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Social and Emotional Learning in the age of virtual play: technology, empathy, and learning

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Abstract

Purpose – Empathy is part of what makes us human and humane, and it has become a core component of the Social Awareness competency of Social and Emotional Learning (SEL) (CASEL, 2019). SEL fosters the understanding of others' emotions, is the basis of Theory of Mind skills and frames the development of empathy. The purpose of this paper is to trace the links between empathy development and social and emotional learning when using real versus virtual environments. Empathy is a uniquely human emotion facilitated by abstract thinking and language. Virtual play is a teaching tool for acquiring prosocial behaviors. And finally, human-mediated (traditional and virtual) play is most favorable for SEL growth. Recognition of emotions such as empathy and other socio-communication skills have been taught to children with Autism Spectrum Disorders (ASD). Therefore, technology can be a venue for acquiring empathy.
Design/methodology/approach – This paper uses a qualitative interpretive methodology to advocate for the use of technology with human mediation to teach Social and Emotional Learning skills, based on the premise that cognitive and social-emotional development occurs synergistically and mediated by speech and interaction with the environment.
Findings – Technology is best seen as an instrument of assessing and teaching socio-emotional skills, but not as the only means to an end, because what makes us human can only be taught within an ecology of human interaction in real-life situations.
Originality/value – This paper reviews previous research works (both empirical and theoretical) that bring to light the connection between socio-emotional development, specifically empathy development, and virtual environments.

Keywords Social and Emotional Learning (SEL), Empathy, Play, Autism, Virtual reality

Paper type Conceptual paper

Starting from the Vygotskian premise that "learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with peers" (Vygotsky, 1978, p. 90), and keeping in mind that virtual reality (VR) did not exist at the turn of the twentieth century when Lev Semionovich Vygotsky lived (1896–1934), this paper investigates what types of interactions are more conducive to true socio-emotional learning ("with people in his environment"/in person, vs online) and to what degree each should be used advantageously.

Technology is pervasive today in youths' lives during their most important years of maturing of their prefrontal cortex, a brain region responsible for moral judgment, moral decision-making, information integration, causal reasoning, empathy and complex executive functions (e.g. Dvash and Shamay-Tsoory, 2014; Lamm *et al.*, 2011; Patil *et al.*, 2017). In the most recent US Census (2015), over 94 percent of American households with at least one child (under 18 years old) and

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almost 95 percent of households with a 15–34 year old had access to a computer (United States Census Bureau, 2017). Some 58 percent of teens (13–17 years old) own or have access to a tablet computer, and 81 percent of teens (of which 91 percent boys and 70 percent of girls) own or have access to a game console (such as Playstation, Xbox or Wii) (Pew Research Center, 2015). Today, 70 percent of Americans use social media to connect, keep informed, share about themselves and entertain themselves (including playing games) (Lenhart *et al.*, 2010; Pew Research Center, 2019).

In the following pages, this paper uses interpretive methodology to discuss the emergence of Social and Emotional Learning (SEL) during play and virtual play, and the impact of gaming on these psychological processes in typical and atypical development (specifically, autism spectrum disorders-ASD). Empathy, included as a component of social awareness in the framework for SEL, is the ability to connect with others on an emotional level, and is recognized as an essential component of being "human." In the last sections, this paper advocates for human mediation, when using technology for an optimal expansion of SEL.

Play in traditional settings

The main source of interaction with the environment for a child is during play. Play can happen anytime and everywhere. Cooperative peer play compels children to take the other's perspective, being a potential catalyst for empathy development (Brownell *et al.*, 2002). Rough and tumble (R&T) play, object play, and social and pretend play are several of the categories used to describe traditional formats of children's play activities, each with its own features and aims. In R&T play, children often mimic the competitiveness of adult sports or tournaments as they use the playground as an arena for play fighting and other social dominance maneuvers (e.g. King of the Hill). Within this context, close observation can help differentiate the posturing of real aggression from the more exaggerated movements of play fighting (Fry, 2005). Thus, on preschool and elementary playgrounds, children can learn and polish the stances, gestures and other social mannerisms that will serve them well as leaders on the athletic fields in adolescence and, even, in the boardrooms of adulthood.

Likewise, Smith (2005) notes that children's playful negotiations, whether in fantasy play or pretend war, extend children's perspective-taking skills, an important component of empathy and prosocial behavior. Moreover, imaginary play facilitates a Theory-of-Mind (TOM) framework (i.e. perspective-taking skills, localized in the prefrontal cortex, as noted in, for example, Happe *et al.*, 1996). During imaginative play, children must learn to anticipate and relate to others' beliefs and intentions to build successful dialogues while role playing. Drawing on social learning theory, authors Bretherton (1989) and Maccoby and Jacklin (1974) highlight the impact of adult models on children's role-taking in play, particularly in selecting play objects associated with same-gender models (e.g. trucks for boys vs dolls for girls).

