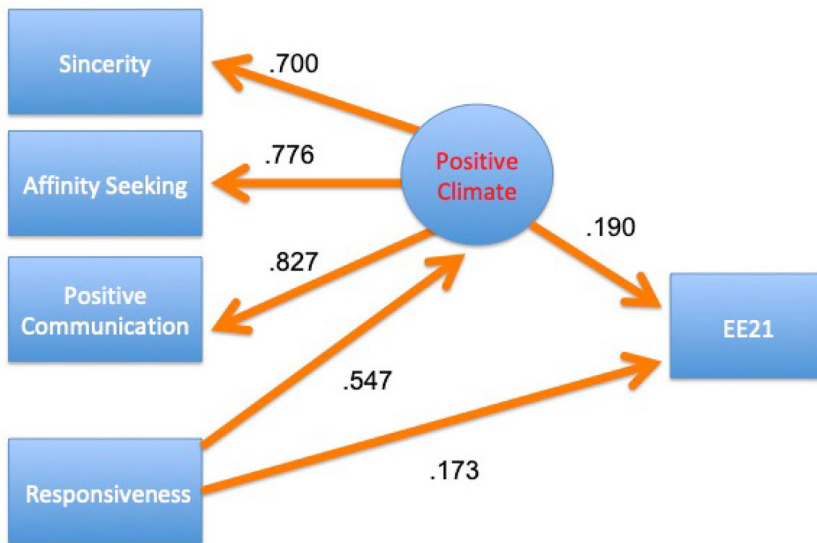


Figure 3. Final model of the influence of emotional support behaviors on EE21.

### Qualitative examples of significant results

Each individual researcher also recorded qualitative notes at the conclusion of each program about the instructors' practices, including: what the instructor did to create a positive or negative learning environment, examples of how they interacted with the students, examples of emotional support behaviors, negative climate creators, and any other examples of specific dialogue, anecdotes, or actions that were relevant and/or important to creating emotional support. Examples of each behavior that was significantly correlated with EE21 are provided in Table 6.

### Discussion

This study sought to determine the influence of educator's use of emotional support behaviors on positive learning outcomes for middle-school aged children (grades 5–8; ages 9–12) attending environmental education field trip programs across the United States. To accomplish this goal we observed 334 EE field trip programs for youth (grades 5–8; ages 9–12) provided by 90 different organizations across the U.S., systematically monitored and quantified the use of emotional support behaviors and administered retrospective surveys with program participants immediately following the program to assess positive learning outcomes as measured by EE21. Results, which largely mirrored previous work in informal (e.g. Powell and Stern 2013; Stern and Powell 2013) and formal education (e.g. NICHD ECCRN 2002; Pianta and Hamre 2009; Hamre and Pianta 2005) suggest that educator's use of positive climate behaviors occurred at a much higher frequency than the negative climate behaviors, although negative climate behaviors did occur. In order to examine the relationship between emotional support behaviors and EE21, we examined the bivariate relations. *Sincerity*, *affinity-seeking*, *positive communication*, and *responsiveness* all positively correlated with EE21 ( $p < .01$ ). *Inattention* and *inequity* were negatively correlated with EE21 ( $p < .01$ ). Additionally, the strong correlations between each of the positive emotional support behaviors suggest that when educators demonstrate one of these behaviors, they often demonstrate the others. Similarly, negative emotional support behaviors were also significantly correlated with each other.

To better understand the relationship between emotional support behaviors and positive student outcomes, we used structural equation modeling. The resulting model revealed several

