Reproducing the Mehr, Song & Spelke (2016)

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11   Abstract

12   A reproduction of the analysis for Experiment 1 from Mehr, Song & Spelke (2016). Five

13   month old infants were exposed to one of two novel songs containing different melodies with

14   lyrics and rhythms being the same. Infants either heard the songs through a toy in which

15   their parent's voice was recorded or heard it live by a friendly unfamiliar person initially and

16   later through video recording. Infant's selective attention was tested by having them listen

17   to two presentations of either familiar or unfamiliar songs. Infants payed attention to the

18   familiar song, sung by their parent in the past. No infant preference was observed between

19   the toy onto which parent's voice was recorde or a video recording of an unfamiliar person,

20   briefly met by an infant initially. Infants in the later two conditions retained the memory of

21   the melody for longer than 8 months. These findings suggest that songs performed by

22   parents at home convey social meaning to a child.

23   *Keywords:* music, social cognition, memory, infant development, open data, open

24   materials

25   Word count: X

₂₆   Reproducing the Mehr, Song & Spelke (2016)

₂₇   This is an example of creating an APA manuscript using papaja, and also an example

₂₈ for part 2 (APA paper in R markdown) of the midterm assignment. This script will enable

₂₉ to recreate APA style manuscripts using R markdown. This report re-produces the analysis

₃₀ of Experiment 1 reported in Mehr, Song & Spelke (2016) (**???**). The data were downloaded

₃₁ from https://github.com/693284/papajaTest/blob/master/MehrSongSpelke2016.csv Music is

₃₂ universal to most human beings. Children and infants often listen to their parents' singing.

₃₃ Parents usually sing in a style relatable across different cultures. What is the reason behind

₃₄ children paying attention to these types of songs? Mehr and his colleagues in 2016 tested the

₃₅ hypothesis that melodies convey social meaning to infants. Specifically, these melodies

₃₆ inform us about social bonding. Mehr and colleugues assert that children are exposed to

₃₇ melodies that are shared within a specific social group. As children grow up in a specific

₃₈ culture, childrent get exposed to certain tune or songs (e.g., "Babushka Baio"), while in a

₃₉ different culture a child might be exposed to a different song (e.g., "My Little Love"). Thus,

₄₀ when an infant hears a stranger singing a song that a child recognizes, this song may convey

₄₁ crucial information that this stranger can belong to the same social group. To test whether

₄₂ this is so, the researchers conducted an experiment in which they recruited 32 infants with

₄₃ their parents. The experiment had two phases. During the first phase the participants visited

₄₄ to the lab during which the parents were taught a new lullaby that neither the parents nor

₄₅ thier child heard prior. After learning the new lullaby, parents sang it to their child every

₄₆ day for the next 1-2 weeks. After the completion of the exposure period, participants (parent

₄₇ and thier infant) returned to the lab to complete the second phase of the experiment in

₄₈ which infants first saw a screen with side-by-side videos of two strangers. Strangers were

₄₉ silently smiling while looking at the infant. To establish a baseline, infant's gaze direction

₅₀ was recorded. Following the baseline recordings, infants saw two strangers on the screen,

₅₁ singing either the lullaby that the perents learned in the first phase of the experiment or a

₅₂ different lullaby containing different melody but with the same lyrics and rhythm. Please

⁵³ refer to Mehr et al. (2016) Experiment 1 for more details on experiment's methods.

Methods

⁵⁵ We report how we determined our sample size, all data exclusions (if any), all
⁵⁶ manipulations, and all measures in the study.

