Outdoor Education Camp without Screens Improves Nonverbal Emotional Cues in Preteens

Authors:

Yalda T. Uhls, Minas Michikyan, Jordan Morris, Debra Garcia, Gary W. Small, Eleni Zgourou, Patricia M. Greenfield

Katherine Miller, Maddie LaPorte, Caleb Chapman, Cole Amdur and Kyle Dixon

Introduction

- Negative effects of technology : communication
  - Social interaction
  - Face to face communication
  - emotional cues
- Nonverbal communication: communication without words
  - Facial expressions
  - Tone of voice
  - Eye contact
  - Posture
  - Spatial distance
- Another study found non-screen playtime decreased 20% from 1997 to 2003
- Children ages 8-18 spend 7.5 hours a day using media outside of school
- Teenagers use texting for their primary form of communication
- Benefits of face to face interaction
  - Understanding of expressions
  - Kids learn better from live interaction
  - Understanding of emotional cues

Research Question and Hypothesis: the present study

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?

Why 6th graders?

- able to integrate non verbal cues and apply them to social situations
- dramatic changes in understanding of social emotion occurs during adolescence
- media access and use peaks

Hypothesis: compared to the control group, children without screen time will improve the skill of recognizing emotion from non verbal cues after the 5 days of face to face interaction

Methods: Design and Participants

105 children were recruited from the same public school in Southern California. 51 kids from the spring 2012 class and 54 from the fall 2012 class. The students came from similar demographic backgrounds such as family income. The students average time spent on screens outside of school (texting, T.V., video games) was 4 ½ hours a day.

The study was conducted at an educational camp, located 70 miles from Los Angeles. No electronic device was allowed to make sure the study was not compromised in anyway. The students were given pre and post tests to collect data. The study was able to get participants through one public school, where the school signed the students up, without the students being chosen. The camp was an educational camp where students learn science through outdoor activities, such as hiking, living in cabins and team building exercises.

They considered using data from a technology camp, but decided not to as it would change the similar demographics of the participants. The camp they were considering costs $2000 a week to attend, as compared to this camp that is done through the school.

Methods: Measures

For a control group measure, participants were given a questionnaire measuring their daily media usage. The control group looked at the average times students spent on their screens. 2 tests were used as the dependent variable to look at their ability to understand nonverbal communication:

Faces subtest of the second edition of the diagnostic analysis of Nonverbal Behavior (DANVA2):

- This test is a well validated test that uses 48 faces (24 kids, 24 adults) that showed different emotions at different intensities for 2 seconds on a screen. The subjects were than asked to identify the emotion displayed to the children. They were scored on the errors they made.

The Child and Adolescent Social Perception Measure (CASP) :

- This test measured the children's ability to identify nonverbal cues in a setting that was closely represented to real life. 10 video taped scenes were shown to the children without audio to see if they could accurately describe the nonverbal cues of the actors in the videos. The videos represented likely situations where they are in school or at home.

During both tests was a time gap. To act as a distractor, the participants were given the Forward Digit Span, which is a subset of the Wechsler Intelligence Scale for children.

Table 1

Table 1
Key demographics for the experimental and control groups.

	Camp	Control
Sample size and gender	51 (25 Boys; 26 girls)	54 (26 Boys; 28 girls)
Age (yrs; mean ± SD)	11.86 ± .46	11.81 ± .52
	Range 11–13	Range 11–13
Ethnicity*	White 26 (51%)	White 11 (20%)
	Hispanic 9 (18%)	Hispanic 9 (17%)
	African American 1 (2%)	African American 1 (2%)
	Asian 9 (17%)	Asian 19 (35%)
	Other/mixed 6 (12%)	Other/mixed 14 (26%)
Parents' education	Mother:	Mother:
	Finished high school 5 (10%)	Finished high school 7 (12%)
	Some college 10 (20%)	Some college 10 (18%)
	Finished college 15 (29%)	Finished college 21 (37%)
	Beyond college 6 (12%)	Beyond college 5 (9%)
	Father:	Father:
	Finished high school 6 (12%)	Finished high school 9 (16%)
	Some college 9 (17%)	Some college 7 (12%)
	Finished college 18 (35%)	Finished college 21 (37%)
	Beyond college 5 (10%)	Beyond college 3 (5%)
Media use/ownership	22 (43%) Own phone	26 (48%) Own phone
	51 (100%) Computer at home	52 (96%) Computer at home
Media use (mean ± SD) hours per school day	Texting: .9 ± 1.3	Texting: 1.1 ± 1.6
	Watching TV: 2.4 ± 1.4	Watching TV: 2.1 ± 1.6
	Playing video games: 1.2 ± 1.3	Playing video games: 1.4 ± 1.4

Note: no variables were significantly different between experimental and control groups except for *ethnicity: $t_{(105)} = -2.95$, $P < 0.01$. However, ethnicity was not correlated with change scores on the dependent variables. Percentages of parents' education do not total 100% because some subjects did not know their parents' educational history.

Procedure

Experimental group: 6th grade class took media survey upon arriving at the camp, Then Split into 2 groups attached to administrators where they were given pre-tests, Group 1 took DANVA2 then the digit span then CASP, group 2 took CASP then the Digit Span then DANVA2, Post-tests were administered on the friday before the ride home in the same groups as the pre-tests, Social media surveys were not administered again

Control group: Children split into classes, Testing administered at approximately same times as The experimental groups, Same procedures followed as experimental groups

Distractor tasks were placed in between each test

Table 2
Sample list of classes in a day at Pali Institute.

