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Online recruitment and testing of infants with Mechanical Turk

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ABSTRACT

Testing infants in the laboratory is expensive in time and money; consequently, many studies are underpowered, reducing their reproducibility. We investigated whether the online platform, Amazon Mechanical Turk (MTurk), could be used as a resource to more easily recruit and measure the behavior of infant populations. Using a looking time paradigm, with users' webcams we recorded how long infants aged 5 to 8 months attended while viewing children's television programs. We found that infants ($N = 57$) were more reliably engaged by some movies than by others and that the most engaging movies could maintain attention for approximately 70% of a 10- to 13-min period. We then identified the cinematic features within the movies. Faces, singing-and-rhyming, and camera zooms were found to increase infant attention. Together, we established that MTurk can be used as a rapid tool for effectively recruiting and testing infants.

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Introduction

Infants are difficult to recruit and test. Recruiting their busy caregivers requires broad advertising, collaboration with day-care facilities or maternity hospitals, and labor-intensive relationship building. As a consequence, it often takes long periods of time to recruit a sufficient number of participants. Once recruited, the schedules of the caregivers, infants, research staff members, and testing facilities must be coordinated, and practicalities such as transport must be resolved. Given these complexities,

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infant studies are relatively slow and expensive and also require patience and perseverance. This puts pressure on investigators to minimize the number of participants recruited, and as a result studies are sometimes under-powered, reducing their reproducibility (Peterson, 2016), reflecting a broader issue in psychology (Open Science Collaboration, 2015). Thus, to make it easier to conduct high-quality infant research, it is imperative to find ways in which to reduce these pressures.

One solution may lie online. During recent years, the crowdsourcing engine Amazon Mechanical Turk (MTurk) has become a central marketplace, bringing together hundreds of thousands of workers from more than 100 countries to complete "human intelligence tasks" (HITs) through a web browser for modest remuneration (see Crump, McDonnell, & Gureckis, 2013, for a review; Buhrmester, Kwang, & Gosling, 2011; Kittur, Chi, & Suh, 2008; Mason & Suri, 2011; Pontin, 2007). Often these tasks involve image annotation, rating surveys, and demographic questionnaires using templates delivered by MTurk (Mason & Suri, 2011; Paolacci, Chandler, & Ipeirotis, 2010). However, by employing external websites, requestors can generate more complex tasks that meet the demands of their experimental needs (Buhrmester et al., 2011; Goodman, Cryder, & Cheema, 2013; Mason & Suri, 2011). In combination with MTurk's simple interface and flexibility, this lends itself well to the fast and cost-effective collection of data.

Recently, experimental psychologists have used MTurk to obtain data from adults on simple tasks (Lewis, Sugarman, & Frank, 2014; Piff, Stancato, Côté, Mendoza-Denton, & Keltner, 2012; Starmans & Bloom, 2012; Sweeny, Andrews, Nelson, & Robbins, 2015). Parental report measures of child behavior have also been documented (Schneider, Yurovsky, & Frank, 2015); however, to our knowledge, direct testing of infants has never been attempted. Therefore, the aim of the current study was to examine whether MTurk could be used to recruit and test infant populations. To address this, we implemented a task that aimed to quantify looking time to a set of video stimuli in infants aged 5 to 8 months. Specifically, infants viewed children's television programs, and attention was quantified by measuring when infants fixated on the screen using their webcams.

Method

Participants

Ethical approval was obtained from Western University's health sciences research ethics board. We recruited infants aged 5 to 8 months using MTurk (Amazon, Seattle, WA, USA). All workers of MTurk remain de-identified and are referred to only by a unique worker identity code provided by Amazon. To participate, infant caregivers agreed to the Amazon MTurk Participation Agreement (https://www.mturk.com/mturk/conditionsofuse), which included the declaration that they were at least 18 years old, provided informed consent, and were required to have a webcam, speakers, and Adobe Flash. The same experiment was administered in two independent batches differing in compensation rate. During the first batch, 63 participants were recruited over the course of a week, reimbursing each with $1.25 (U.S.). To motivate increased participation, remuneration in the second batch was raised to $5.00, leading to 84 participants being recruited within the following 6 days. Altogether, 147 participants were recruited. However, due to the quality control requirements of our study and the difficulty of infant testing in general, 90 were excluded. The causes were technical issues associated with internet connectivity bandwidth (no webcam video being obtained from the server ($n = 3$), the webcam video becoming desynchronized from the movie ($n = 43$), the quality of the recorded video (infant's eyes not being visible; $n = 22$), blurry video ($n = 5$), and the location of the webcam being changed ($n = 1$)). Participants were also excluded if they were not infants ($n = 11$), self-reported an age outside our specifications ($n = 3$), or did not fully complete the experiment ($n = 2$). Of the remaining 57 participants included in the study ($M_{age} = 6.49$ months, $SD = 0.93$), 9 were 5 months old, 19 were 6 months old, 21 were 7 months old, and 8 were 8 months old.

Stimuli and video recording

Ten movie clips between 9 and 13 min in length were used as stimuli. They were taken from popular programs designed to appeal to infants and children: *Baby Einstein, Blue's Clues, Curious George,*

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