Participants

⁵⁸ There were 32 participants (5 month old infants; 17 females; mean age = 5.61 months,
⁵⁹ SD = 0.31, range: 5.06–6.11)

Material

⁶¹ The details of the Melodies are Social for Infants experiment are reported in Mehr et.al,
⁶² (2016)

Procedure

⁶⁴ The infant sat on his or her parent's lap, about 5 ft away from a 55- × 40-in.
⁶⁵ projection screen. During the experiment the parent had to sit with his or her eyes closed as
⁶⁶ well as had to wear noise-canceling headphones that played masking music. Testing the
⁶⁷ selective-attention included four parts. Infant first saw side-by-side high-definition video
⁶⁸ recordings of the two strangers, smiling while directly looking at the infant, for 16 s (baseline
⁶⁹ trial). Next, the infant saw, first, one 22-s video of each of the two strangers singing one of
⁷⁰ the two songs while keep looking and smiling at the infant (familiarization trials). Finally,
⁷¹ the infant watched a silent 16-s test trial that was precise to the baseline trial. To keep
⁷² infant's eyes attending to the center of the screen before the baseline and test trials,
⁷³ researchers made an object with an attractive sound appear at the center of the screen. ##
⁷⁴ Data analysis We used R (Version 3.5.2; R Core Team, 2018) and the R-packages *data.table*
⁷⁵ (Version 1.12.0; Dowle & Srinivasan, 2019), *dplyr* (Version 0.8.0.1; Wickham, François,

76 Henry, & Müller, 2019), *papaja* (Version 0.1.0.9842; Aust & Barth, 2018), *pwr* (Version 1.2.2;

77 Champely, 2018), and *summarytools* (Version 0.9.2; Comtois, 2019) for all our analyses.

Histogram of baseline
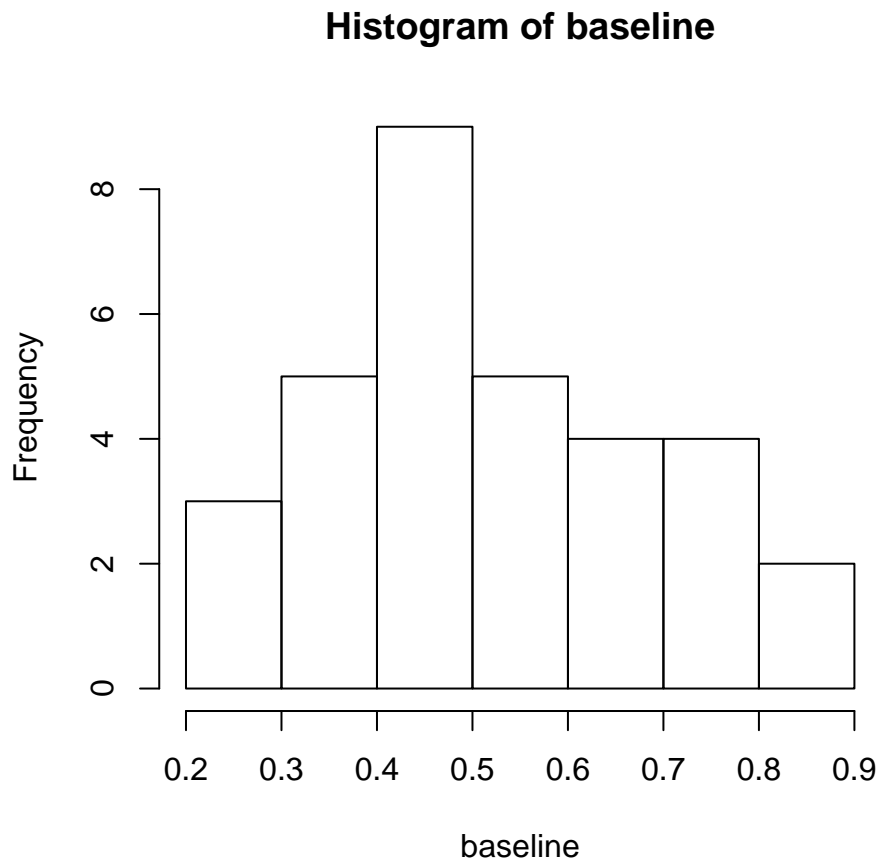
78   # Results

79 `## [1] 0.5210967`

80 `## [1] 0.1769651`

81   Mean proportion of time that infants looked at two strangers shows to be closer to

82 50/50

83 `##`

84 `##   One Sample t-test`

85 `##`

```
## data:  baseline
## t = 0.67438, df = 31, p-value = 0.5051
## alternative hypothesis: true mean is not equal to 0.5
## 95 percent confidence interval:
##  0.4572940 0.5848994
## sample estimates:
## mean of x
## 0.5210967
```

The mean proportion looking time toward the singing stranger during Experiment 1 was .52, and was not significantly different from .5 (50/50 chance), according to a one-sample test, $t(31) = .67$, $p = .505$.

