**Study Protocol and Statistical Analysis Plan**

**Title of study:** Babies' Expectations About Racial Interactions
**NCT number**: NCT05324007
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**Study Protocol**

***Objectives***: The ability to categorize people into social groups is thought to arise early in human development (Liberman et al., 2017b). Language and race are often considered salient social categories that adults use to categorize and discriminate people. Infants also use language as a meaningful and inductive category: extensive research indicates that infants show preferences based on language (Kinzler et al., 2007; Pun et al., 2018) and infer communicative and social relationships based on language groups (Liberman et al., 2017a). In contrast, less is known about whether infants use race as a meaningful social cue. Past research has focused on infants' perceptual categorization skills that suggest infants can use race to make perceptual distinctions: For example, at 3 months of age, infants prefer to look at faces of people from their own-race (or races they are familiar with) over other-races (or races they are not familiar with) (Kelly et al., 2005). However, less is known about whether infants use race as an inductive social category. The current study therefore examines whether infants use race to predict social relationships as they do for language.

In the following, racial outgroup individual indicates an individual who is of a race that is different from the races of the infants' primary caregivers or parents. Racial ingroup individual indicates an individual who is of the same race as the infants' primary caregivers/parents.

***Design***: The study will be conducted online on a platform called Lookit (lookit.mit.edu), in which participants can log on to this website to complete the study. The study will last about 10 minutes with parents providing consent via recorded videos, having their infants watch video stimuli, and then completing a demographic questionnaire after their infants finish watching the video stimuli. While infants watch the video stimuli, they are recorded via a webcam that is safely stored and accessible only by researchers. See https://lookit.readthedocs.io/en/develop/index.html for more details about this online platform.

The design of the study is based on Liberman et al. (2017a) but adapted for an online format. Infants will be randomly assigned to one of three conditions: (1) Black-White, (2) Black-Black, and (3) White-White. Black-White condition will consist of one White female and one Black female individual. White-White condition will consist of two White female individuals and Black-Black condition will consist of two Black female individuals. In total, there are four different White and three different Black actors. The pairings between the two actors will be counterbalanced across infants such that each actor will be presented in all conditions.

***Methods***:

*Sample & recruitment*. We will recruit infants between the age of 8 months;1 day to 15 months;1 day. No participant will be excluded on the basis of sex/gender or race and ethnicity. All participants – regardless of sex/gender, race, and ethnicity – will be randomly assigned one of the three conditions. Participants will be recruited from the Lookit participant database, in which families have voluntarily signed up to be contacted for studies in which their children are eligible for on the the platform. In addition, we will recruit from an existing University of Chicago Center for Early Childhood Research (CECR) participant pool (http://babylab.uchicago.edu). The participant pool has over 4000 children that range in age from birth to school age. Currently,

the participant pool has 76 eligible infants in our targeted age range, but infants are consistently aging into this age range and year-round recruitment efforts are conducted such that typically our laboratory have successfully completed testing of 100 to 150 infants within a year. We have a strong track-record of recruiting and testing infants from racially and linguistically diverse backgrounds. Participants are typically contacted through phone or email by trained research assistants to participate in the study. Recruiting from these established participant pool typically results in ~50% inclusion of females. The racial and ethnic composition of the sample is expected to reflect the composition of the U.S. To ensure we continue to recruit a representative percentage of minority children, we will carefully monitor enrollment and include more recruitment efforts to cater to minority children as needed.

*Procedure*. Parents who have indicated they are willing to be contacted for studies from the database with infants in the eligible age range will be emailed a link to the study to participate. The parents can then click on the link and follow the instructions on screen to read about the description of the study and a consent document. If the parents decide to participate, they will be instructed to read the consent form and provide online permission by recording a video of themselves reading a statement, "I have read and understand the consent document. I am this child's parent or legal guardian and we both agree to participate in this study." Because the infants are not able to provide assent, no assent was obtained. Parents will have the option to download and/or print the forms to retain a copy for their files. Only participants with a valid consent will be permitted to participate in the study.

Participants will be randomly assigned to one of the three conditions: (1) Black-White, (2) Black-Black, and (3) White-White. In all conditions, infants will first view familiarization then test trials. In the familiarization trials, infants will begin by viewing four trials of familiarization. The familiarization trials will consist of two female actors facing forward and talking about infant-friendly topics like the weather, grocery shopping, school, or stars in a neutral-positive speech. The order in which actors speak and their pairings will be counterbalanced across participants. Each trial will last 10.5 seconds and be repeated four times. After familiarization, infants will view six test trials. Three of these test trials will be affiliation trials and three will be disengagement trials. In the affiliation trial, the two actors start by facing forward, turn to face each other, and then wave at each other saying "Hi!", while smiling. In the disengagement trial, the actors start by facing forward, turn to face each other, and then make a "Hmph!" sound and turn their backs to one another. Both types of trials have the same overall length of the interaction and the actors maintained the same distance from each other throughout the trial so that they were the same distance apart during both affiliation and disengagement. Each test trial will last 3 seconds, with a still image of the actors for 15 seconds after the trial ends. Each test trial therefore will last 18 seconds. This length is in line with the maximum 20 second test trial used by the case study on Lookit (Scott et al., 2017). The affiliation and disengagement trials will be presented in an alternating order and the order will be counterbalanced across participants. Looking time at the still images will be measured at each trial.

