Empathy Literature Review

Empathy and Its Dimensions

Empathy is the understanding and sharing of others' feelings (Knafo-Noam, Zahn-Waxler, Davidov, Hulle, Robinson, & Rhee, 2009). It is also described as an affective response that stems from the comprehension of another's emotional state or condition (Eisenberg & Fabes, 1998). Empathy is at the heart of what it means to be human, and is significant across many contexts. Harvard's Graduate School of Education describes empathy as a foundation for acting ethically and humanely, for preventing bullying and cruelty, for good relationships of many kinds, for loving well, and for academic and professional success (MCC, 2018). It is surfacing as being significant in conservation contexts as well. Within the zoo and aquarium community, empathy is defined as a stimulated emotional state that relies on the ability to perceive, understand, and care about the experiences or perspectives of another person or animal (Wharton, Khalil, Fyfe & Young, 2019). Empathy includes both affective and cognitive components (see Figure 1).

- Affective empathy is an instinctive ability to sense, feel, or experience the perceived emotions of another person (Cuff, Brown, Taylor, & Howat, 2014). It is linked to mirror neurons in the insula region of the brain (Carr, Iacoboni, Dubeau, Mazziotta, & Lenzi, 2003), which allow an individual to observe another person and respond to the stimuli in a similar way (Goldman, 2014). Most people and many animals have this capacity, although some biological conditions affect how well mirror neurons function and grow (Gerdes, Segal, Jackson, & Mullins, 2013). On their own mirror neurons are not responsible for empathic feelings, but instead provide a neural basis for connecting our own and others' experiences. Affective empathy includes *emotional sharing* and *empathic concern.*

  - *Emotional sharing* (sometimes called emotional or affective empathy) is sensing or experiencing the perceived emotions of another. Some researchers use a more specific term, emotional contagion, to further differentiate emotional sharing that happens through observing another person from emotional sharing with people who are not present, animals, or even fictitious characters (Bloom, 2016).

  - *Empathic concern* (sometimes called motivational empathy or compassionate concern) is the motivation to care for individuals who are vulnerable or distressed. Emotional sharing may lead to empathic concern with further cognitive processing of the other person's state (Eisenberg, 2000). The extent to which emotional sharing translates into concern and caring behaviors is also thought to be dependent on the child's depends on his/her emotion regulation skills (Hay, 2009). It may be helpful to note that Bloom (2016) suggests that positive feelings toward others, such as a desire that others do well and do not suffer or similar feelings of kindness, compassion, and concern, can be a moral motivation to act, without necessarily experiencing similar feelings of the other. Also of note is sympathy is somewhat similar to Bloom's (2016) conception of empathic concern, in that feelings of concern exist without necessarily sharing the same feelings; for example, one may be concerned about another person who is experiencing anxiety, without feeling anxious oneself. However sympathy, unlike empathic concern, doesn't necessarily have the motivational component to act on that concern.

- Cognitive empathy is the ability to understand what another is feeling or thinking, without necessarily feeling those feelings or thinking those thoughts yourself (Spreng, McKinnon, Mar, & Levine, 2009). In other words, it

is the ability to understand the experiences of others by recognizing and imagining their reality (Cuff et al., 2014). It includes *feelings identification and perspective taking.*

- ○ *Feelings identification* is the ability to perceive cues from another and understand what that person is feeling and thinking.
- ○ P*erspective taking* is the ability to consciously place oneself in the mind of another and imagine what that person is thinking or feeling ("putting yourself in another's shoes").

Cognitive empathy is also is based in mirror neurons, but unlike affective empathy, it is intentional and controllable; it is also considered to be teachable (Carr, et al., 2003). A person learns cognitive empathy as they develop their ability to understand and predict their own feelings and actions, as well as those of others, and communicate the similarities and differences between those experiences (Myers, 2007). Also, the more one knows about the experience and perspective of another, the more accurate their cognitive empathy will be (Young, Khalil, & Wharton, 2018).
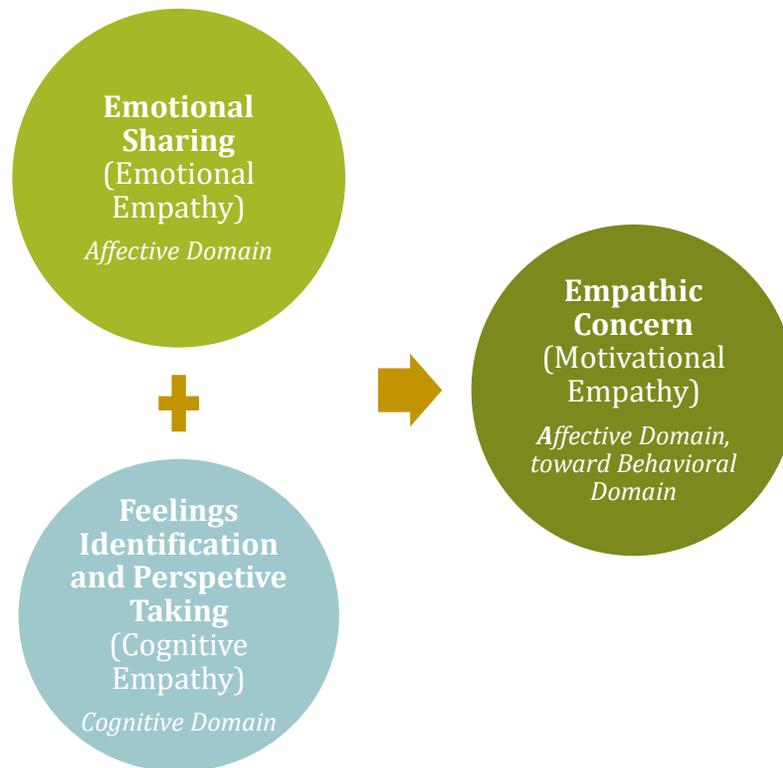

Figure 1: Relationship among Affective and Cognitive Dimensions of Empathy

It is also useful to note the distinction between *positive empathy* (empathic joy) and *negative empathy* (empathic sorrow). Positive empathy includes empathic sharing of feelings such as joy, playfulness, or positive social relationships. Negative empathy is often in the context of feelings of distress. Additionally, the literature regarding empathy also distinguishes *induced empathy* from *dispositional empathy*. Induced empathy relates to situations where something induces, arouses, or triggers empathic concern (seeing a suffering person or animal, for example), which is in contrast to a dispositional tendency to understand and share the emotional experience of another (Tam, 2013).

Empathy and Social and Emotional Learning

Social and emotional learning (SEL) serves as an umbrella term to represent an array of non-academic skills that individuals need in order to set goals, manage behavior, build relationships, and process and remember information (Jones, 2020). These intrapersonal and interpersonal competencies develop across one's life. They can be supported through teaching and other supportive interventions, and they can also be measured and assessed. Social and emotional skills are highly interrelated with children's development in other domains, and much of learning in the other domains is based on the foundation of children's healthy social and emotional development (MN Department of Education [MDE], 2017). Young children's social and emotional skills guide their behavior, affect their overall mental health, and impact their ability to succeed academically as they move on to later schooling. These skills and competencies are essential to success at home and in school, work, and community. Research shows that students with these skills do better in school and in life, including more positive attitudes about school, prosocial behavior, and academic achievement, as well as reductions in aggression, mental health problems, and substance use (National Research Council, 2012).

SEL competencies and skills can be organized into three interrelated skill areas: cognitive, social, and emotional. It is important to note, however, that these skills and competencies develop and are in dynamic interaction with attitudes, beliefs, mindsets, character, and values, all of which are essentially tied to characteristics of settings (Jones, 2020). There are many different frameworks for conceptualizing and categorizing the domains within social and emotional learning. Harvard's Graduate School of Education has an ongoing *Taxonomy Project* designed to create a scientifically-grounded system for organizing, describing, and connecting frameworks and skills across the non-academic domain. As part of their *Taxonomy Project*, they created *Explore SEL* to serve as a navigator for the field of social and emotional learning, by summarizing and connect the major SEL frameworks and skills. *Explore SEL* uses the following six domains: cognitive, social, emotion, values, perspectives, and identity. Empathy is classified within the emotion domain (see Figure 2, based on information from *Explore SEL*, Jones 2020).

Cognitive	For concentrating and focusing, remembering instructions, prioritizeing tasks, controling impulses, setting and achieving goals, and using information to make decisions
	Skills: Attention Control, Working Memory & Planning, Inhibitory Control, Cognitive Flexibility, and Critical Thinking.
	Outcome: Attaining goals
Emotion	For recognizing, expressing, and controlling one's emotions and understanding and empathizing with others
	Skills: Emotion Knowledge & Expression, Emotion & Behavior Regulation, and **Empathy & Perspective-taking**
	Outcome: Managing one's feelings % behavior, interacting with/responding to others in prosocial ways
Social	For accurately interpreting other people's behavior, effectively navigating social situations, and interacting positively with others
	Skills: Understanding Social Cues, Conflict Resolution & Social Problem-solving, and Prosocial & Cooperative Behavior
	Outcome: Coexisting peacefully and collaboratively
Values	For supporting prosocial and productive membership of a community
	Values, traits/virtues, and habits: Ethical Values, Performance Values, Intellectual Values, and Civic Values
	Outcome: Living and working together in a productive and prosocial way
Perspectives	For shaping how one views and approaches the world
	Perspectives: Optimism, Gratitude, Openness, and Enthusiasm/Zest
	Outcome: Managing feelings to successfully accomplish tasks and get along with others
Identity	For understanding and perceiving oneself and one's abilities
	Competencies: Self-knowledge, Purpose, Self-efficacy & Growth Mindset, and Self-esteem
	Outcome: Positive coping with challenges and positive relationships

Figure 2. Categorization of Social and Emotional Learning Domains

In Minnesota, SEL is one of the domains within the Early Childhood Indicators of Progress (ECIPs). In addition to SEL, the other domains are Approaches to Learning; Language, Literacy and Communications; Arts; Social Systems; Physical and Movement Development; Mathematics; and, Scientific Thinking. ECIIPs are research-identified areas of learning in the birth to age 5 years, representing a shared continuum of expectations for what children can know and do prior to kindergarten. The ECIPs are grounded in the recognition that young children do not necessarily acquire knowledge and skills in a linear way. Young children's developing brains require time to create strong connections and consolidate knowledge and skills, with skills sometimes appearing and disappearing, only to reappear later, fully integrated into a

child's capacity (MDE, 2017). Thus, the indicators of learning within the ECIPs describe patterns of growth and areas needing support for the child. They guide teachers and caregivers in selecting curriculum, instructional approaches, and assessments, toward supporting all children's learning through high-quality play and teacher-directed learning (MDE, 2017).