**Table 6.** Significantly correlated educator emotional support behaviors.

Characteristic	Examples
<p><b>Sincerity</b> Degree to which the educator seems genuinely invested in the messages he or she is communicating, as opposed to reciting information (demonstrating authentic interest).</p>	<p>HIGH: The educator clearly loved the environment, the bay, and participating in education. She conveyed her heartfelt love for the location and talked softly and would say, 'I invite you students to notice your surroundings' while having them stop and just look. She also sat on the ground with the students, learned each of their names, and frequently smiled at them during teaching.</p> <p>LOW: The educator gave two students high fives for answering questions, but mechanically with no genuine interest or smile. He did not convey any desire to be there with the students, nor any connection with the material being taught and was just trying to get through it as quickly as possible.</p>
<p><b>Affinity-seeking</b> These actions may include listening, nonverbal immediacy behaviors (smiling, frequent eye contact, forward leans, etc.), altruism and other similar behaviors.</p>	<p>HIGH: The educator during all group discussions and activities constantly smiled, made eye contact, and engaged with the students by continually asking them questions and repeating their answers with enthusiasm and confirmation. He had all the students 'play air guitar' to indicate that they could hear him, and another time he had them say 'boo yeah!' Before the children disembarked, each was requested to tell him their favorite thing that they learned that day.</p> <p>HIGH: He was continually smiling and nodding at the students, doing the slime handshake (from an inside joke he had introduced to the group in the beginning of the program relating to a banana slug), and offering high fives to the students.</p> <p>LOW: The educator appeared uncaring, she never smiled at the students, never changed the inflections in her voice, and never engaged the students other than just leading them through the activities.</p>
<p><b>Positive communication</b> The extent to which the educator encourages participation, provides positive feedback, or checks in on students.</p>	<p>HIGH: Throughout the program, the educator was constantly affirming all of the students' answers and making sure all students were participating. At one point when she was asking questions to the group, the educator looked at one boy who had not said anything and said, 'I know you guys are probably thinking the same answers so don't be afraid to speak up'. She made every child touch the fish during the dissection and made them all cut part of its skin. The educator also told the group that they were amazing and thanked them for being so well behaved. She also said that because they were that way, she would give them the special privilege of viewing the shark exhibit and that she didn't let everyone do it, so it was special.</p> <p>LOW: A student pointed out a bird, giving it the wrong name, and the educator responded saying, 'NO. I just said it was a hummingbird!'. At one point, the educator stated that she 'didn't care' whether or not the students understood or could see what she was talking about. Additionally, when exploring the environment for plants, one student picked up a piece of glass and asked the educator what he should do with it. The educator responded, 'Seriously?? You were supposed to be doing your worksheet!!'</p>
<p><b>Inattentiveness</b> Educator is distracted or explicitly ignores the group at some point in a way that appears to impact the students or the program.</p>	<p>HIGH: The educator left the students and teacher chaperones unattended for 15 minutes not knowing where to go or what to do while he walked into a building and disappeared.</p> <p>HIGH: The educator left the students multiple times to talk on the phone, sometimes with the second educator teaching and sometimes just having them entertain themselves.</p>

*(continued)*



Table 6. Continued.

Characteristic	Examples
<b>Inequity</b> Unequal treatment of different students in a way that might have actually influenced students negatively.	HIGH: The educator divided the students into two groups, the first cleaned out a pig pen in order to get a sense of farm chores. The educator sent the other half of the students to go teach themselves about the chickens in a separate area. The educator never went to check on the group observing the chickens and the groups did not switch stations, so the students did not get the same experiences as their peers.
<b>Responsiveness</b> The extent to which the educator responds to student requests, questions, or other cues.	HIGH: Every time a student had a question, the educator would respond to them. Even when students gave incorrect answers, she would acknowledge what he or she said in a way that gently guided them to the correct answer. For example, at one point, a student raised his hand to answer a question but then said that he forgot what he was going to say, and the educator then mouthed the answer to him and said, 'Exactly! That's what you were going to say right?' with a smile. At the very beginning of her lesson, two boys were looking off at another exhibit, and she immediately noticed and redirected them by saying that they will go look at that next and that is exactly what she did. LOW: The educator completely disregarded the student's cues and requests. The students' morale started off high but waned as he lectured. At the beach while he was talking to them, some students were playing in the sand not listening to him, one student put in headphones, and another girl was Facetiming someone from another group. Meanwhile, the educator continued to teach throughout, ignoring all of the students who were not paying attention.
<b>Formality</b> The degree to which the educator was very formal and official vs. casual and laid back about the presentation.	HIGH: The educator was very structured and was a strict disciplinarian, almost like a drill sergeant with the students. For instance, when he had the students go touch the ocean they became excited and started to run. He told them to stop and that they all had to walk parallel to him or they were not going to be able to touch the ocean (this was presented as a threat).

