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Five days at outdoor education camp without screens improves preteen skills with nonverbal emotion cues

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ABSTRACT

A field experiment examined whether increasing opportunities for face-to-face interaction while eliminating the use of screen-based media and communication tools improved nonverbal emotion–cue recognition in preteens. Fifty-one preteens spent five days at an overnight nature camp where television, computers and mobile phones were not allowed; this group was compared with school-based matched controls ($n = 54$) that retained usual media practices. Both groups took pre- and post-tests that required participants to infer emotional states from photographs of facial expressions and videotaped scenes with verbal cues removed. Change scores for the two groups were compared using gender, ethnicity, media use, and age as covariates. After five days interacting face-to-face without the use of any screen-based media, preteens' recognition of nonverbal emotion cues improved significantly more than that of the control group for both facial expressions and videotaped scenes. Implications are that the short-term effects of increased opportunities for social interaction, combined with time away from screen-based media and digital communication tools, improves a preteen's understanding of nonverbal emotional cues.

1. Introduction

For several millennia, humans' primary method for social learning and communication has been face to face. In the 21st century, as mobile technology and the Internet became available to most of the world's population (Internet world stats, 2013), digital media have become an increasingly prevalent factor in the informal learning environment (Greenfield, 2009). Children today, ages 8–18, spend over 7½ h a day, seven days a week using media outside of school (Rideout, Foehr, & Roberts, 2010). Moreover, teenagers, ages 12–17, report using phones to text message in their daily lives more than any other form of communication, including face-to-face socializing (Lenhart, 2012). The extensive time that children and teenagers engage with media and communicate using screens may be taking time away from face-to-face communication and some in-person activities (Giedd, 2012). Indeed, one longitudinal study found that the amount of non-screen playtime decreased 20% from 1997 to 2003, while screen activities (i.e., watching television, playing videogames and using the computer) increased (Hofferth, 2010).

The advent of mobile technology enables today's youth to access and engage with screens 24/7 outside of school while in cars, on vacations, in restaurants, and even in bed. A recent poll found that children's access to these kinds of devices has grown fivefold in the last two years (Common Sense Media, 2013). Extant research indicates that, today, media exposure begins at early ages, consumes the majority of youth leisure time, and takes place in many different environments and contexts. Such extensive use of new technology has raised concerns that children's face-to-face communication skills may be negatively affected (Bindley, 2011; Giedd, 2012).

1.1. Face-to-face and mediated communication

When engaging in face-to-face communication, social information is conveyed by vocal and visual cues within the context of the situation. Nonverbal communication, defined as communication

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without words, includes apparent behaviors such as facial expression, eye contact, and tone of voice, as well as less obvious messages such as posture and spatial distance between two or more people (Knapp & Hall, 2010). The understanding of these kinds of nonverbal social cues is particularly important for social interaction because of the need to modify one's own behavior in response to the reactions of others (Knapp & Hall, 2010). The capability to effectively process emotional cues is associated with many personal, social and academic outcomes (Knapp & Hall, 2010; McClure & Nowicki, 2001). In addition, children who better understand emotional cues in a social environment may develop superior social skills and form more positive peer relationships (Blakemore, 2003; Bosacki & Astington, 1999).

Long before digital media became ubiquitous, investigators developed theories, such as the Cues-Filtered-Out theory, which postulated that the lack of nonverbal cues in computer-mediated interactions could lead to impersonal communication, (Culnan & Markus, 1987), while others pointed out deficits in computer-mediated communication due to the lack of social-context cues (Sproull & Kiesler, 1988). More recently, an experiment exploring the difference in emotional connectedness experienced by emerging adults using either in-person or digitally mediated communication showed that bonding and affiliative cues were significantly stronger when friends communicated in person rather than by text (Sherman, Michikyan, & Greenfeld, 2013). The extensive use of digital media, often text-based and thus inherently lacking nonverbal emotional cues, may thus curtail the face-to-face experiences necessary to master important social skills, even though they are used for social communication (Giedd, 2012).