Object play is a distinct – and complex – category of play considered to encompass not just play centered on objects but also constructive play and tool play which serve slightly different purposes (Pellegrini and Gustafson, 2005). Whereas the basis of object play is to explore potential answers to the question: What can I do with this object?, constructive play focuses on achieving a particular goal in building or creation and tool play focuses on using the object in a constructive manner. In the sense that play is typically considered a voluntary activity of free exploration without a particular objective, constructive play and tool play seem to rest on the borderline between actual play and learning/work. Moreover, despite general linkages between object play and developmental stages, constructive play does not reflect the inverted-U developmental curve that characterizes other forms of play (meaning that the peak is in early childhood with minimal involvement in infancy or later childhood/adolescence).

Play in virtual settings

Although virtual worlds are a relatively new phenomenon, their roles in facilitating learning through play, imagination and representative experiences are essentially a progression

upon an established theme. Children are consumed in a variety of concrete, real world "props" in their attempts to access and manipulate abstract concepts within their play. Within the context of video games and virtual worlds, however, children explore representational experiences within an established framework rather than operating solely within the context of imagination. There are rules to these virtual worlds for the children to learn and follow to maximize potential rewards. There are new environments and new experiences to seek out and explore. There are problem-solving strategies to develop and implement. Whether children are spending time seated in a cardboard box or sitting in front of a laptop computer, the processes share many similarities (Klug and Schell, 2006).

Virtual worlds' increasing popularity among young children as young as two years old has the potential to greatly change the future nature of children's play behaviors. Van Camp (2011) cites an NPD (National Purchase Diary Panel and NPD Research) study claiming that 91 percent of 2–17-aged children play video games in 2009, with a follow-up 2011 study asserting that gaming among 2–5 year old children has increased the most. Technology is ubiquitous for the youngest generation, and children now learn to use a mouse and interact with computer screens not too long after learning to walk. While the multimodal experiences of animated characters, audio-visual storybooks, kinesthetic response systems, customizable avatars, and rich 2-D and 3-D graphical environments engage multiple senses synergistically (Yelland, 2010), the limitation is that the nature of interaction is far different from face-to-face environments. The question at hand is whether this change will benefit or impede children's socio-emotional development.

Yelland (2010) notes that the exploratory context of young children's social media platforms, with their tools for creating characters, "somewhat turns Piaget's ideas about egocentricity on their head" (p. 18). Subrahmanyam and Smahel (2011) posit that offline and online worlds are interconnected, noting that children may interact in some virtual environments with offline friends and in other virtual environments with strangers. Further, they note that digitally-mediated friendships are changing the nature of friendships, in general, and how youth interact with each other, in particular. Finally, they raise a question as to whether digital friendships offer the same level of support (as a buffer against stress and isolation) as traditional in-person friendships. This is certainly a question with implications for children's social development as are questions of the true nature of online relationships (e.g. perspective-taking, reciprocity, gender groupings, etc.) and how to promote prosocial behaviors.

Role of play in children's social development

Bateson (2005) conceptualizes children's play as a serious and active endeavor which acts as "developmental scaffolding [which, when its] job is done, […] largely falls away" (p. 16) because adults often lack the time or interest for play, and no longer need to engage in play as a skill-building activity. Further, in situating play within an evolutionary context in which play is seen as an adaptive behavior across species (Staddon, 1983), Bateson generally regards play as a means of building and refining skills in the physical, social, and cognitive (especially problem-solving) domains with the added benefit of offering a "relatively safe context" to experiment with "potentially dangerous situations" and "learn from […] mistakes, but safely" (p. 17). As situations (either biological, social or otherwise) change, Bateson contends that various species modify their play behaviors appropriately in new situations, forging new paths of development based on responses to situations. Although Bateson refers primarily to animal species in terms of how operators transform their environments, the current trend toward virtual play spaces is one example of how humans have translated and modified play behaviors to fit the ubiquity of technology in children's lives. Since this is a newly developing arena, the repercussions of virtual playgrounds for young children are, as of yet, largely untested and speculative with long-term developmental effects yet to be determined.

Traditional views of play shed light on the functions and processes of play, even within a virtual environment. Vygotsky (1978) notes that when trying to problem-solve (a phenomenon habitually occurring during play, including virtual play), children use language to (or attempt to) solve the task and to enlist the help of an available person for assistance. Further, Vygotsky states that play marks the separation between "meaning and what is seen" (p. 97), driving children to separate thought from action. For Vygotsky, imagination, fantasy and symbolic play liberate a child from the constraints of objects, experience and the immediate perceptual field, creating a "zone of proximal development" in which a "child always behaves beyond his average age, above his daily behavior […] as though he were a head taller than himself" (p. 102). In the context of video games, virtual worlds and "virtual play," Vygotsky would likely argue that the child is exploring complex roles, rules, concepts regarding identity, problem solving and social interaction.

Typically, children in the preschool years begin to make this transition, entering into activities that encourage them to use objects in novel, unintended ways (e.g. pretending that a blanket over two chairs is a house, or using a paper towel holder as a microphone). Meaning is preeminent (and trumps action) in the context of preschool play, propelling children toward optimal arousal in the zone of proximal development. This developmental progression is scaffolded as needed by adults who may offer direction, support, and resources. However, since one of the fundamental purposes of play is to allow children the space to test out their abilities for self-regulation and self-control, is it important that play be performed in environments that, though monitored (for safety, etc.) are not prescribed, nor pre-scripted. Partially, the purpose of children's play worlds is to develop their own elaborate scripts for interaction, social, cognitive and physical skill building, and to practice operating within the flexible rules of this self-created world. Accordingly, the features of virtual play environments for their youngest users need to be paradoxically structured (to provide an appropriate framework, e.g. limited options for avatars and conversational exchanges so as not to overwhelm young children's limited skills) and tractable (to grow with children as they gain new skills and seek to explore the environment in new ways).