lessons. First, the final model supports the CLASS model's positive climate sub-dimension. The model indicates that *sincerity*, *affinity-seeking*, and *positive communications*, all components of positive climate often occurred together during a program, which directly influenced student outcomes. *Responsiveness* also related to positive climate, and was also a direct predictor of the EE21 outcome. The negative climate variables were dropped in the final model and occurred at much lower frequency and were negatively correlated with the positive emotional support behaviors. This finding supports the notion that these negative behaviors can be considered the 'flip side of the coin' to many of the positive climate variables (Pianta and Hamre 2009). The positive emotional support behaviors had a positive relationship with student outcomes, while the negative climate variables had the opposite. And, when the positive behaviors were present, the negative ones were not.

Certain limitations in the methods, data, and analyses are important to consider when interpreting these findings. First, our observations of emotional support behaviors reflect a global description of educator/student interactions during the field trip rather than educator self-reports or time-sampling measures. Past studies suggest that each of these different approaches to measurement each have different strengths and limitations (Pianta and Hamre 2009; Hamre and Pianta 2005). Similar to conclusions drawn by prior researchers (Stern and Powell 2013; Pianta and Hamre 2009; Gage and Needels 1989), we believe global descriptions provide a more accurate picture of interactions over the course of an entire field trip. Second, observations by

researchers may not fully reflect the perceptions and experience of the participating students. Third, observations may have been influenced by the Hawthorne effect and may have biased the educators' behaviors in a positive direction, although we regularly observed negative climate behaviors. Fourth, structural equation modeling explicitly aims to produce the most parsimonious predictive model. As such, certain independent variables were eliminated from the modeling process to address covariance issues. While not all the measured variables are included in the model, they should still be considered in future research. The variables may have been eliminated due to lack of observed variance, covariance with other variables, or other issues. Finally, the final SEM model accounted for 10% of the variance in EE21. Similar to studies in both informal (e.g. Powell and Stern 2013) and formal education (e.g. Howes et al. 2008; Rutter and Maughan 2002; Morrison and Connor 2002; Hamre and Pianta 2005), the results suggest that emotional support behaviors do not replace effective programming, but they are a part of a successful EE program.

## Conclusion

Despite the limitations, the results of this study have several practical implications. First, emotional support behaviors are often ignored in training and in guidelines despite their importance in influencing student outcomes (Carter 2016). Based on the findings of this study, we suggest that trainings for educators could and should include explicit discussions and opportunities to practice positive emotional support behaviors such as *sincerity*, *affinity-seeking*, *positive communications*, and *responsiveness*, as these behaviors were found to be the most significant predictors of EE21. For example, training programs could focus on making educators cognizant of their use of *affinity-seeking* behaviors, such as smiling, eye contact, and head nodding. Educators could also be made aware of their *responsiveness*, by being trained on how to acknowledge different student cues, whether that be raised hands for questions or obvious signs of discomfort during a program. Additional examples of emotional support training can be found in the formal education and youth programming literature where the influence of emotional support behaviors on student outcomes is already demonstrated (e.g. Hamre and Pianta 2005; Yohalem and Wilson-Ahlstrom 2010). Additionally, it should not be assumed that all educators demonstrate positive emotional support behaviors, as evidenced by our observations of negative climate behaviors. Thus, training should also include an emphasis on identifying and avoiding negative behaviors when interacting with the students. Finally based on the results of this study, positive emotional support behaviors should be thought of as an essential complement to effective programmatic design and implementation.

## Note

1. We also controlled for the influence of primary race of group and grade level by group mean centering the data and the results/significant pathways did not change.

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