Class name	Description
Forest ecology	Students hike through the forest to explore and learn about the ecosystems around them. They identify flora and fauna and participate in hands-on activities. Through these various activities, students understand the history of the forest as the ecosystems come alive before their eyes
Outdoor skills	Mixing nature's beauty with outdoor survival, students learn the Ten Essentials for any outdoor trip. They learn fire-building and cooking food in an outdoor setting. While in the forest, they will band together as a team to build emergency shelters. By the end of this class, students understand basic principles of exploring the great outdoors
Animal survivor	Students are taught the importance and dynamics of food chains/webs and how species depend on one another for survival. In a fast-paced activity, students are assigned an identity: carnivores, herbivores or omnivores. They must search for food while avoiding predators (their peers). Each student begins the game with a certain number of lives and must have at least one life remaining at the end to be a "survivor"
Day hike	Schools have the opportunity to select their focus for a hike, such as birding, visiting a nature center and greenhouse, or shortened versions of a double-session forest ecology or outdoor skills class
Archery	Students learn the history and mechanics of archery, one of the oldest arts and means for survival. They are introduced to the basic physics of a bow and arrow, as well as the proper handling of this ancient device. With this knowledge, they participate in target shooting. Students gain an understanding of the importance of archery and its influence on society
Orienteering	Students find their sense of direction while engaging in one of several orienteering courses. During the expedition, they learn how to navigate through the forest by using compasses and coordinates. They gain an understanding of the various skills involved in planning travel from point A to point B

Note: (each lesson approximately 90 min); link to curriculum for Pali Mountain outdoor education program: <http://www.paliinstitute.com/oe.html>.

Analysis

- Independent samples T-test, compared socio-demographic characteristics, dependent variables at pretest, media use, and social variables
- No significant difference found
- Combined data from both administration groups, conducted same analysis to compare sociodemographic characteristics and media use across conditions
- One significant difference found, Ethnic composition $(t(105) = 2.95, P < 0.01)$
- Ran correlational analysis to determine if ethnicity is related to dependent variables, it was not
- Used Change scores as dependent variable due to literature indicating that reliability of gain scores is higher
- Measured difference between pretest and posttest scores on each measure
- DANVA change scores calculated by subtracting posttest errors from pretest errors, ranged from -10-31
- CASP change calculated by subtracting total emotion percentage correct on pretest from total emotion correct on posttest ranged from -14%-31%, positive showed improvement, the three coders achieved inter-rater reliability on 20% of CASP responses , (Cronbach's alpha = .93)
- Lastly, univariate analyses of covariance, using gender, ethnicity, and age, as well as a composite variable called media-use sum (i.e., sum of time spent watching television, playing video games, using cell phones, and using computers) as covariates, in order to control for demographics and prior media use.

Results

Experimental condition showed significant improvement in reading facial emotion:

- Experimental: 14.02 errors to 9.41 errors
- Control: 12.24 to 9.81
- Greater reduction of errors in the experimental condition

Videotaped scenarios:

- Control: no change in pretest and posttest scores, remained at 28% correct
- Experimental: 26%-31% correct

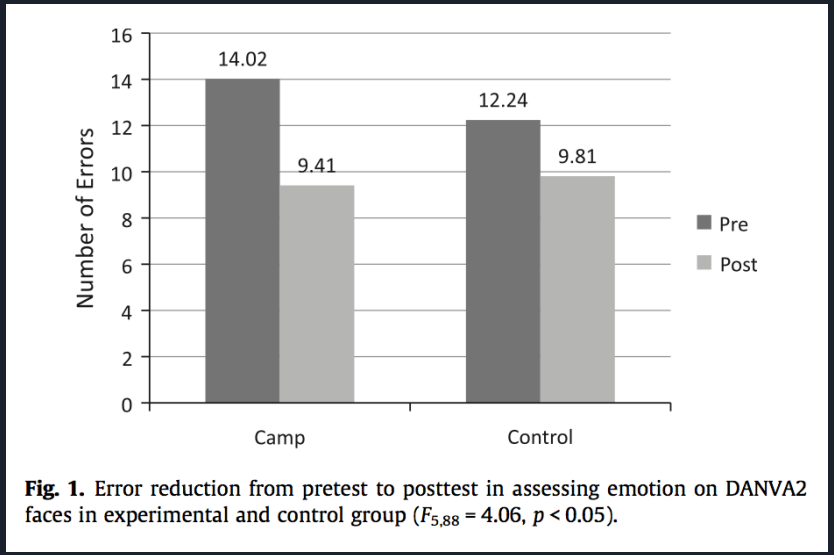

Fig. 1. Error reduction from pretest to posttest in assessing emotion on DANVA2 faces in experimental and control group ($F_{5,88} = 4.06$, $p < 0.05$).

Discussion

- Increased social and digital media usage from a young age
- Screens and devices used in classroom settings more often
  - Implemented in elementary classrooms across the country
- Preteens deprived of screen-based media and communication improved on measures of nonverbal emotion
- In-person communication and face-to-face interactions contributed to the observed effect
  - Interactions were with both peers of the same age and adult camp counselors

Discussion Cont.

- Certain studies show that being in nature (more isolating than an urban setting) can help pre-teens better understand the emotions of others
  - More relaxed environment, slower pace, increased focus

- Findings from this study are compatible with developmental research which:
  - Highlights the importance of in-person human interaction
  - These interactions lead to elevated understanding of the emotions of others

Discussion: Limitations/Future Research

- Limitation:
  - Difficult to decipher between the effects of group experience, nature experience, and absence of screens.
    - Hypothesis assumes that the face-to-face group interactions were the critical factor
    - This hypothesis is only assumed, not proven
- Future Research and Next Steps:
  - Generalize/broaden findings
  - Apply similar testing (deprivation of screen time) but substitute with a different activity

Article Citation

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