Then, as children's skills develop and they move more towards abstract thought, the challenge shifts to sustaining the flexibility that is found in preschoolers' play amidst the athletic and competitive activities of middle childhood that are, necessarily, characterized by rules. In particular, scaffolding of prosocial behavior is a distinct need as bullying (and cyberbullying) incidents peak in middle childhood and early adolescence. While virtual worlds like Club Penguin Online filter conversations and block standard insults, creative users can find ways around these limitations. Ostracism and isolation are still possibilities, even within carefully monitored virtual worlds, and initial research by Williams and Nida (2009) as well as others suggests that ostracism, in general, is linked to a variety of psychopathologies (e.g. aggressive conduct, anxiety, depression).

Mussen and Eisenberg (2001) point to the importance of both parental guidance in the form of inductions and exemplary models as key elements in shaping children's development of prosocial behaviors. While many virtual worlds for children require direct parental approval (i.e. parents must set up accounts for children under 13), children with strong literacy abilities can circumvent some of these safeguards by lying about their age. Additionally, even with parental approval of the child's account, rarely is there direct parental supervision throughout the children's online interactions. While adult monitors on a traditional playground will miss many of the subcurrents of aggressive dynamics, in a virtual space, where there is only an invisible filter as an omnipresent monitor, children quickly learn (and teach each other) ways of tricking the interface, potentially feeling even more bold given the seeming lack of adult presence.

The play landscape has been shifting steadily to include more virtual play opportunities, even for young children. As urban environments (in particular) struggle to provide safe and

attractive play spaces and schools cut recess time and limit free play due to budgetary constraints and accountability measures (Bergen and Fromberg, 2005), children are spending more time not just in video game play (including active play with PS4 and Nintendo 360 systems) but also in one of more than 100 (Bers *et al.*, 2010) virtual worlds or social networking platforms targeted toward children, from the classic well-known Webkinz World, Club Penguin Online and ScratchJr to temporary virtual playgrounds like Tufts University's grant-funded ClubZora to the newer Minecraft and its many mods (and a range of options in between).

These virtual environments vary drastically in their frameworks and features. ScratchJr, based on constructivist learning principles (Bers *et al.*, 2010), offers a completely blank slate for the young user to construct their own objects for identity exploration, emphasizing meaning over esthetics. Webkinz World, at the other end of the continuum, represents a commercialized approach to play that promotes proprietary currency and appealing, though prescriptive, options for designing the pet's environment and interacting with the virtual pet (Siibak and Ugur, 2010). A significant challenge of virtual environments is how, or even if, they replicate and extend these traditional types of play (i.e. R&T, pretend and fantasy, object play) or if they create an entirely new format. While elements of each can be seen in, respectively, motion-sensitive gaming consoles (with play distributed over an internet connection), creation of characters and settings (e.g. avatar development, virtual construction projects), and creation and manipulation of virtual objects (through various software interfaces that promote invention and innovation), including augmented reality toys, the sensory and perceptual exchanges – not to mention the social exchanges – are markedly different in a virtual environs than in a face-to-face setting. As these virtual environments continue to grow in popularity and as researchers conceive of ways to navigate the practical challenges of collecting data in virtual settings, there is a significant opportunity to better understand how virtual settings interact with traditional play settings to prepare children for their social, physical and cognitive roles in real life.

Empathy development

Internet technologies are still young. What is not clear at this juncture is whether children who are raised interacting regularly in virtual worlds will develop empathy in a different manner than other generations. Empathy is a component of self-awareness, a core competency in SEL (CASEL, 2019). Empathy development, from arousal to internalization, is a complex process that begins in early infancy. Empathy describes an individual's "ability to understand and feel the other" (Dvash and Shamay-Tsoory, 2014, p. 282). Ayala (2010) notes that empathy plays an important role in the development of morals, which is an attribute reserved for human nature (morality is used here as a synonym for ethics). Morality, Ayala defines it, represents "actions of a person who takes into account in a sympathetic way the impact the actions have on others" (p. 9015), and is guided by moral codes, which are the result of cultural evolution, again, specific to human nature.

As children grow, observe the world, and learn from interactions with others, caregivers play a critical role in helping children make the leap from noticing others' distress to internalizing a sense of morality that prompts them to feel guilt when they have wronged others. Empathy development places significant cognitive demands, though, so children do not fully develop their perspective-taking abilities until they have the ability to think abstractly (around age 12). In fact, empathy expands on the TOM abilities (understanding other's mental states, or "mentalizing"; Frith, 1999), encompassing the emotional aspect of others' experiences (Dvash and Shamay-Tsoory, 2014). Dvash and Shamay-Tsoory (2014) conclude that "empathy is the link between knowing the thoughts and feelings of others, experiencing them, and responding to others in caring, supportive ways" (p. 282).