The SEL Domain includes three components: Self and Emotional Awareness; Self-Management; and Social Understanding and Relationships. The subcomponents and indicators for each of these three SEL components, listed in Appendix A, address the specific expectations across the developmental spectrum (MDE, 2017). For infants, these sub-components and indicators focus on the way they indicate their needs to caregivers, respond to stimuli, learn to self-comfort, attend to the emotions of others, and show likes and dislikes. For toddlers, the focus is on how they are beginning to attempt new challenges, use words to express needs and emotions, to follow simple routines, and to engage in parallel play with other children. The focus for preschoolers is on how they show confidence and self-direction, how they identify as part of a family and community, their ability to make choices, their verbal expression of needs and emotions, their responses to changing behavioral expectations, and how they are beginning to manage conflicts in social interactions. Within the SEL Domain of the ECIP (MDE, 2017), empathy appears to be embedded within the emotions and social responsiveness subcomponents (See Appendix A).

Empathy and Prosocial Behavior

Empathy is often assumed to involve being responsive to the feelings of another, not just understanding their feelings. This is based on an underlying assumption that there is a direct relationship between emotional attunement and interpersonal responsiveness, such as behaving compassionately in response to another person's distress. Prosocial behavior is often taken as an indicator of empathy, yet evidence from the field of psychopathy suggests that cognitive empathy can exist in the absence of affective or behavioral empathy (Blair, 2006).

Prosocial behavior is behavior that is intended to benefit or assist others. Prosocial behavior is a desirable outcome, as it is associated with healthy emotional and social functioning including positive peer relations (Eisenberg & Fabes, 1998). Prosocial behavior is also associated with high self-esteem (Bosacki, 2003) and academic performance (Welsh, Parke, Wideman, & O'Neil, 2001). A meta-analysis of over 200 SEL programs found programs with greatest impact on prosocial behavior, behavior problems, and academic performance were those that fostered empathy, emotion recognition, stress management, problem solving, and decision-making (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Thus, empathy-related constructs appear to be a crucial element of successful SEL interventions.

Empathy is thought to play an important role in the development of prosocial behavior and successful social interaction, as it allows children to predict others' actions, emotions and intentions (Bernhardt and Singer, 2012). Research suggests a modest positive relationship between empathy and prosocial behavior (Eisenberg & Miller, 1987). Children high in empathy show more prosocial tendencies such as comforting, altruistic, and responsive behaviors toward peers (Miller & Jansen op de Haar, 1997). Similarly, vicarious emotional responding and moral reasoning had a positive relationship with prosocial behavior toward peers, with prosocial behavior (in the form of helping a peer in distress) most likely to occur when children had both high moral reasoning and well-developed perspective-taking abilities (Miller, Eisenberg, Fabes, & Shell, 1996). Thus, while affective empathy is important in motivating morally relevant and prosocial behavior, cognitive empathy (the ability to identify feelings and take another person's perspective) is also needed (Malti, Gummerum, Keller, & Buchmann, 2009). The affective emotional sharing, alongside the cognitive perspective taking, supports the empathic or motivational concern that appears to be closely connected with one's propensity to relieve another's suffering through action (Pittinsky & Montoya, 2016). Likewise, the analysis

by Malti et al. (2016) similarly suggests the various components of empathy-related responding may work in concert to influence prosocial behavior and academic performance. As mentioned earlier, emotion regulation skills also may mediate the relationship between empathy and caring behaviors (Hay, 2009). Further, research also suggests empathy may partially mediate the relationship between early prosocial behavior and later prosocial dispositions, suggesting empathy may be part of a larger prosocial personality trait that develops in children and motivates helping behaviors into adolescence and young adulthood (Eisenberg, Guthrie, Murphy, Shepard, & Garlo, 1999).

Empathy and Child Development

Empathy is thought to be a relatively enduring disposition, which is fairly stable across time and consistent across contexts and also across its cognitive and affective aspects (Knafo-Noam et al., 2009). Infancy to middle childhood, however, is an important period of empathy development. Particularly in the earliest years of development, children's brains have greater capacity to change due to having almost twice as many neural connections in the brain than in adulthood. As children observe and experience the world around them, some of these neural connections are reinforced, and others are pruned. These interactions have the potential to provide children a solid foundation for empathy, which then can be reinforced as they grow. Additionally, empathy development during childhood results from children's language and social-emotional skills that are developing in the first years of life (see Appendix A).

Early childhood also is a rich period of learning through relationships. The distress response of newborns to another infant's cry supports the idea of a biological predisposition for empathy (Martin & Clark, 1982). During the first few months of life, the establishment of a secure and loving relationship between an infant and the caregiver provides an important foundation empathy and social and emotional learning, more broadly. Babies start using social referencing around 6 months of age (for example, a baby looking at the face of a parent to gauge his/her reaction to a new situation or person, with the parent's reaction influencing how the baby responds). During the first year, babies express feelings through non-verbal communication and begin to associate emotions with words and expressions, often imitating others' emotions and expressions. Babies cannot fully differentiate their selves from others and have only basic emotion regulation capabilities.

During the second year of life, there is the transition from concern for the self to a capability for concern for the other (Knafo-Noam et al, 2008). Around 18-24 months of age, toddlers begin recognizing themselves in a mirror, reflecting their understanding of themselves as separate persons. As toddlers, they also are just starting to develop a theory of mind, which will allow them, as they grow, to become able to accurately imagine another's experience. During this time and in the months that follow, they are growing in their ability to recognize their own emotions, show an understanding of the emotions of others, and respond to emotional cues, such as showing concern through efforts to help or comfort another. Most toddlers engage in some helping behavior in response to real or simulated distress by age two, moving from primarily physical helping behaviors to a wider variety of helping behaviors by 18 to 20 months, such as verbal comfort, sharing, distracting the person in distress, and even advice (Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). Across toddlerhood and as children reach the third year of life, they are able to express verbal and facial concern and interest in another's distress, and continue to engage in an expanding variety of helping behaviors.

While children experience affective empathy in some form as early as infancy during toddlerhood, children's cognitive empathy (perspective taking) increases significantly during the preschool and elementary years, alongside growing language capacities. Thus, during these early preschool years, they often are using words to express emotions and more accurately recognizing and responding to emotional expressions of others. As they move through the preschool

years toward kindergarten, their abilities to understand their own emotional reactions continue to grow, as do their abilities to notice, understand, respond to, and anticipate the emotions of others.

By the time children are four or five, they usually can see a situation from the perspective of another, indicating a developed theory of mind (Wellman et al, 2001). This ability to understand the perspective of another is necessary for transforming the earlier-developed affective empathy to a more other-focused experience, toward viewing the situation more accurately and responding with empathic concern and more effective helping strategies.

In addition to cognitive learning theory and social learning theories, moral reasoning and behavior theories are relevant in the context of empathy development. Moral development is greatly influenced by family, community, and cultural contexts. Moral development is also in the context of social expectations and norms, and like social learning, is influenced by ongoing observations and interactions with the social world. Moral development provides insight into empathy development. For example, a younger child may need a rule to guide behavior, and later can be guided to moral behavior through reasoning.

It is important to note that empathy is a complex and dynamic process that requires multiple higher order functions, such as emotion recognition, multimodal sensory integration, self-other distinction and continuous processing of valence and intensity information (Tousignant et al., 2017). In neuroscience literature, and as described earlier, the concept of empathy is considered to include separate affective (sharing others' emotions) and cognitive (understanding others' emotions) components (Mackes et al., 2018). The affective and cognitive aspects of empathy may involve partially non-overlapping brain regions. Research has identified distinct clusters of brain regions involved in affective empathy: the inferior frontal gyrus, the medial/anterior cingulate cortex, the anterior insula, and the supplementary motor area (Mackes et al., 2018). Cognitive empathy has been situated within the bilateral superior temporal sulcus, temporo-parietal junction, and temporal pole. Recent imaging studies by Mackes et al. (2018) suggest fluctuation in perceived emotional intensity correlated with activity in brain regions previously implicated in cognitive empathy and in brain regions associated with affective empathy. Empathic accuracy (successful tracking of others' emotions), however, was only related to brain regions that have been implicated in cognitive empathy (Mackes, et al., 2018).

Brain systems relevant to the affective aspects of empathy develop earlier than those relevant to the cognitive aspects of empathy, and thus a differential developmental pattern, where the cognitive aspects of empathy develop later than its affective aspects, has been suggested (Malti, Chaparro, Zuffiano, Colasante, 2016). This is consistent with earlier research suggesting affective components of empathy may emerge as early as toddlerhood, whereas cognitive components gradually increase from early to late childhood (Davidov, Zahn-Waxler, Roth-Hanania, & Knafo, 2013). Hoffman (2000) similarly states empathy is strongly entwined with social-cognitive development, consequently changing as children develop increased social-cognitive capacities. Similarly, emotion regulation skills have been shown to increase from infancy to adolescence. Changes from external to internal sources of regulation along with other developing regulatory capacities (effortful control, delay of gratification, and attentional control) promote increasing empathic capacities from early childhood to adolescence (Eisenberg & Eggum, 2009).