After completing the trials, parents will complete a survey that asks basic demographic information and provided an option to complete an additional, optional social network questionnaire. In this demographic survey, parents will provide racial, ethnic, and linguistic information about themselves and their infants, as well as questions about their neighborhood trust and zip code in which the infant resides. Parents will also have an option to complete a

social network questionnaire about the people the infants see and interact with on a weekly and daily basis in the past month. Racial, ethnic, and linguistic demographic information about these individuals will be collected. Describe in detail below in *Measured variables* section.

Participants will be compensated $5 (gift card) within approximately a week for their participation. If they complete the optional additional survey on infants' social network, they will be compensated an additional $5. To be eligible for the gift card, the infant must be in the age range of the study (i.e., 8 months; 1 day – 15 months; 1day) and the parent must provide and submit a valid consent statement. We will still provide compensation for the family even if they do not finish the study or we cannot use the infant's data.

Data will be excluded if we observe any parental interference during the study. We will include data as long as infants complete at least one affiliation and one disengagement trial to maximize including data as much as possible.

*Measured variables.*
We will use the following outcome variables: (1) Looking time during familiarization: We will record looking times during each 4 familiarization trials per infant. (2) Looking time during test trials: We will record the looking times during each 3 affiliation trials and 3 disengagement trials for each participant.

*Demographic variables:* (1) Infant race/ethnicity: One or more of the following categories can be used by the parent to identify their infant's race/ethnicity: American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, White, Native Hawaiian or Other Pacific Islander, Other (which parents can specify any other race/ethnicity) (2) Infant language exposure: parents can select from the following categories: monolingual, exposure, bilingual/multilingual. Parents will also be asked to indicate what language(s) their infants are exposed to. (3) Parent education level: This will consist of 8th grade or less, 9th-12th grade no diploma, High school graduate or GED completed, Some college credit but no degree, Associate degree (AA, AS), Bachelor's degree (BA, BS, AB), Graduate or professional degree.

*Exploratory variables*: These measures were collected to explore questions about how infants' social environments may potentially relate to infants' looking patterns.

*Neighborhood variables*: (1) Infant's current zip code: This information will be used to derive neighborhood racial demographics, neighborhood median income, and neighborhood population density at the zip code level using the most recent American Community Survey (ACS) U.S. census data. (2) Neighborhood trust: This is a parent-reported measure of whether parents judge their neighbors as trustworthy. This value will be calculated by summing responses from the "social cohesion and trust" scale from (Sampson et al., 1997).
*Social network variables*: (1) Network racial entropy: This value will be calculated using the R package "entropy" using parent reported social network demographics and calculated for each participant. (2) Network racial EI Index: This value will be computed using the 'egor' package and will be calculated as follows: (the number of people who are from different racial backgrounds from the child) – (the number of people who are from the same racial backgrounds

as the child)/Network Size. (3) Network size: This value will be derived from parent reported social network demographics by counting the total individuals reported in the infants' network.

**Statistical Analysis Plan:**

Trained research assistants will view study videos to measure how long infants looked at the familiarization trials and test trials. These research assistants will be blind to the hypotheses of the study, will not know what condition the infants were assigned to, and will not have access to identifying information, including name and birthdate, when they are coding these videos.

*Preliminary analyses.* To check that attention during familiarization do not differ according to condition: A mixed ANOVA with trial number (first, second, third, and fourth) as a within-subjects factor, and condition (White-White, Black-Black, and Black-White), infants' age, and infants' sex as between-subjects factors will be run on looking time during familiarization. We predict that infants' attention will decrease as trial number increases in familiarization but no difference across conditions. To check that trial order, infants' age, and infants' sex does not influence infants' attention during test trials: A mixed ANOVA with test trial order (affiliation first or disengagement first), infants' age, and infants' sex as between-subject factor will be conducted. We do not expect any significant effects from these preliminary analyses as previously found in (Liberman et al., 2017a). However, if any of the above factors are significant in relation to test trial looking time, we will include them as covariates in the following main ANOVA model.

*Main analyses*. A mixed ANOVA with condition (White-White, Black-Black, and Black-White) as a between-subjects factor and test trial number (first, second, or third) and test type (affiliation vs. disengagement) as within-subjects factors on the dependent variable of looking time during test trials will be conducted. If there is a significant interaction, each condition will be analyzed separately by performing the same repeated-measures ANOVA on test trial looking times for each condition with trial number and test trial type as within-subject factors.

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