In deconstructing cognitive and noncognitive involvement in TOM skills, Tager-Flusberg postulates that TOM abilities "encompass emotional and perceptual processing that serve as the

foundation for social recognition" (p. 313). More specifically, TOM pertains to understanding self and others' mental states and is at the root of empathy (Dvash and Shamay-Tsoory, 2014). Consequently, abstract thinking opens the doors to true empathy (via perspective-taking) as well as the opportunity to utilize empathy in abstract realms such as hypothetical scenarios and virtual domains (such as gaming).

Following a parallel vein, Vygotsky (1978) links cognitive development to becoming human via speech: "the most significant moment in the course of intellectual development, which gives birth to the purely human forms of practical and abstract intelligence, occurs when speech and practical activity, two previously completely independent lines of development, converge" (p. 24). Vygotsky explains that, at first, children's egocentric (toward the self) speech follows the action. Then, speech accompanies the action, describing it, and, finally, speech precedes the action, helping to plan it. Planning and self-regulation abilities are tightly related to the development of executive functions (Elliott, 2003) seated in the prefrontal cortex. Further, Vygotsky (1978) posits that, by using language as a problem-solving tool, children learn to master not only their environment, but also their own behavior. The amount of speech used increases as the difficulty of the task at hand increases. Therefore, "the history of the process of internalization of social speech is also the history of the socialization of children's practical intellect" (p. 27). Interestingly, Shin (2018) reached Vygotsky's conclusion via a quasi-experimental design, where the researcher tested the impact of immersive storytelling via VR. The findings "suggest that the cognitive processes by which users experience quality, presence, and flow determine how they will empathize with and embody VR stories," in other words, "rather than simply being influenced by technological features, users have intentional and purposeful control over VR stories" (p. 64). Therefore, social-emotional development cannot occur without the development of cognitive skills. This paper next investigates how technology was used in children with ASD to teach SEL skills, and discusses the impact of virtual networking (via social networks or gaming) and culture on SEL development.

Virtual play and empathy in atypical development

In typical empathy development, infants progress from a combined sense of the self and other, with the ability to react to the others' distress, all the way through cognitive and emotional development of an adolescent/adult perspective of the individuated self and other with concern and consideration for the other. In children diagnosed with ASD, significant deficits in social reciprocity and communication skills occur. Because this diagnosis represents an example of an atypical SEL style, we will discuss representative results of the most recent research on technology used to teach social-emotional skills to people with ASD. Tager-Flusberg (2007) notes that:

> […] studies of children with autism suggest that such children treat theory-of-mind tasks as logical-reasoning problems, relying primarily on language and other nonsocial cognitive processes in lieu of social insight.
>
> Children with autism generally have executive-function deficits that require planning, flexibility, or working memory combined with inhibitory control. […] Language ability has been closely linked to the development of theory-of-mind skills. (p. 312)

For example, in refining the study of TOM differences between neurotypical and participants with ASD, Moran *et al.* (2011) found significant results regarding TOM moral judgments. While the neurotypical group evaluated accidental harms less morally wrong than attempted harms, the ASD group did not differentiate between accidental and intended harms, suggesting impairments in integrating information about the other's mental state (in this case, premeditation to harm vs accidental harm), resulting in impaired moral judgment.

Previous research results show that children with ASD are more responsive to technology than to usual human interaction (e.g. Good *et al.*, 2016; Parsons and Mitchell, 2002; Scassellati *et al.*, 2012). People with ASD are more attuned to the mechanics of mouth movement rather than mouth-eyes feedback processing, according to two literature reviews (Falck-Ytter and von Hofsten, 2011; Guillon *et al.*, 2014), where results confirm this theory for teenagers and adults but are mixed for younger children; and according to a more recent piece of research that shows that children with autism focus on mouth movements during emotional conversations (Hutchins and Brien, 2016). These findings suggest that people with autism may be less concerned with the larger perspective of how things work together and their combined effects when assembling social-communication messages. As such, the body of research on the effects of technology on the learning of children with autism has grown exponentially in the past couple of decades. The following selected examples from the literature show that researchers are testing improved ways to teach social skills to children with autism.

Boyd *et al.* (2015) evaluated the effect of collaborative iPad games (specifically, Zody and Lego play sets) on membership, partnership and friendship of children diagnosed with ASD. A single-subject ABAB design of four dyads revealed that cooperative virtual gaming can promote developing social skills at various levels of intimacy between players in a dyad. These results are stimulated by three main elements: "joining in" variables that support membership; "coordinating actions" assisting partnership; and "commenting on the shared experience" that enables friendship (Boyd *et al.*, 2015, p. 16). Even if gaming on tablets does not require human mediation, the partner of the dyad is inherently human, therefore, the relationship connection occurred on a common ground.