1.2. The video deficit

Research regarding what children do and do not learn about the social world through screen-based media, in particular television, is robust (Guernsey, 2011; Richert, Robb, & Smith, 2011; Wartella, 2012; Wartella, O'Keefe, & Scantlin, 2000). Much of the research concentrates on early learning from imitation, socially contingent interaction (e.g. joint attention and gaze following), and word learning (Flom & Johnson, 2010; Moore & Dunham, 1995). This body of research shows that young children learn better from live interaction than from screens. For example, Hayne, Herbert, and Simcock (2003) performed a series of experiments using matched live and videotaped models who performed a series of actions with a rattle and stuffed animals. Although children imitated televised models, the mean imitation scores were significantly higher in the live condition. This discrepancy in imitation appears to last until 30 months of age and was coined the "video deficit."

1.3. Reading nonverbal emotion cues: processes of development and learning

Features of face-to-face communication such as eye contact and pointing are crucial when teaching young children about social interaction and the world they live in. For example, gaze following, a well-studied mechanism in the literature on human development, guides infants from around one year of age to learn about objects and humans (Flom & Johnson, 2010). Humans also learn from cues such as pointing when interacting socially (Moore & Dunham, 1995). Once a child is able to attend to an object that another person highlights, their ability to learn through social interaction increases. These means of learning are available only when a child can see another's face and physical being (Gross & Ballif, 1991).

In-person interaction also develops the accurate understanding of nonverbal emotion cues. For instance, cooperative interaction among siblings in the third year of life has been shown to predict skill in affective labeling of facial expressions and understanding of emotions in dramatized puppet scenarios in the fourth year of life (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). The children's positive behavior toward their siblings in the third year of life continued to predict more advanced understanding of emotions at six years of age (Brown & Dunn, 1996). These longitudinal findings point to in-person peer interaction as a key learning experience in the early acquisition of skill in reading nonverbal emotion cues.

As children grow older, their peer focus shifts from siblings to unrelated peers, whom they usually meet in school. In preadolescence, the period under investigation in the present research, social interaction skill with peers, assessed in an in-person school situation, was correlated with an understanding of feelings presented in narrative (Bosacki & Astington, 1999).

2. Research question and hypothesis: the present study

In the present study, we designed a field experiment to ask the research question: Does children's frequent screen use—and the possibility that this extensive use replaces critical face-to-face communication—promote the development of emotion understanding to the same extent as in-person interactions? If not, a shift in children's activities to solely in-person peer and adult communication could enhance skill in understanding the emotions of other people.

Our experimental condition was a naturally occurring environment where children experienced extensive opportunities for social interaction, combined with no access to screens, for five days. Our participants were preteens in the sixth grade. We chose this age group because: (1) by the time they reach early adolescence, children are able to integrate information from many nonverbal cues, including face, gesture and tone, to make inferences about social situations (Knapp & Hall, 2010); (2) the understanding of social emotions and the ability to take into account another person's perspective are some of the most dramatic changes during adolescence (Dumontheil, Houlton, Christoff, & Blakemore, 2010); and (3) this is an age when many children begin to access personal mobile technology and media use peaks (Rideout et al., 2010).

We investigated whether an absence of screens, and, accordingly, increased opportunities for face-to-face communication, gave children the context to be more sensitive in comprehending nonverbal emotion cues. Our hypothesis was that, relative to a matched control group that continued their usual daily activities –including screen-based activities– both in and outside of school, children's skill at recognizing emotion from nonverbal cues would improve after five days of increased opportunity for face-to-face interaction in an environment without screens.

3. Method

3.1. Design and Participants

The study design involved a pre- and post-test, and a no-intervention matched control group. Both the experimental and control (i.e., no-intervention) groups were comprised of sixth graders recruited from the same public school in Southern California. The experimental group included 51 children from the Spring 2012 class, and the control included 54 children from the Fall 2012 class. Given that the two groups attended the same public school, the groups were drawn from the same population and therefore matched on many important demographic variables. In an average day of the week during the school year, both groups reported spending approximately 4 1/2 h a day outside of school texting, watching television, and playing videogames (see Table 1 for key demographic variables for both groups).