Supporting Empathy Development

While the mirror neurons involved in empathy are considered "hardwired" and to some degree automatic, certain biological conditions affect how well mirror neurons function and grow. Thus, empathy development is influenced by neural development, as well as genetics and temperament (Zahn-Waxler et al., 1992). Additionally, the strength and effectiveness of their functioning can be supported through socialization and developmentally responsive strategies and support (Goldman, 2014).   In other words, children are born with the capacity for empathy, yet empathy should

be nurtured throughout their lives. The following are general strategies for supporting empathy development in the context of early childhood and throughout childhood:

- Interact with young children with "warmth," as caregiver warmth (and particularly maternal warmth) has been shown to be an important factor in promoting empathy development (Zhou et al., 2002). Parents and /or caregivers who provide a warm, positive environment for their children were more likely to have empathetic children.

- Foster secure attachment relationships with parents/caregivers. Children who are securely-attached to parents engage in more empathic responding than children who are not as securely attached (Kestenbaum & Sroufe, 1989). Fostering secure attachments helps children know they are emotionally and physically supported. This allows them to take more emotional risks, such as reaching out to someone who needs help (Barnett, 1987).   Kochanska, Forman, Aksan, and Dunbar (2005) found children who had a responsive and shared positive relationship with a parent (particularly maternal relationships) were more likely to respond empathically to a person in distress

- Support children's emotion and behavior regulation skills. Helping children learn to constructively cope with their own negative emotions through emotion coaching also helps them build the self-regulation skills that are associated with empathic concern for others (Song, Colasante, & Malti, 2018).

- Help children strengthen their face-reading skills (Parker, Mathis, & Kupersmidt, 2013), as it is difficult to show empathy if children can't read facial expressions well or misidentify facial expressions and body language.

- Talk with children about their thoughts and feelings, helping children find labels for the emotions they feel themselves and observe in others. Also, talking about the causes and consequences of specific emotions as they are encountered supports emotional self-awareness (Castro, Halberstadt, Lozada, & Craig, 2015).

- Use "everyday moments" to remind children to "switch on" their empathy mode (Dewar, 2020); just asking children to pause and reflect on what other people are feeling can be a powerful reminder for children to draw from their empathic capacity. Similarly, use these moments as an opportunity to notice and talk about when someone shows empathy or a lack of empathy in daily life, discussing why empathy is important and the consequences of lacking empathy (MCC, 2018).

- Use "everyday moments" to practice empathy, such as when conflicts come up. Adults support empathy development when they give children a voice and listening carefully to their views, while also asking them to listen carefully to and consider the views of others (MCC, 2018).

- Model empathy. Children learn empathy both from experiencing adults' empathy for them and from watching adults close to them show empathy for others and sensitivity to the needs of others (MCC, 2018).

- Use role playing, fictional stories, and real-life narratives for supporting children's perspective-taking skills. Following a story, asking questions such as, what do the characters think, believe, want, or feel and how do we know that? These questions help children learn about the way other people's minds work. Ornaghi, Brockmeier and Grazzani (2014) found children who participated in such conversations following stories conversation group showed greater and enduring gains in emotion comprehension, theory of mind, and empathy.

- Help children learn to look for what they have in common with others. Just as adults tend to feel greater empathy for those they perceive as similar to them, children also find it easier to empathize with someone who is familiar or perceived as similar to themselves (Smith, 1988). Similarly research suggests people are more likely to demonstrate empathy with those with whom they have close relationships (Gable & Reis, 2010).

Foster a sense of connection and interdependence with others, as empathy is shown to be higher in cultures that emphasize interdependence between self and others than in those that emphasize independence and individualism (Markus & Kitayam, 1991).

- Expand children's circles of concern and caring actions. While it is easier to have empathy for people close to us or similar to us, model for children empathy, appreciation and caring for many types of people, not just those close to you and not just those who are like you. (MCC, 2018). Help children learning to "zoom in" to tune in carefully to others, but also "zoom out," taking in multiple perspectives of people. Emphasize the importance of really listening to others, and also the importance of considering the feelings of those who may be vulnerable; help guide children toward some simple but relevant and appropriate ideas for taking action (MCC, 2018). Also model "doing with" not just "doing for" others, in caring and service-oriented actions.

- Reduce stress in children's lives. Stress can inhibit proper mental and emotional functioning. There is strong evidence in the research literature regarding time in nature and reduced stress, anxiety, and depression, as well as improved physical and mental health overall. Time in nature, according to Peter Kahn, University of Washington, can soften negative conditioned mental patterns: "If you can find nature, engage with it and get your heart rate down, then your mind begins to settle. When your mind isn't ruminating, it can then open to a wider world, where there's great beauty and healing." Nature's calming qualities allow children to attend to the deeper, more emotional lessons of life.

In addition to strategies such as these, there are many, often school-based, interventions to support empathy within the context of SEL (for example, see Figure 3). The literature on SEL suggests interventions beginning earlier in development and continuing longer result in greater and more enduring benefits than shorter interventions that begin later (Ramey & Ramey, 1998). Additionally, there is evidence to support the strategy of early intervention supplemented by later intervention, toward gaining the most beneficial and enduring outcomes (Landry, Smith, Swank, & Guttentag, 2008).   However, there is not yet evidence to suggest that empathy interventions after a certain age are less effective, but instead that interventions should be "timed" across development, based on the component of empathy (affective v. cognitive) being addressed (Malti et al., 2016). Developmentally tailored intervention strategies are necessary in the context of supporting empathy development and SEL generally, as a mismatch between a child's capacities and a practitioner's perceptions of those capacities can greatly reduce the intervention's efficacy (Noam & Hermann, 2002). And because levels of empathic capacity vary across developmental periods, within developmental periods, and even across children of the same chronological age (Eisenberg, Spinrad, & Morris, 2014), it is important for empathy interventions to consider the normative trajectories of empathy and ideally assess inter-individual differences prior to intervention delivery. In essence, effective interventions align with and adapt to varying levels of empathic capacity within age groups (Malti et al., 2016), as researchers are beginning to understand how baseline differences in empathy and related social-emotional skills can result in intervention strategies being more effective with certain children and families than others (Malti & Noam, 2009). Some children, regardless of age and background, may show relatively high levels of baseline empathy-related responding, relative to others; and thus chronological age is only a rough estimate of developmental capacity at any point in time (Durlak, Fuhrman, & Lampman, 1991).

In addition to the importance of *developmentally-responsive interventions* and *embedding empathy interventions within SEL*, research has shown that effective programs provide *repeated opportunities to practice new skills and behaviors within the program structure and beyond to real-life situations* (Durlak et al., 2011). Repeated practice at taking another's perspective is more effective than one-shot or infrequent efforts to do so (Pecukonis, 1990). Particularly for young children, the ability to imagine and gain insight into another person's point of view does not come easily, and thus sustained practice at role- or perspective-taking is an effective means to increasing levels of empathy (Pecukonis, 1990). Also, the analysis by Malti et al. (2016) suggests that empathy interventions should *support*

empathy-related responding in its entirety, as targeting higher numbers of empathy-related constructs were associated with intervention efficacy.

Program	Early Childhood	Middle Childhood	Early Adolescence	Empathy-Related Construct(s)
1. 4Rs Program	•	•	•	EU, PT, PB
2. Caring School Community	•	•		E, PB
3. I Can Problem Solve	•	•		EU, PT, PB
4. Incredible Years School Dinosaur Program	•	•		EU, E, PT
5. Michigan Model for Health	•	•	•	EU, E, PB
6. Mind Up	•	•	•	EU, PT, PB
7. Open Circle	•	•		EU, PT, PB
8. PATHS	•	•		E, PT, PB
9. Peace Works: Peacemaking Skills For Little Kids	•	•		E, EU, PB
10. Raising Healthy Children	•	•		PB
11. Resolving Conflict Creatively Program	•	•	•	E, EU, PB
12. RULER	•	•	•	E, EU, PT
13. Second Step	•	•	•	E, EU, PT
14. Steps to Respect		•		EU
15. Too Good for Violence	•	•	•	EU, PB
16. PeaceBuilders	•	•		PB
17. Anger Coping Program		•	•	EU, PT
18. Interpersonal Skills Program	•			E, EU, PT, PB
19. Big Brothers/Big Sisters		•	•	PB

Note. Early childhood: Pre-K-1st grade.   Middle childhood: 2nd-6th grade.   Early adolescence: 7th to 9th grade.
E = Empathy. EU = Emotion understanding. PT = Perspective taking. PB = Prosocial behavior.

Figure 3 Summary of Evidence-Based Programs, Grades Targeted, and Empathy-Related Constructs Promoted (directly from Malti et al., 2016)

Empathy with Animals and Conservation Behavior

Empathy is one of a number of seemingly similar dispositional constructs that are intertwined in discussions of motivating conservation attitudes and behaviors. Other constructs in the conservation literature that could be perceived as similar to empathy include the following:

- *Emotional affinity toward nature:* feeling positive emotions for nature (such as oneness, love, freedom and safety) and a cognitive interest in nature (Kals, Shumacher, & Montada, 1999);

- *Biophilia:* our innate tendency and affinity toward the natural world (Kellert & Wilson, 1995);

- *Connectedness to nature:* an affective and experiential relationship with nature and the inclusion of nature in one's cognitive sense of self (Mayer & Frantz, 2004);

- *Nature relatedness:* an internalized identification with nature, reflecting feelings and thoughts about one's connection to nature); an external, nature-related worldview; and a physical connection to the natural world (Nisbet, Zelenski, & Murphy, 2009); and

- *Environmental identity:* an aspect of one's sense of self, which considers how one identifies with the natural world, based on history and emotional attachment, that affects the ways in which we perceive and act toward the world; a belief that the environment is important to us and an important part of who we are (Clayton & Optow, 2003).