When investigating how Minecraft impacts social skills in neurodiverse youth (including ASD), Zolyomi and Schmaltz (2017) found that virtual games provide opportunities for youth to: use it as a model for real life imaginative play; use the game avatars to connect with one another and to their therapists in real life; understand that behaving well in the virtual space will upgrade them to moderators and generalize this progression to the real environment; and express themselves further in the online medium (by making YouTube videos for other youth). The authors conclude that the virtual environment has the potential to scaffold social learning and they recommend that families and programs for neurodiverse youth embed mediated pro-social software platforms into their practices.

Bozgeyikli *et al.* (2018) used VR (vs verbal) instructions, and reached the conclusion that the following technology design practices work better for children with High Functioning Autism: "low visual fidelity and normal view zoom, and using no clutter and no motion in VR warehouse training applications" (p. 1). The group of researchers followed up with a systematic literature review synthesizing challenges in design and best practices in designing VR training for children with ASD (Bozgeyikli *et al.*, 2018).

In another literature review, Jaliaawala and Khan (2019) analyze 31 studies employing computer-based (computer aided systems, computer vision assisted technologies, VR and artificial intelligence) interventions used to teach 550 children with ASD facial expressions. They reach the conclusion that research is far from developing a comprehensive technology-based intervention with a clinical impact on autism because of inconsistency in research methods used, although these interventions show much promise.

The fact that technology has been shown to be effective in teaching social skills to people with ASD, with the caveat that the generalization of trained behaviors is slow to occur, compels us to agree with Parsons and Mitchell (2002) that VR has the potential to teach social behaviors to children (with ASD) offering role-playing opportunities to practice social conventions. The role of technology is limited, though, as "technology *per se* cannot provide solutions to key issues in the field" (Good *et al.*, 2016, p. 211). Nevertheless, by identifying effective aspects of "new technologies and the *interactions* that take place with and around

them" (Good *et al.*, 2016, p. 211), research can advance technology as part of a treatment procedure for person-to-person interactions, but not replace the human element in the process of education.

Therefore, technology can be used as a tool for SEL growth, but with necessary human mediation, based on rigorous previous research (i.e. showing effectiveness). The quality of the interaction with technology is one of the elements that researchers can control to set the stage for the quality of Social and Emotional Learning. It is interesting to note that the best-practice technology guidelines are increasingly mimicking human interaction due to the uniqueness of human connection.

Face-to-face vs virtual networking

Online networking (with its main characteristic: interaction) and other mobile and internet networking applications afford both advantages and disadvantages for human connection. Use of such applications does not necessarily impede empathy since, as Hoffman (2000) notes "empathy can thus be aroused when observers imagine victims: when they read about others' misfortunes, when they discuss or argue about economic or political issues, or even when they make Kohlbergian judgments about hypothetical moral dilemmas" (p. 91). Following this idea, users on a social networking platform such as Facebook can join each other's social causes by linking to the cause and other supporters as well as by donating funds. Social networking followers can generate momentum for an issue or need by sharing articles and information and generating word of mouth buzz in support of an effort, much as people have raised awareness, donations and other types of assistance for people or geographical regions in distress. In this way, reading about the plight of imagined victims, even at a distance, can propel people into action, presumably by arousing empathy for the victims. By extension, when playing games, certain empathic aspects can be turned on or off, depending on the nature and purpose of the game (e.g. which team the player is on).

Computer-based methods, such as the Face Expertise Training and Let's Face It! (LFI!) software, have been shown effective in training face recognition skills in children with autism (Xu and Tanaka, 2014). Further, facial recognition platforms for mobile phones are developed to assist people with autism in understanding the emotions of the people around them (Cho *et al.*, 2009). Physicians and psychotherapists use internet technologies to meet with clients virtually, alleviating social anxiety and providing a platform for expression of the real self as well as creating online communities of support for various issues of health and well-being. In tertiary education, online programs are becoming more popular, including for programs that are preparing social and human services professionals with a desired profile of high empathic abilities, such as teachers, therapists and nurses.

Christakis and Fowler posit that proximity and face-to-face interactions are critical to the spread of emotions (2009) and would inherently affect the ability to develop empathy since reacting to and experiencing another's emotions are important components of empathy (Andreasson and Dimberg, 2008). On the other hand, Hancock *et al.* (2008) found that emotional contagion is also possible via computer mediated communication, when the participants in their study sensed their interlocutor's emotion and also became sad using only instant messaging communication. Logan's (2009) study also counters that technology is not the sole barrier to empathy development, but merely "tools and circumstances to set the stage." Logan also asserts that solegoism, a self-interest placed above else, is driven by commercialism and various factors of urban life to distance people from one another. Logan's notion of solegoism contrasts with the formal stages of empathy development, as described by Hoffman (i.e. egocentric empathic distress to quasi-egocentric empathic distress to veridical empathic distress) that delineate an evolving focus on the other's needs.

This dovetails with Lanier's (2010) ideas that internet technologies are stifling the essential nature of humans to create and grow and expand capacities by relegating data to the Cloud and eliminating the need for people to interact in such simple ways as describing their marital status in their own words. In limiting humanity in such a manner, Lanier proposes that internet technologies squelch real advances and dull real human connections.