Discussion

The re-analysis successfully reproduced the analysis reported by Mehr et al. (2016) In the following section, I show an example of completing a simulation based power analysis for this design.

Simulation-based power analysis

```
## Warning: package 'pwr' was built under R version 3.5.3

##
##      One-sample t test power calculation
##
##              n = 32
##              d = 0.54
##      sig.level = 0.05
##          power = 0.8410715
##    alternative = two.sided
```
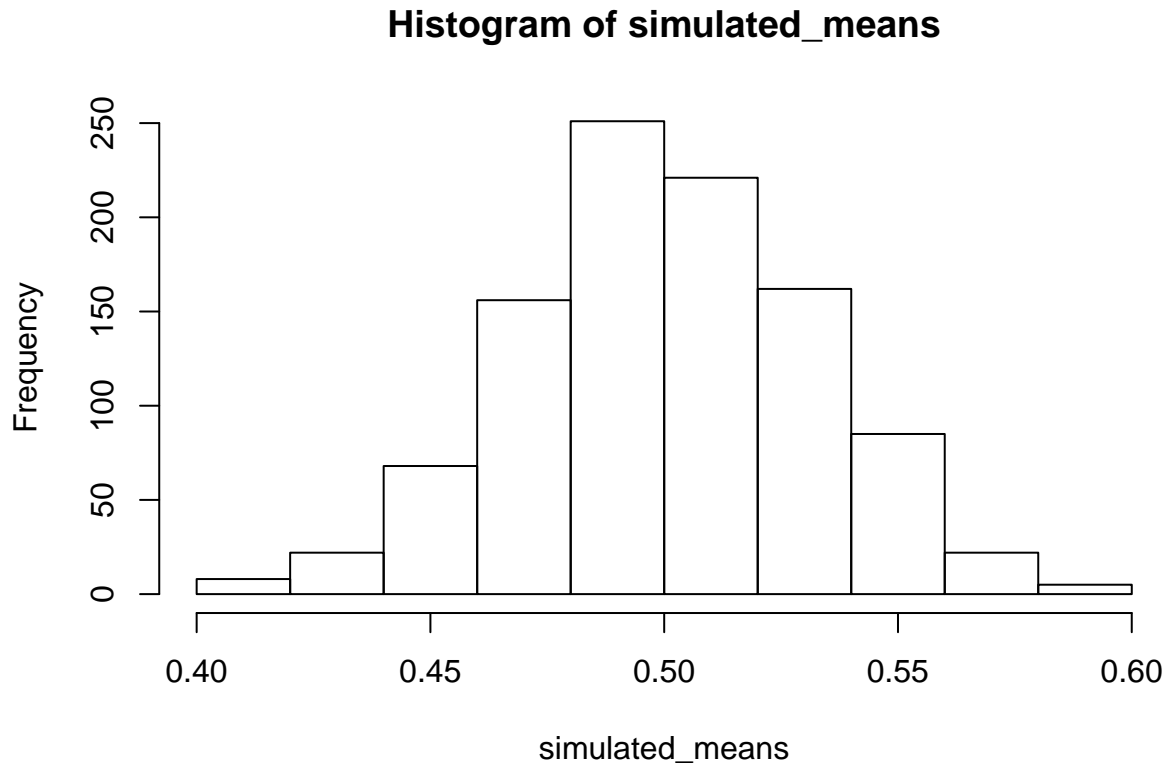
111   Power analysis has successfully confirmed the exact number of participants needed for

112   the Experiment 1

Histogram of simulated_means

113

References

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