Like empathy, these constructs have their roots in early childhood. Empathy, however, is distinct from these constructs in that it is other-oriented, rather than self-oriented. Empathy involves perceiving, understanding, and caring about the experiences or perspectives of others.

There are other "other-oriented" constructs similar to empathy that have been studied in conservation contexts. Empathy in the context of conservation also seems similar to *environmental sensitivity,* which is a set of affective characteristics that result in an individual viewing the environment from an empathetic perspective (Sward & Marcinkowski, 2005). Sward and Marcinkowski (2005) suggest that while environmental sensitivity itself is viewed as an affective variable, its development appears to result from an interplay of outdoor experiences, favorable human interactions, and knowledge about the natural environment. *Conservation caring* has been used by Rabb and Saunders (2005) and includes cognitive elements toward valuing nature, affective elements stemming from experiences, and caring actions. More recently, Skibins and Powell (2013) use conservation caring more generally to describe and measure one's connection to a species, capturing how zoo visitors' think, feel, and act for a specific species. *Compassion for animals* also is other-oriented; yet, empathy involves emotional sharing, which is a key defining component of empathy (see Figure 1).

There is limited research exploring the extent to which the mirror neuron functioning of emotional sharing that allows for empathy can take place between humans and animals, but initial evidence suggests it may (Myers, 2007). Environmental writer David Sobel has been a longstanding proponent for empathy in the context of conservation efforts (1996). He suggests empathy needs to be fostered in young children, as it serves as a foundation for environmental stewardship as children grow. Research similarly suggests action for the environment is sometimes motivated by feelings of empathy. Shelton and Rogers (1981) found those who had taken the perspective of a suffering animal exhibited stronger compassion and intention to protect that species than those who had not taken on the animal's perspective. Berenguer (2007) found a relationship between empathy for other living things and adults' intention to engage with nature or protect it. Studies by Tam (2013) similarly suggest a positive relationship between empathy with nature and support for and frequency of environmental behaviors. Czap, Czap, Lynne, & Burbach (2015) found that people who were asked to put themselves in the place of people affected by a conservation issue were more likely to support conservation action. Similarly, in research by Pfattheicher, Sassenrath, and Schindler (2016) found those who feel compassion for other humans were more likely to hold pro-environmental values and intentions, and also more likely to promote conservation of nature. While this may suggest a transferability between empathy toward humans and empathy toward nature, it also may be reflective of Tam's (2013) speculation that for those who consider themselves part of nature, empathy with humans may entail empathy with nature and vice versa.

It is also thought that empathy toward an animal can activate empathy more broadly toward the natural world (Schultz, 2000; Sevillano, Aragones, & Schultz, 2007). For example, research by Berenguer (2007) suggests those who took on the perspective of a suffering animal or tree felt more compassionate toward that animal or tree, but also more obligated to help it, as well as help nature as a whole. Tam (2013) uses the broader term dispositional empathy with nature, defining it as the understanding and sharing of the emotional experience, particularly distress, of the natural world. Tam's (2013) research suggests emotional sharing, perspective taking, and empathic concern predict biospheric concern more broadly, and, as noted prior, correlate with support for and frequency of environmental behaviors. Young, Khalil, & Warton (2018) advise caution is needed though, referencing personal communication with

Myers (2015), who suggests the strength of the relationship between empathy and behavior is based on how closely the behavior is linked to the emotional experience. For example, feeling empathy for a pet on a hot summer day is more likely to trigger the behavior of setting out a bowl of water than donating to a campaign to save wildlife habitat. Thus, empathy can play a role in environmental behaviors, but may not be sufficient toward achieving conservation behaviors, particularly when the behaviors are abstract or complex, or when barriers come into play (Young, Khalil, & Wharton, 2018).

In addition to empathy sometimes motivating pro-environmental behavior, a number of studies with adults show that pro-environmental behavior or the intention to engage with nature or protect it is predicted by other measures of emotional and cognitive connection, such as ecocentric perspective-taking (Schultz, 2000) and a sense of inclusion or connection with nature (Hinds & Sparks, 2008; Mayer & Frantz, 2004; Schultz, 2001). Kals, Schumacher, and Montada (1999) found that time in nature, often in childhood with family members, predicted emotional affinity with nature, which in turn predicted the intention to protect nature. These findings are consistent with Clayton's (2003) conception of an environmental identity, where one's perception of and actions toward the world are affected by our history of interacting with and emotional attachment to the environment.

And while these emotional or cognitive connections to the natural world, like empathy, are not a sole nor potentially even necessary antecedent to conservation action, the relationship between connections to nature and conservation behavior is grounded in a body of empirical studies (Beery & Wolf-Watz, 2014). The relationship, though, is complex and multifaceted. Research by Skibins and Powell (2013) suggest that while visitors' preexisting levels of connection to wildlife were not a predictor of species-oriented nor biodiversity-oriented conservation behaviors, their connection to a specific "flagship" species was a predictor of species-oriented conservation behavior (but not biodiversity-oriented behavior). However, Gosling and Williams (2010) suggest feeling connected to nature may enhance dispositional empathy with nature, and empathy likely mediates the relationship between connection to nature and conservation behavior. This grounds the strategies and initiatives underway within the zoo and aquarium community to foster wildlife connections and empathic concern toward motivating conservation behaviors, either on an individual species or ecosystem scale. Yet, it is important to recognize the complexity and non-linear nature of factors associated with conservation behavior. Likewise, research regarding empathy toward nonhumans is still relatively recent and sparse. While more research is needed, Tam (2013) advises taking the construct of empathy seriously in our quest to understand and promote humans' relationship to nature, as well as to motivate conservation behavior.

Supporting Empathy with Animals

Research suggests empathy toward animals develops similarly as empathy toward humans (Ruckert, 2016). Empathy develops over time and is reinforced and supported (or in some cases discouraged) through children's interactions with the world. As children grow and as their brains develop, they are able to move from simple affective responses to more complex, nuanced and abstract reasoning. This allows for children to transition from seeing animals as anthropomorphic peers to predict or imagine the experiences and perspectives of animals very different from themselves (Ruckert, 2016).

The Seattle Aquarium (2019) provides a concise and useful summary of this development:

> Young children are more likely to see animals as anthropomorphic peers. … At a young age, children struggle to recognize a reality separate from their own, and they have not developed ways of expressing or understanding that the animal's wants, needs, and intentions may be different from their own.

In kindergarten, the ability to read nonverbal cues and infer meaning from behavior drastically improves, as does the ability to use language. During this time, there is a natural bonding between children and animals. However, animals, unlike people, cannot express their wants and needs in a common language, so children continue to project an animal's wants and desires from their own experiences, knowledge, and the animals' actions. As children begin to understand that animals can choose to interact with them or not, moments when the animals appear to choose to interact with them become very powerful child-animal connection builders.

As children mature through adulthood, their ability to comprehend language and express their needs improves. They become more socialized and base their moral understanding on social expectations of love, empathy, trust, generosity, kindness, sharing, and fair treatment. Understanding of diverse perspectives develop in elementary school as children practice and expand their understandings of social-moral norms, interpersonal expectations, theory-of-mind, and relationships with others. Along with their understanding of language and social norms, they are developing their ability to reason. Young children base their reasoning on concrete observations and logic. … As children learn, they begin to grasp more abstract ideas and concepts. … Theorists suggest that throughout our lives, we can continue to develop our ability to grasp other's complex, multidimensional, and distant perspectives (p. 5-6).

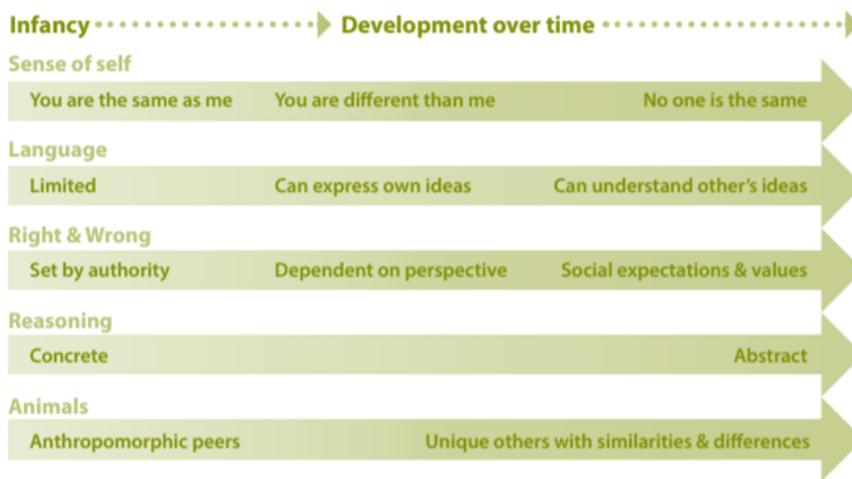They also summarize this development over time through the following figure

Figure 4 Development of Empathy with Wildlife over Time (directly from Best Practices in Developing Empathy toward Wildlife, Seattle Aquarium, 2019, p. 6)

As evident from this description and the summary figure above, the development of empathy toward humans and empathy toward wildlife do not appear to be different processes, nor does one need to precede the other (Myers, 2007). Yet, they are not reducible to each other (Tam, 2013). While the psychological process known to be associated with empathy with humans apply to empathy with nature, the exact parameters in these processes are target-specific (Tam, 2013). For example, interpersonal closeness (connectedness with others) enhances empathy toward people, and

connectedness to the natural world appears to promote empathy with nature (Tam, 2013, citing Gutsell & Inzlict, in press). However, it may be that for those for whom the boundary between humans and nature is blurred (those who consider themselves part of nature or those who consider nature to be humanlike), it is possible that empathy with humans actually entails empathy with animals and/or nature and vice versa (Tam, 2013). Also, some have suggested that since children are biologically hard-wired to nature, they may be more responsive to learning born out of nature. Children may find it easier to relate to and bond with animals, and thus learning empathy in the context of animals may serve to support the development empathy with humans.