It is clear that both sides of the social networking and empathy debate have credible arguments with examples to illustrate their points. There is increasing evidence through research and anecdotal experience that today's youth interact with technology differently than older generations, using social networking less to sustain face-to-face interactions and more to develop new interactions (Cole *et al.*, 2017) that may even prevent face-to-face involvement (e.g. online gaming which has been shown to be addictive). In typical empathy development, infants progress from a combined sense of self and other with the ability to react to the other's distress all the way through cognitive and emotional development to an adolescent/adult perspective of individuated self and other with concern for other. Some research points to the limits of computer simulation in stimulating mirror neurons (e.g. Dickerson *et al.*, 2017) and promoting facial expression recognition (*vis-à-vis* Facial Feedback Theory), so it is possible that children of the virtual era who are adept at connecting through Webkinz interfaces and other virtual worlds may have atrophied role-taking skills.

Culture, empathy and schools

Socialization processes help shape cultural expectations for youth, including what role technology will play in their everyday lives. In fact, people have an innate need to form networks with others. Christakis and Fowler (2009) contend that networks play a heavily influential role in how people think and act since ideas and practices spread across connections by what they term the Three Degrees of Influence Rule – meaning that your friend's friend's friend can have a significant impact on your health or financial behaviors by virtue of how people interact and influence each other. In that case, culture plays a role in shaping empathy today since social networking plays a central role in culture, both online and in person.

In fact, there is a unique opportunity through online networks to cultivate compassion, empathy and other valued constructs by providing good role models since Hoffman (2000) marks that "children imitate a model who does what they want to do and is not punished" (p. 127). Although this refers specifically to guilt development as a prosocial construct, it is applicable in online social networking because adults can be particularly conscious (and conscientious) about employing and influencing their social networks to respond empathically to each other's issues, to societal issues and disasters, and by taking advantage of such opportunities to help young technology users develop a moral compass.

Haim Ginott (1993), a child psychologist, shares in his book *Teacher and Child* a letter a school principal received from a Holocaust survivor and decided to send it to all the teachers in his school at the binning of the school year: "My request is: Help your children become human. Your efforts must never produce learned monsters or skilled psychopaths. Reading, writing, and arithmetic are important only if they serve to make our children more human" (p. 317). Many cultures believe that it takes a village to make a child human, so joint efforts to teach and shape children's moral perspective and empathic responses need to go beyond parents and schools. Parents can be charged with the task of supervising their children's online behaviors, not just to prevent unwanted interactions, but also to discuss online choices, rules and values in society vs VR, and shape effective interactions. Teachers, schools and other adults in youth's lives (from church youth directors to aunts/uncles) who are part of youth friend networks can use online tools to demonstrate care and concern, thus showcasing the principles of distributive

justice that Hoffman discusses. Although Hoffman discusses mimicry in empathy-arousal as a face-to-face process, it can also be said that online friends shape each other's actions to a great degree whether that is through joining groups, reposting wall messages of particular note, or commenting on each other's posts. Used intelligently, online social networking tools can be a medium of both empathic arousal and inductions, particularly when overlapping members of a single person's network use these tools for this purpose. Armed with the information about how today's youth approaches online technologies, older technology users can be aware of how to combat the proliferation of online victimization. Posting comments to photos, status messages or on friends' walls rank high among preferred social networking activities – and can be an ideal opportunity for older users to intervene and teach empathy and perspective-taking skills that will hopefully carry through into instant messaging and text messaging behaviors that are also popular with youth.

VR can be mesmerizing and can capture children's attention, time and energy. Christakis (2014) found that touch-screen technologies seem more likeable than passively watching a screen (TV) or than playing with blocks, as measured by cortisol levels in the saliva of 15–18 month olds. However, traditional toys (such as playing blocks) are the only ones that are three-dimensional, and it has been found (Christakis in a video recording as cited in Cooper, 2018) that children do not transfer the knowledge from learning to manipulate play blocks in 2D (a screen) to 3D (i.e. they would have to start learning all over again). This may also mean that being able to perform well in a virtual environment (including obtaining high scores during games or obtaining a high number of "Likes" or subscribers on social channels) does not necessarily equal a comparable success in real life, especially if the skills are not transferable. Similarly, it has been shown that actions possible in a game (real affordances) are not necessarily the same as the actions that players perceive as possible (perceived affordances) (Cardona-Rivera and Young, 2013). The discrepancy is much greater when the player moves from a virtual controlled environment, based on human-computer interaction, to a potentially unlimited realm of possibilities in reality, where other "players" (people) may make surprising decisions.

Based on these and similar findings, the American Academy of Pediatrics (2016) current guidelines for screen time use in children recommend to "avoid digital media use, except video chatting, in children younger than 18 to 24 months." This suggestion seems to be useful for older ages as well, as a study on 143 undergraduate students from the University of Pennsylvania reported decreased loneliness and depression, after three weeks of setting a limit to social media, compared to the control group (Hunt *et al.*, 2018). Notably, the exception above is for video chatting, which implies person-to-person interaction, reminding of Vygotsky's postulate that speech is the link between cognitive and social development.