Recently, zoos and aquariums have become invested in developing empathy toward animals among their visitors, due to the empathy being thought to be a motivator and predictor of conservation behavior. However, researchers caution that too much empathy can result in overloading, which then leads to people disengaging rather than engaging in empathic concern and actions. The following are suggestions in the growing body of literature regarding supporting the development of empathy with animals:

- Use anthropomorphism, but carefully. It can help children (particularly young children) relate to, understand and empathize with animals (Myers, 2007). Anthropomorphism also can be an initial point for engaging learners and moving them to more accurate understandings (Young et al., 2018). But anthropomorphism can lead to over-projecting, inaccurate empathy, and sometimes behaviors that people think are helping animals, when in fact their behaviors may be harmful.

- Intentionally frame an animal in a more story-like manner to give the animal individuality and personality (Myers, 2007). When empathy is the goal, the narrative about the animal should acknowledge the animal as a living individual that experiences the world from its own unique perspective (Seattle Aquarium, 2019). Sharing information that draws on similarities between the animal and humans helps learners recognize the animal has a subjective experience and intentions that should be respected. Consider the negative effects of language choice and narrative framing surrounding animals, as these can dissuade empathy (for example, referencing an animal as "it" or movies that portray animals as malicious or evil) (Young et al., 2018).

- Support the development of accurate empathy. Building children's cognitive knowledge about an animal (such as why the animal behaves as it does) can support accurate empathy. Helping children recognize similarities and differences between human and non-human animal experiences can also support the development of accurate cognitive empathy (Young et al., 2018). Further, supporting the development of children's understandings of their own emotions can help them better understand and more accurately perceive the experiences of others, including animals. Additionally, developing children's own emotional awareness can help them recognize when their own emotions (such as anger or pain) causes them to over-perceive these emotions in others or in animals.

- Model empathy. Role models, in general, influence the values, thoughts, and actions we perceive as important and valuable (Chawla, 2009). Having long-standing, positive relationships with children provides opportunities for modelling and encouraging empathy and caring behaviors toward animals. Physically model the empathetic behaviors desired. Encourage parents to serve as moral role models, by engaging them and modeling ways of interacting, asking questions, and talking about and caring for animals with their children (Seattle Aquarium, 2019). Also, it is helpful to model empathy and care for traditionally uncharismatic species, as helping children learn how to handle or care for species that often elicit aversion can lead to more positive attitudes toward these species (Akerman, 2019).

- Activate the imagination. Imagining circumstances from an animal's point of view (perspective-taking) can happen through a variety of ways, such as reflection, story-telling, role-playing, and mimicry (Myers, 2007).

When children taken the perspective of another, whether than be cognitively or physically, they have an opportunity to practice empathy that can lead to concern for animals' well-being (Berenguer, 2010). Story-telling from the perspective of the animal can also support perspective-taking.

- Provide frequent and on-going opportunities for children to directly observe, interact with and care for animals. It may be particularly helpful to provide experiences with animals that elicit empathy: animals that present social roles similar to human behaviors; animals that show emotion; animals that are easily understood as whole animals and have eyes that are strongly present; and animals that allow for visitors to spend longer periods of time with them and/or appear to choose to interact with humans on their own agency (Myers, 2007). Conversations with children to help them understand the animals' intent, motivation, and purpose of behaviors are also helpful.

- Beyond spending time with animals, provide regular opportunities for children to practice empathy for animals and receive positive feedback when children exhibit empathy. This can help build children's self-efficacy and work toward building their environmental identities. This might include providing opportunities for children to care for, feed, and even train animals, while discussing how to know what different animals need, as well as positively acknowledging when empathic expressions and behaviors are displayed (Seattle Aquarium, 2019).

- Provide time for children to interact with, get to know and bond with nature. Firsthand, direct interaction can be a starting point for connections and care, both with nature and also with wildlife. Fostering affinity toward nature/biophilia in children may be useful in this context as well, since emotions of caring, love, and a sense of connection correlate to a desire to help/protect species as adults (Mayer & Frantz, 2004). Affective empathy response may be related to biophilia, our innate tendency and affinity toward the natural world (Kellert & Wilson, 1995), and an inherent affective relationship between children and animals has long been a powerful building block for establishing care for the natural world (Kellert, 2002). Likewise, Gosling and Williams (2010) suggest feeling connected to nature may enhance dispositional empathy with nature, and empathy likely mediates the relationship between connection to nature and conservation behavior.

- Related to the prior strategy, support interactive socialization regarding children's interest in wildlife and nature. As Chawla (2009) explains, a child's experiences are not just shaped by a socializer's beliefs and behaviors, but also by how the socializer reacts to characteristics of the child and the memories that they form together. While parents and caregivers can provide opportunities for children to spend time interacting with and in nature (socialization), it is also important that they respond to children's display of interest in ways that reinforce and further that interest, such as tolerating mud, collecting natural items, and touching insects (interactive).

Another helpful way to think about these strategies, by age, is through the following figure from Como Park Zoo and Conservatory's Visitor Interaction Guide (VIG).

TODDLERS-PRESCHOOL AGES 2-5	ELEMENTARY SCHOOL AGES 5-12	MIDDLE-HIGH SCHOOL AGES 12-18	ADULTS AGES 18+
Use animal **names** and pronouns. Compare an animal's or plant's physical **characteristics** with our own. **Model**, practice, and reward empathic behaviors with real or pretend plants and animals. Encourage simple, frequent **interactions** with real plants and animals. Tell **stories** from the perspective of an animal or plant. Allow **anthropomorphism*** – it helps build meaningful connections.	Frame an animal as an **individual** with a specific story and personality. Compare an animal's experiences and **behaviors** with our own. Provide **opportunities** to interact with live animals and plants. Engage in storytelling and **role-playing** from the perspective of an animal or plant.	**Compare** an individual animal or plant at Como to its species or wild counterparts. Share **information** that helps them better understand the needs of different plants and animals at Como and in the wild. Guide them toward more **enlightened** anthropomorphism by highlighting either our similarities or differences.	Encourage **cognitive**** and **affective**** empathy for Como's plants and animals. Direct **compassionate**** empathy toward wildlife outside of Como. **Model** ways for caregivers to encourage empathic language and behavior with children. Have them take the **perspective** of an animal or plant to assist in conversations around welfare and conservation.

Figure 5 Strategies to Support Empathy with Wildlife (Como Park Zoo & Conservatory's Visitor Interaction Guide)

Assessing Empathy

There are several common approaches to assessing empathy in children, yet each has limitations that are important to consider when selecting an assessment approach (Miller & Eisenberg, 1988):

- Using stories, pictures, audio or video to assess the perception of emotions portrayed through them (limited in that simple emotion recognition and/or identification does not reflect an individual's likely cognitive understanding or responsiveness to an empathy-inducing scenario; also limited in that infants and young children show responsiveness to others' emotions before they are able to express or define an emotion lexicon);

- Assessing empathy through visual or story-based scenarios alongside a child self-report or interview (limited in that this approach can be time consuming, and also in that scenarios are often to simple and don't reflect the complexity of most real-life social and interpersonal situations; also limited by children's levels of receptive and expressive language, as it is not always clear if the assessment is measuring empathy, or children's ability to verbalize and comment upon the story, or their understanding of the story);

- Assessing empathy behaviors through self- or other-report questionnaires (limited due to observer expectancy and observer bias; also limited by the lack of a normative basis of comparison for teachers, parents or peers, and biases in the reporting of positive or negative emotionality); and

- Assessing empathy through experiments that induce and then measure physiological responses, such as elicited facial or gestural reactions or neurophysiological measurements to emotional depictions (limited in that is challenging to distinguish among physiological responses for empathy, sympathy and distress).

In addition to the limitations mentioned, assessing empathy is challenging due to a lack of comprehensive measures that tap all three dimensions of empathy and a lack of measures that have been validated for use with children. For example, the *Interpersonal Reactivity Index (IRI)* (Davis, 1980) is one of the more common empathy self-report measures, comprising four subscales (empathic concern, perspective taking, fantasy, personal distress/emotional regulation); but it has been validated with young adults and adolescents. Another frequently used assessment that has been validated with children is the *Index of Empathy for Children and Adolescents (IECA)* (Bryant, 1982). However, this assessment focuses on emotional responses to situations as opposed to measuring general affective empathy. With this instrument, school-age children are asked to indicate how much each statement is like or unlike them, and their empathy score reflects the children's perceptions of their own empathic feelings ("felt empathy").

The lack of assessments for measuring empathy in children prompted the development of the *Empathy Questionnaire (EM-QUE)* (Rieff, Ketelaara, & Wiefferin, 2010), which is a parent questionnaire measuring emotional contagion, attention to others' feelings, and prosocial responses to others' emotions. There is a version for children ages one – six (validated in infants and toddlers, it seems). This version is comprised of a 20 item questionnaire completed by parents (see Appendix B), and there also appears to be a version for children and adolescents, ages ten and older. As part of the validation of this instrument, an *Emotion Expression Questionnaire (EEQ)* (Rieff et al., 2010), was designed and used. This instrument is a 35-item parent-report questionnaire, measuring emotion expression of the child through three subscales: Emotion Regulation (8 items), which indicates the extent to which children can calm themselves or be calmed by their parents when angry or sad; Others' Emotion Recognition (6 items), which indicates the extent to which the child can recognize the parents' and others' emotions; and Emotion Understanding (6 items), which indicates the extent to which children can evaluate an emotional episode. Additionally, the *Empathy Task,* was also designed and used in the validation of the EM-QUE, as referenced in Rieff et al. (2010). This task examines children's responses to three separate "acting" tasks displayed by the task administrator (happiness with a pen, anger with a pen that fails to write, and pain/sadness while burning one's fingers on a cup of tea). Following each acting performance, the task administrator scores the child's reactions on a checklist that consists of two scales: (a) Attention to Others' Emotions (6 items) and (b) Consolation Behavior (5 items, but not used on the happiness with a pen event).

Additionally, the *Compendium of Preschool through Elementary School Social-Emotional Learning and Associated Measures* (Denham & Hamre, 2010) was used to identify possible empathy assessments that are appropriate for use with children. Within the compendium, measures are identified by age (preschool v. school age) as well as dimension of social-emotional learning assessed. A review of this compendium yielded another empathy measure for preschoolers, the *Southampton Test of Empathy for Preschoolers* (Howe et al., 2008); see Appendix C. This assessment uses eight video vignettes of children in emotional scenarios to assess and understand a child's ability to understand (STEP-UND) and share (STEP-SHA) in the emotional experience of a story protagonist. While this assessment is in the public domain and available for use, via https://www.isurvey.soton.ac.uk/814, it requires a child to progress through all eight vignettes and thus could be quite time consuming (and potentially a child would tire prior to completion and thus no score yielded).

An online search of empathy instruments for children yielded the *Young Children's Empathy Measure* (Poresky, 1980). This assessment was developed as an empathy measure which could be included in a one-hour in-home parental interview and child assessment. It is comprised of four verbal vignettes or narratives for home visitors to read to preschool children to probe their cognitive understanding and affective responses to situations involving sadness, fear, anger, and happiness. The *Young Children's Empathy Measure* requires no equipment to administer, is much shorter than earlier empathy scales, and written simply enough to be well comprehended by children as young as three years

old. Four verbally presented vignettes assess the child's ability to identify sadness, fear, anger, and happiness in a very short story. For each of the four vignettes, an interviewer elicited and wrote down the child's responses on the two aspects of empathy by asking the child "How does the child feel?" (cognitive perspective taking) and "How do you feel about this?" (affective perspective taking). The accuracy ratings for the perspective taking responses were: 4 = exact match to the intended emotion; 3 = similar emotion; 2 = some emotion; 1 = non-emotional response; and, 0 = no response. Empathy scores were calculated by averaging the eight accuracy scores for each child. The empathy vignettes are:

- Sadness-"A child has just lost its best friend."
- Fear-"A child is chased by a big, nasty monster."
- Anger-"A child really wants to go out but is not allowed."
- Happiness-"A child is going to his/her favorite park to play."

The vignettes were also administered with "dog" as the subject of each of the four statements to assess the children's empathy toward pets (dogs specifically) and to assess the generalizability of the empathy measure. Reliability and validity analyses of this instrument lead the author to describe it as a valid and developmentally appropriate instrument with acceptable reliability.

Given the interest of organizations such as zoos and aquariums in empathy in the context of conservation behavior, it is important to consider the assessment of empathy in animal, wildlife, or nature contexts. Led by Kathryn Owen Consulting and three accredited zoos and aquariums in the Pacific Northwest, there is a collaborative assessment project underway aimed at developing tools to assess program effectiveness in encouraging children's empathy toward animals. Project partners (Woodland Park Zoo, Point Defiance Zoo & Aquarium, & Seattle Aquarium) aim to develop, test and share tools that can be used by accredited zoos & aquariums to assess whether their educational programs are having the desired impact of encouraging children's empathy towards animals. Thus far, the following tools have been produced (tools can be found at https://www.informalscience.org/measuring-empathy-collaborative-assessment-project):

- *Expressions of Empathy and Related Emotions towards Animals:* Observational Framework and Code sheet (for use with a variety of ages and settings; assesses if program participation elicits audience expression of empathic behaviors, and if participation encourages expression of related positive emotions, such as respect, appreciation, curiosity, etc.?);

- *Empathy towards Animals: Pre/Post Survey Protocol and Instruments* (for use with pre-teen and teenage youth; assesses attitudes toward animals (compassionate concern, appreciation, respect); perceived cognitive perspective-taking of animal; perceived self-efficacy pertaining to caring behaviors toward animals);

- *Semantic Differential Scale (One for age 10-13 years; One for 13 and older)* (versions for 10-13 year olds, and 13 and older; assesses if participation changes children's attitudes toward animals and perceptions of animal wellbeing);

- *Action Reaction Activity* (for first-third grade youth; assesses children's perspective taking (accuracy of student's emotion selection in response to scenarios), children's ability to predict or infer the state of an animal; and their ability to predict or infer the state of an animal based on an understanding of animals' needs); and

- *Conservation Pen Pals* (for second graders and older; assesses if children can take the perspective of other animals, demonstrate cognitive understanding of animals' needs, and show compassionate concern for other animals).

Implications and Recommendations for Lake Superior Zoo Preschool Empathy Project

- *Embed empathy into SEL development*, as they are intertwined in theory, research, and practice, as well as in MN Early Indicators of Progress/Benchmarks. In addition to general strategies to support empathy development, and letting empathy emerge naturally out of the grounding philosophical approaches and practices in a nature preschool setting, a specific, developmentally-tailored intervention/evidence-based SEL program could be helpful, particularly if it aligns with Minnesota's ECIP, embeds empathy (and empathy in its entirety) into SEL, and if it provides repeated opportunities to practice new skills and behaviors within the program structure and beyond to real-life situations. It might be useful to consider potentially a program such as Second Step or PATHS, particularly if that program has been used successfully with diverse (SES, racial, ethnic) preschool programs.

- In addition to building empathy with humans and SEL, *embed the strategies for supporting empathy with animals into nature preschool programming*.

- Integrate *efforts to build children's connections with nature, increase children's affinity with nature/biophilia, and support children's environmental identities.* (See earlier sections for the rationale). Efforts to foster connections, increase affinity, and support environmental identities include providing children with frequent, ongoing, and sustained periods of time for experiences with and in nature, in the company of a caring adult (unstructured play primarily with some developmentally-appropriate guided nature learning). This is philosophically part of nature preschools' use of unstructured play and an authentic emergent curriculum and will likely happen simply as a part of what the Zoo Preschool would unfold to do naturally. (See Appendix D for environmental identity development in young children).

- *Assess* the empathy intervention (which will be a "tangle" of nature preschool/nature play, empathy/SEL-curriculum, and intentional strategies to foster empathy with animals) *using developmentally-appropriate and relevant instruments to measure a) empathy with humans (affective, cognitive, and motivational empathy), b) empathy with animals (affective, cognitive, and motivational), and c) biophilia/nature affinity or nature connectedness.*

    1) Assess empathy with humans through the modification of the St. Louis Zoo instrument/Young Children's Empathy Measure/STEP online instrument, toward having four pictures/very short story vignettes in context of people (happy, sad, afraid, angry). This might involve modifying or developing the scenario/prompt/short story and then finding or obtaining a phot to represent each vignette, with potentially a girl version and a boy version. There questions would be asked for each vignette:
        - How would the little girl/boy feel? (cognitive empathy: feelings identification and perspective taking)
        - How do you feel? (emotional empathy: emotional sharing)
        - What would you do? (motivational concern) (asked for all vignettes but the happy one)

    2) Assess empathy for wildlife similarly (with 4 vignettes, but this time with a pet, such as a dog, or a different wild animal featured in the vignette; the same three questions would be used: how would the dog feel? How do you feel feel? What would you do?) (along the lines of the St. Louis Zoo instrument)

    3) If a second instrument is desired to assess empathy, in addition to the vignettes, the EM-QUE parent report may be a good option (recognizing the parent reports come with the potential for bias, as well as the "cost" of parents' time)

    4) Assess biophilia/affinity using the Affinity toward Nature Assessment, by Rice and Torquati (2013); (See Appendix E for details and Appendix F for other options)

5) Assess SEL through work sampling and less formal ECIP observation checklist (for each child, is each indicator in ECIP SEL domain: not shown, emerging, or proficient)

- Weigh research v. evaluation options:
    1) Frame this as an evaluation, with instruments administered by Preschool Director, as pre and post, and parents participating in the self-report as pre-post. This would be a pilot year, with potential in the future for a research study (measuring changes in and relationship among these three constructs, and how these changes and relationships compare to a farmyard nature preschool, a non-animal focused nature preschool, and a traditional non-nature preschool).
    2) Frame this as research, which is limited at this time due to non-human interaction between researcher and participant required by UMD, and potentially limited if a diverse control preschool is not utilized. The above instruments could be administered by the Preschool Director as a pre and post to zoo preschool participants. The EMQUE, which is parent self-report, could be distributed to parents of zoo preschoolers, and potentially to Little Barnyard, Stella Maris Academy Holy Rosary Preschool, and (Wind Ridge)? This would allow assessing changes in Zoo preschoolers empathy with humans, with wildlife, and affinity as well as a research question of did preschoolers' gains in empathy with humans (as measured by parent self-report) vary by type of preschool attended (nature, non-nature, nature plus farm animal focus, nature plus zoo/wildlife animal focus). IRB would likely approve this, as it can be done without interactions with participants (the evaluation piece could be framed as research, but done without researcher interaction, as the preschool director would administer to the zoo preschoolers, and the other preschools would only participate in the EMQUE). One downside is that if the other preschools are more homogenous and of higher SES than the Zoo preschool, it will be hard to compare across sites and know if differences are due to demographics v. programming. Another downside is that this school year may be overall an anomaly, with so many confounding factors affecting children, due to the pandemic.