Social associates tend to shape our ideas and practices, so it is imperative that society uses that influence for the good. In fact, there is a unique opportunity through online networks to cultivate compassion, empathy and other valued constructs by providing good role models since Hoffman (2000) posits that "children imitate a model who does what they want to do and is not punished" (p. 127). Although this refers specifically to guilt development as a prosocial construct, it is applicable in social networking (including via gaming) because adults can be particularly conscious (and conscientious) about employing and influencing their social networks to respond empathically to each other's issues, thereby modeling prosocial approaches to societal issues and disasters. For example, a parent who takes the time to sporadically check on their child's play activities within Club Penguin Online can point out fellow penguins that seem isolated, or discuss visible conversations that may be hurtful to other players and, thus, use virtual circumstances to help young technology users develop a moral compass.

Supporters of SEL advocate for schools to teach children how to build relationships rather than do well on tests (Smagorinsky and Downey, 2018), reversing the Every Student Succeeds Act, formerly No Child Left Behind legacy. However, schools can and should do both. School culture can take an active role in the social emotional training process by educating parents and other adults who interact with youth as well as by providing empathy training relevant to online settings. In the nebulous world of cyberbullying, school administrators are frequently at a loss as to how to deal with behaviors that do not occur on school grounds or during school hours but have a huge negative impact on students at school; in implementing intervention and anti-bullying programs that target such issues, school representatives have the opportunity to incorporate SEL training as a means of encouraging self-regulation and caring among students. Since cyberbullying is most relevant among middle school and high school youth who are, most likely, able to reason abstractly, empathy training can help students focus on taking another's perspective (in this case, that of the victim) to arouse empathic concern or empathic anger to intervene or report on bullies in the future.

To follow Hoffman's theory, when students are bystanders (as most students are in cases of bullying/cyberbullying), this can be an important time to foster prosocial feelings and empathic/sympathetic distress since youth are a witness to harm others are doing or have done – a condition that Hoffman mentions is critical for empathy arousal. Educators, administrators and parents can also use examples of other teen issues, particularly those indicated on social networking sites, to arouse empathy among youth and help them internalize a sense of guilt that can even extend to "virtual transgressions" encompassing such areas as responsibility guilt and guilt over affluence that can be a spur to action. On the other hand, in instances where children have been identified as aggressors, a different method is required. That is, since Hoffman notes that "children's harmful action usually serves an instrumental purpose such as getting something they want" (p. 135) and adult intervention is key to help youth internalize a sense of guilt over wrongdoing which happens primarily through parental inductions.

According to Hoffman (2000), prosocial models (e.g. parents, teachers, other adults) "reinforce children's empathic dispositions – especially the sympathetic component of empathic distress – and make children more receptive to parental inductions which […] elicit empathic distress and guilt" (p. 143). Therefore, in this complex process, parents plant the seeds and schools (and society at large) nurture the process along. Hoffman notes that there are cultural differences in the development of "self" with western societies (e.g. USA) emphasizing individualism more than Eastern/Asian societies that emphasize interdependence. However, Hoffman contends that empathy is a universal human construct and that, although Eastern/Asian societies may be collectivistic, they still develop an integral sense of self that can be differentiated from others to allow for perspective-taking. In fact, Hoffman notes "it seems unlikely that culture can eliminate conflict. In any case, it seems […] there is nothing more powerful than fights, arguments, and involvement in negotiations over disputes, to sharpen one's self-awareness – indeed, to make it virtually impossible *not* (Hoffman's emphasis) to be aware of the separation of self and other" (p. 276).

Overall, educators and administrators need to have an awareness of the many cultures from which students come so as to better understand the differences among them and how best to promote prosocial interactions online (Michikyan *et al.*, 2014). Some cultures may rely more heavily on mimicry or language-mediated empathy arousal, according to Hoffman, so schools need to be attuned to these differences and how they manifest in student actions – and particularly aware of differences that exist among major cultural representations in schools (e.g. European–Americans, African–Americans, Hispanic–Americans, and Asian–Americans) since each group brings their own cultural constructs to the scene. Above all, culture is an important context for considering empathy development since it may look different from student to student.

Vygotsky (1978) warns that if play (especially isolated play) becomes the main activity of the child, and, hence, becomes the main source of connecting to a realm, that child will have problems distinguishing illusion from the social reality:

> Everything that concerns a child is play reality, while everything that concerns an adult is serious reality. A given object has one meaning in play and another outside of it. In a child's world, the logic of wishes and of satisfying urges dominates, and not real logic. The illusory nature of play is transferred to life. This would be all true if play were in deed the predominant form of a child's activity. But it is difficult to accept the insane picture that comes to mind if the form of activity we have been speaking of were to become the predominant form of a child's everyday activity, even if only partially transferred to real life (p. 102).

In other words, Vygotsky's work advocates for human-mediated play (including virtual play), so that speech and highly abstract cognitive functions (both so uniquely human) can develop via a reality check (a check against the cultural rules, values, etc. that are in place in a given society) and an adaptive transfer of what is learned during play in order for a harmonious social and emotional development to occur.

Conclusions and future directions

This paper has raised several key issues concerning children's interactions in (and with) virtual spaces. There clearly is a need to further explore how youth spend their time in virtual spaces since various reports suggest that children as young as two years old are spending their play time online. Children can develop empathy, as an essential socio-emotional skill through virtual play and various uses of technology only if a human (teacher, parent, peer, etc.) mediates the understanding and applicability of the game process and game results. It is only through human interaction that the child learns to use speech or language (augmentative communication can play an important role here for nonverbal or verbal-limited children) as a tool to develop its other psychological processes, including abstract thinking skills, emotional regulation and prosocial behaviors. Therefore, the interaction (human-to-human, human-to-avatar, avatar-to-avatar) in the virtual world and about the virtual world is most important, not the participation in a virtual realm itself. What we see or what happens in VR cannot automatically be generalized or adapted to the social environment, unless it is mediated by society and culture (see the Cultural-Historical Activity Theory, derived from Vygotsy and Leontiev's works, and which supports that individual consciousness is shaped by the history of each individual's social and cultural experience, Vygotsky, 1978). In other words, only human or human-like interaction can facilitate socialization, blooming of emotional tools, and what it means to be human: "The path from object to child and from child to object passes through another person. This complex human structure is the product of a developmental process deeply rooted in the links between individual and social history" (Vygotsky, 1978, p. 30).

In terms of future research, certainly, an attempt to explicate how emerging media formats assist (or impede) children's social development will pay attention to prosocial behaviors and whether virtual environments facilitate (or can be designed to facilitate) perspective-taking and TOM capacities in young children.

How virtual environments shape children's patterns of affiliation is particularly important since media specialists like Kirsh (2010) suggest (via the friendship reduction hypothesis) that relationships may be weakened in virtual environments where more time is spent with strangers than with known affiliates. Conversely, Kirsh also reports that recent research supports the notion (via the friendship stimulation hypothesis) that virtual environments may actually strengthen affiliative efforts as children tend to seek out offline friends in online settings. Nevertheless, since he also reports that lonely children are not likely to be engaged or build relationships online since they spend more time chatting with strangers, the nature of social isolation needs to be further investigated in online settings.

Identity development through processes of online socialization is another area that merits further attention. Various media experts suggest that disembodied avatars tend to reflect children's real identities, but research to date does a poor job of capturing how children think about the identities they portray online. According to Erikson's stages of identity development, the youngest virtual players would be at the stage of initiative vs guilt wherein the objective is to gain skill in initiating activities and deriving pleasure from the unfolding of these actions. Virtual environments must be adapted to the capabilities of these youngest users, then, to promote these goals. For example, interfaces should be aural and graphical rather than text-based and, although children as young as two or three can be competent using a mouse, the motor skills required of these youngest players should be minimal.

Virtual environments are mere scaffolds that support the development of SEL and, specifically, empathy. VR also provide enriching opportunities for fantasy play and tool use, since these (as discussed by Bateson, etc.) are hallmarks of the developmental period. Thus, effective virtual environments require an even more careful balance of elements (support and scaffolding vs opportunities for independence) than traditional play settings which might be more "forgiving" of successive approximations toward a necessary skill or behavior. For example, in a virtual environment, either the player has the dexterity to successfully select a button to proceed with a task or manipulation fails and the player cannot move forward in the game. In contrast, real-life play settings permit fantasy and object play (e.g. dress up, tea parties, role-playing games) without requiring particular skill sets.

Although school age children have different identity tasks, as posed by Erikson (i.e. industry vs inferiority), there are structures inherent to virtuality that can interfere with appropriate development. Virtual environments appropriate for this age group need to balance opportunities to explore and assuage curiosities with appropriate safeguards (on privacy, access to age-appropriate materials, etc.) and scaffolding to enable these explorations. Children at the youngest range of this group, for example, may not yet have the cognitive capacities to understand cyber currencies (e.g. why their parents will not pay for memberships or value-added features of virtual settings). Similarly, since early school age children are still building skills for making friends, they may be less adept at interacting prosocially in settings where the impact of their words and actions cannot be seen. With the rise and media proliferation of online aggressive incidents, fostering positive social interactions among the youngest players in online environments is critical to developing a prosocial populace. Hopefully, future research can address skill disparities in virtual playgrounds and consider potential impacts to identity development, especially for the youngest players.

Used intelligently, online tools can be a medium of empathic development and inductions, identity exploration, and new avenues of pretense, object play and even (via gaming consoles and simulated environments) rough-and-tumble play, albeit in qualitatively different ways than traditional play settings. As technology continues to evolve, so will the elements of virtual worlds that facilitate play and development. If, as Bateson notes, play helps develop skills needed later in life, it is particularly critical that children's virtual environments not only build children's technological capabilities (which are increasingly necessary in a global society) but also strengthen relational skills and problem-solving capacities.

Media interactions do not necessarily prevent the development of empathy but they cannot teach it by themselves. Again, it takes a village – it is up to the surrounding community (parents, teachers and schools) to help students develop empathy that can then be applied to new media settings. Like an ax that can be used constructively or not, new technology can be a tool used for a variety of purposes. Students need to be taught empathy outside the online environment so they can integrate these skills into their use of new technology applications (which often have severe consequences for lack of empathy, as in cyberbullying), hopefully using the ease of friend networks to provide support, demonstrate empathy, and build relationships in a positive and healthy manner.

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