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Appendix A: MN Early Childhood Indicators of Progress (2017) Social and Emotional Learning Domain

while empathy is intertwined throughout this domain, the highlighted sections below indicate strong and clear SEL connections with empathy

Self and Emotional Awareness Component of SEL

Subcomponent	0-1 year	1-2 years	2-3 years	3-4 years	4-5 years, K Readiness
SE 1 Confidence: Child demonstrates confidence "I am capable, I can experiment, I can make mistakes, and I can move on"	**S1.1** Independently prompts caregiver to meet basic needs **S1.2** Uses voice or body to show likes and dislikes	**S1.3** Independently attempts new challenges or activities that may or may not be successful **S1.4** Checks with and accepts support from adult or caregiver when necessary	**S1.5** Demonstrates or describes personal skills, likes, or dislikes **S1.6** Seeks help from adult to meet needs or solve problems **S1.7** Seeks out available social-emotional resources such as adults, peers or things for support	**S1.8** Demonstrates confidence in a range of abilities and expresses pride in accomplishments **S1.9** Consistently and effectively uses social/emotional resources such as adults, peers or things for support	**S1.10** Demonstrates increasing confidence and inclination to express opinions and ideas **S1.11** Engages in increasingly independent and self-directed activities **S1.12** Tolerates constructive criticism and manages setbacks, seeking adult support when needed
S2 Self-Awareness: Child demonstrates understanding and appreciation of uniqueness in own family, community, culture, and the world	**S2.1** Explores the world and environment around self and how things work	**S2.2** Demonstrates awareness of self as separate from others	**S2.3** Identifies self as part of the family, culture, community, or group **S2.4** Describes or labels self as a boy or girl	**S2.5** Demonstrates knowledge of family celebrations, traditions, and expectations	**S2.6** Shows increasingly accurate understanding of own strengths, preferences, limitations, and personal qualities
					S2.7 Demonstrates growing interest in and awareness of similarities and differences between self and others
S3 Emotions: Child demonstrates understanding of own emotions, others' emotions, and awareness of emotions becoming reactions and behaviors	**S3.1** Expresses emotions through facial expressions, sounds, and gestures **S3.2** Notices and responds to emotions displayed by others	**S3.3** Expresses feelings, needs, and wants with nonverbal communication, vocalizations, and a few words **S3.4** Associates emotions with words and expressions	**S3.5** Recognizes and describes own emotions **S3.6** Shows some understanding of others' emotional expressions	**S3.7** Uses words to express emotions **S3.8** Recognizes and responds to others' emotional expression	**S3.9** Demonstrates or describes increasing understanding of cause and effect around own emotional reactions **S3.10** Exhibits growing ability to understand and anticipate others' emotional reactions to situations or behaviors

Self-Management Component of SEL

Subcomponent	0-1 year	1-2 years	2-3 years	3-4 years	4-5 years, K Readiness
S4 Managing thinking: Child manages attention and thoughts	**S4.1** Briefly pays attention to environmental stimuli **S4.2** Indicates a choice with physical or vocal response	**S4.3** Focuses attention on preferred items and experiences **S4.4** Expresses thoughts by responding to simple choices and limits verbally or nonverbally, **S4.5** Anticipates and follows simple routines	**S4.6** Frequently pays attention to both familiar and new objects and experiences **S4.7** Chooses from a variety of options within the environment **S4.8** Responds to soothing or redirection when playing or learning does not go as expected	**S4.9** Attends for longer periods and persists through a broad range of adult-directed and child-initiated activities **S4.10** Makes self-directed choices from a greater variety of options **S4.11** Increasing ability to remember and follow simple two-step directions	**S4.12** Sustains attention and persistence with a task of interest for at least 5 minutes **S4.13** Talks through simple tasks and conflicts, seeking adult support as needed
S5 Managing emotions and behaviors: Child manages emotions, impulses, and behaviors with assistance from others and independently	**S5.1** Uses simple behaviors, objects, or movements to comfort and calm self with caregiver assistance **S5.2** Communicates needs or wants to adults using simple gestures, sign language, or sounds **S5.3** Uses sounds, sign language, or gestures to gain adult help to alleviate discomfort or distress **S5.4** Responds to adult efforts to calm or soothe **S5.5** Uses behaviors, objects, or movements to comfort self	**S5.6** Expands use of sign language, gestures, and a few words or phrases to communicate needs, wants, preferences, and discomforts to adults **S5.7** Actively seeks adult help using sounds, gestures, or some words when feeling strong emotions, either positive or negative **S5.8** Anticipates and actively avoids or ignores situations that cause discomfort	**S5.11** Uses a wide variety of self-comforting behaviors **S5.12** Communicates specific needs, wants, and discomfort to adults **S5.13** Anticipates the need for comfort and tries to prepare self for changes in routine	**S5.16** Consistently calms self when feeling strong emotions or discomfort with only occasional adult guidance and assistance **S5.17** Independently expresses feelings, needs, opinions, and desires in appropriate ways **S5.18** Follows expectations established to manage feelings and behaviors with necessary reminders or assistance	**5.21** Increasingly expresses feelings, needs, opinions and desires verbally **5.22** Shows increasing understanding of changing expectations for behavior and emotional expression in different settings (e.g., home, school, grocery store)
		S5.9 Follows simple routines, expectations, and boundaries to help manage own emotions and behavior **S5.10** Tolerates brief delays in getting needs met	**S5.14** Follows simple expectations to manage emotions and behaviors, but may require reminders or assistance, particularly during more intense feelings or circumstances **S5.15** Waits briefly to obtain something desired	**S5.19** Demonstrates the ability to delay gratification for longer periods of time **S5.20** Demonstrates understanding of rules, roles, jobs, and relationships in families and the community	**5.23** Shows increasing ability to manage challenging feelings and behaviors, with necessary reminders or assistance **5.24** Shows increasing ability to stop and think before acting

Social Understandings and Relationships Component of SEL

Subcomponent	0-1 year	1-2 years	2-3 years	3-4 years	4-5 years, K Readiness
S6 Social responsiveness: Child notices and responds to others and their emotions	**S6.1** Shows interest or reacts to others' emotions **S6.2** Responds to others' emotional tone and actions	**S6.3** Imitates others' emotions and expressions **S6.4** Shows some individual response to others' emotional tone	**S6.5** Identifies others' basic emotional cues **S6.6** Shows concern for others through efforts to help or comfort	**S6.7** Shows understanding, empathy, and compassion for others through words or gestures **S6.8** Labels others' emotions	**S6.9** Appropriately labels increasingly complex emotions in others (e.g., pride, embarrassment, jealousy) **S6.10** Responds appropriately to others' emotions **S6.11** Shows increasing understanding and appreciation of the perspectives of peers
S7 Building relationships: Child establishes and sustains relationships with others	**S7.1** Shows a preference for a trusted adult **S7.2** Notices or responds to others	**S7.3** Shows preferences for one or more adults or children **S7.4** Shows some awareness or caution with unfamiliar adults **S7.5** Uses trusted adult(s) as a base from which to explore	**S7.6** Seeks out familiar adults and children for conversation and play **S7.7** Manages routine separations with decreasing amount of distress	**S7.8** Shares information and participates in activities with adults and peers	**S7.9** Builds friendships through play, learning activities and conversation with peers **S7.10** Uses trusted adults for support in diverse settings (e.g., classroom, outside) when in need of assistance.
S8 Social skills: Child responds to and interact with others in a meaningful way	**S8.1** Notices others and chooses similar materials or copies actions	**S8.2** Play with others in a parallel manner **S8.3** Recognizes similarities and differences between self and others	**S8.4** Enters play groups using various strategies **S8.5** Seeks a preferred playmate **S8.6** Shows flexibility in roles during play	**S8.7** Initiates, joins, and sustains cooperative play and conversations with others **S8.8** Shows concern, respect, care, and appreciation for others and the environment **S8.9** Actively helps solve problems with others **S8.10** Takes turns	**S8.11** Shows increasing ability to initiate and engage in positive interactions with peers and adults **S8.12** Solves problems with others most of the time, appropriately using support of adults and peers as needed

APPENDIX B: EM-QUE Instrument

Rieffe, C., Ketelaar, L., & Wiefferink, C.H. (2010). Assessing empathy in young children: Construction and validation of an empathy questionnaire (EmQue). *Personality and Individual Differences, 49,* 362–367.

The EmQue consists of 20 items representing three facets of empathy that should be observable in young children: (a) Emotion Contagion, (b) Attention to Others' Feelings, and (c) Prosocial Actions. Parents can rate the degree to which each item, reflecting a type of behavior, applied to their child over the past two months on a 3-point scale (0 = never, 1 = sometimes, 2 = often).

Emotion Contagion

1   When another child cries, my child gets upset too

4   My child also needs to be comforted when another child is in pain

7   When another child makes a bad fall, shortly after my child pretends to fall too

10   When another child is upset, my child needs to be comforted too

13   When another child gets frightened, my child freezes or starts to cry

16   When other children argue, my child gets upset

19   When another child cries, my child looks away

Attention to Others' Feelings

3   When my child sees other children laughing, he/she starts laughing too

6   When an adult gets angry with another child, my child watches attentively

9   My child looks up when another child laughs

12   When adults laugh, my child tries to get near them

15   My child looks up when another child cries

18   When another child is angry, my child stops his own play to watch

20   When other children quarrel, my child wants to see what is going on

Prosocial Actions

2   When I make clear that I want some peace and quiet, my child tries not to bother me

5   When another child starts to cry, my child tries to comfort him/her

8   When another child gets upset, my child tries to cheer him/her up

11   When I make clear that I want to do something by myself, my child leaves me alone for a while

14   When two children are quarrelling, my child tries to stop them

17   When another child gets frightened, my child tries to help him/her

APPENDIX C: Southampton Test of Empathy for Preschoolers

Measure	Southampton Test of Empathy for Preschoolers (STEP)
Constructs	Social Awareness, Relationship Skills
Age range	Preschool
Rating type	Self-rating, performance-based
Description of measure as related to construct of interest	In STEP, the role of affective and cognitive perspective taking in empathy is considered. Assesses a child's ability to understand and share in the experience of another person across a number of hierarchically organized, emotion judgment contexts linked to facial expression, situational cues, verbal cues, and desires. STEP incorporates computer–presented, videotaped vignettes of children in emotional scenarios that focus on four emotional outcomes (angry, happy sad, fearful). It asks children to indicate their reactions to vignettes by selecting a picture of the relevant facial expression. The test incorporated 8 video vignettes of children in emotional scenarios, assessing a child's ability to understand (STEP-UND) and share (STEP-SHA) in the emotional experience of a story protagonist. Each vignette included 4 emotions (angry, happy, fearful, sad) that reflected emotion judgments based on the protagonist's facial expression, situation, verbal cues, and desire. The test incorporates eight video vignettes of children in emotionally evocative scenarios to assess a child's ability to understand (STEP-UND) and share (STEP-SHA) in the emotional experience of a story protagonist. Each child watched one practice story and eight test stories. The videos used continuous movement and child actors. Four stories had a male protagonist, and four had a female protagonist. Each story was made up of seven consecutive parts. In Parts 1, 2, 4, and 6 children were asked to judge how the protagonist (STEP-UND) and they themselves (STEP-SHA) would feel, on the basis of the protagonist's facial expression, a situation cue, a verbal cue, and the protagonist's desire. Each story part related to one of four emotional outcomes (angry, happy, sad and fearful), such that emotion judgments (related to facial expression, situation cues, verbal cues, and desire) were linked twice with each outcome. Desires were represented by a thought bubble (Wellman, Hollander, & Schult, 1996). Two further story parts (3 and 5) contained check questions that were designed to assess concentration and understanding. The story ending made up the final part (see Table 1). Each story was accompanied by an 85–90 word narrative and lasted approximately 120 s. Children indicated their emotion judgments by

	clicking on one of five schematic emotion faces (happy, sad, angry, fearful, OK/neutral) displayed at the bottom of the computer screen. After children watched the practice story, a computer screen appeared, featuring the eight story protagonists waving. Children had to click on successive characters in order to hear each story, and stickers were given between stories. This process was repeated until children had completed all eight vignettes, and a goodbye screen was presented.
Administration	Video vignettes and computerized responses
Scoring	The program generated two scores that represented the children's ability to identify the protagonists' emotions (STEP-UND; score 0, 1 or 2) and the children's tendency to share in these emotional experiences (STEP-SHA; score 0, 1 or 2). A score of 2 represented an accurate judgment of a protagonist's emotion (STEP-UND) or a match between the character's emotion and the child's judgment of his or her own emotion (STEP-SHA). A score of 1 was given for sad, angry, and fearful judgments when children responded with any other negative emotion. Zero represented an inaccurate judgment of a character's emotion or no match between the character's emotion and a child's judgment of his or her own emotion. Both STEP-UND and STEP-SHA had a minimum score of 0 (not empathic) and a maximum score of 64 (highly empathic; 8 stories, each with 4 emotion judgments).
Reliability	The results showed good internal consistency; Cronbach's alpha reliability coefficients for STEP-UND and STEP-SHA were .70 and .86, respectively. They also highlighted moderate concurrent validity with parent-rated empathy, a measure of facial indices, and construct validity with teacher-rated prosocial behavior.
Validity	Considering concurrent validity, children's ability to understand the perspective of others (STEP-UND) and to respond to them appropriately (STEP-SHA) was positively associated with parent report dispositional empathy.
Strengths	Links with parent-report empathy and facial responding support the proposition that STEP taps empathic responsiveness in preschool children.
Weaknesses	The small sample size and homogeneity of the sample characteristics limits the generalization of these findings. Concurrent validity was only moderate with existing measures of empathy, highlighting the difficulty in developing a valid and reliable instrument to measure emotional responsiveness in this age group. Furthermore, the absence of test–retest reliability limits our understanding of the stability of emotional perspective taking and empathy in this age group.
Publisher/Price	Public domain

Howe, A., Pit-ten Cate, I. M., Brown, A. & Hadwin, J. A. (2008). Empathy in preschool children: The development of the Southampton Test of Empathy for Preschoolers (STEP). *Psychological Assessment 20*, 305–

Appendix D: Environmental Identity Development

Taken directly from Green's theory of EID:

Environmental Identity Development (EID) (Green, Kalvaitis, & Worster, 2016; Green, 2018) stems from linking understanding of child development to environmental education. The theory extends the first four stages of Erikson's (1980) framework. Children progress through a series of psychosocial dilemmas (stages) in the development of their environmental identity. Progression through each stage is determined by a child's success in overcoming outer (environmental) and inner (emotional) conflicts attributed to healthy development. In the first stage, Trust in Nature vs. Mistrust in Nature, feelings of trust and security are considered foundational to a child's environmental identity development. Mistrust in nature would emerge from fearful and anxious encounters with nature that are not adequately negotiated. In the second progression, Spatial Autonomy vs. Environmental Shame, a strong sense of trust in nature propels a child to venture out, independently or with others, to explore and claim their own places. The development of a sense of place allows a child to gain a sense of autonomy with their environment (Green, 2011; 2015). Contrary to spatial autonomy are feelings of environmental shame, which causes a child to withdraw and feel uncomfortable during nature experiences. In the third progression, Environmental Competency vs. Environmental Disdain, children gain confidence in their interactions with nature by acquiring skills and ecological understandings of place (Green, 2013). Feelings of guilt, or a lack of confidence and ecological understanding lead children to demonstrate environmental disdain, or a disregard for nature. In the fourth progression, Environmental Action vs. Environmental Harm, through successful progression in the previous stages, children develop moral values and the know-how to engage in Environmental Action. Failure to progress through one or more stages would result in intentional or unintentional environmental harm. The progression of Environmental Identity Development is fluid meaning that the various progressions are frequently revisited, refined, and/or reestablished with new encounters and experiences in, with, and for nature throughout one's life. Sociocultural, geographical, and educational contexts influence the way in which a child's environmental identity is formed. The proposed project will strengthen understanding of the emotional and behavioral attributes of children's environmental identity development and how sociocultural, geographical, and educational contexts influence children's nature relationship.

Appendix E: Children's Affinity for Nature Assessment

Rice, Camilla and Julia C. Torquati (2013). "Assessing Connections between Young Children's Affinity for Nature and Their Experiences in Natural Outdoor Settings in Preschools." *Children, Youth and Environments 23*(2): 78-102

From the article: The interview items (below) were presented to children for role-play using hand-held puppets. Previous research using puppets, pictures, and games with preschool and elementary-aged children has demonstrated good reliability and validity (e.g., Denham 2006; Eder 1990; Evans et al. 2007; Musser and Malkus 1994). We presented each participating child with two identical puppets, one with a "biophilic" attitude toward nature and one with a "non-biophilic" attitude toward nature. The same gender-neutral puppets were used for boys and girls (each was yellow with a smiley face) but the sex of the puppet as described in the story was matched to the sex of the participating child. For example, "This boy/girl likes to watch animals like squirrels and rabbits (biophilic) and this boy/girl thinks it's boring to watch animals (non-biophilic)." Next, the child was asked, "Which one is more like you?" Children were interviewed in a quiet area of their preschool that was separate from the classroom. The puppet interviews took approximately ten minutes and were audio recorded and transcribed.

Biophilic Item	Non-Biophilic item
This boy* likes to play outside.	This boy likes to play inside.
This boy likes to dig for worms.	This boy doesn't like worms.
This boy likes to splash in puddles.	This boy doesn't like to get wet and muddy.
This boy likes to watch birds.	This boy doesn't like to watch birds.
This boy likes to catch bugs and look at them.	This boy likes to stomp on bugs and kill them.
This boy likes to watch animals like squirrels and rabbits.	This boy thinks it's boring to watch animals.
This boy likes to play in creeks and lakes.	This boy doesn't like to get wet and dirty.
This boy likes to play with sticks, leaves, and pinecones.	This boy thinks sticks, leaves, and pinecones are dirty.
This boy likes to listen to birds singing.	This boy thinks it's boring to listen to birds singing.
This boy likes to look at the stars and moon at night.	This boy would rather play indoors at night.
This boy likes to learn about wild animals.	This boy isn't interested in wild animals.

Appendix F: Other Instruments for Assessing Connection to Nature and Similar Constructs in Young Children

From Chawla and Beery (2020):

Article	Construct name and dimensions	Measurement approach	Sample
Elliot et. al. (2014)	Ecological awareness: • nature relatedness • environmentally responsible behavior	1. Child interview via board game: • 4 items on nature v. non-nature activity preferences • 6 items on environmental behaviors 2. Ethnographic observation of children's behavior in nature	43 kindergarten children in Vancouver Island, British Columbia: • 21 in nature kindergarten • 22 in conventional kindergarten
Giusti et. al. (2014)	Affinity with the biosphere: • emotional affinity • cognitive affinity • attitudinal affinity	Child interview via image-based board game: • 14 items for emotional affinity • 21 items for cognitive affinity • 6 items for attitudinal affinity	27 five-year-old children in preschools in Stockholm: • 11 children with nature-rich routines • 16 children with nature-deficit routines
Rice & Torquati (2013)	Biophilia: • preference for being outdoors • enjoyment of sensorial aspects of nature • curiosity about nature • interacting with nature	11-item interview using puppets: • one puppet represents the "more biophilic" child • the other puppet represents the "less biophilic" child • the participating child is asked, "which one is more like you?"	114 children in 10 early childhood programs equally distributed between Nebraska and California: • 6 programs had an outdoor play space with natural elements • 4 programs did not have outdoor play space with natural elements
Sobko et. al. (2018)	Connectedness to Nature Index-Parents as Proxy for Preschool Children: • enjoyment of nature • empathy for nature • responsibility toward nature • awareness of nature	Two studies conducted: • Study 1: Piloting and adapting a 20-item index for parents to fill out for their preschool children • Study 2: Large scale evaluation of the new tool and testing its convergent validity	Two studies conducted: • Study 1: Randomly chosen parents of 31 two- to four-year-old children (mean age = 2.16).* Families lived in apartment buildings without front or back yards, as is typical in Hong Kong • Study 2: 299 families with two- to five-year-old children *ages verified by T. Sobko, personal communication