

FACE POSE DISCRIMINATION PROJECT

Final paper COGs 160: Face Pose Discrimination Project

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Face pose discrimination project

Attention sharing is a critical skill for infants. It helps them learn and understand what is important in an environment (Bornstein & Tamis-LeMonda, 1997). In the project, we worked on the face pose discrimination paradigm. It plays an important role in the attention sharing skill. Some study suggests that infants will see more interesting sights if they can more precisely resolve caregivers' head pose (Butterworth & Cochran, 1980). Mostly, the face pose discrimination task is preceded by a habituation task, in order to habituate the infant to a familiar face. According to the *cognitive model*, visual habituation is defined as a decrement of attention to a repeatedly or continuously presented stimulus. Visual habituation alludes to basic information-processing skills (Kavsek, 2004).

Therefore the questions are: How, and why, study face pose discrimination is critical for infant development? How an infant uses caregivers' head poses to discriminate important information? When an infant is able to discriminate the difference between two faces?

Method

Participants

48 younger infants between 4-11 months ($n_{4m} = 30$, $n_{5m} = 31$, $n_{6M} = 38$, $n_{7m} = 43$, $n_{8m} = 42$, $n_{9m} = 45$, $n_{10m} = 39$ and $N_{11m} = 8$) were repeatedly tested. Their mothers accompanied them. Because of low sample size, data of 11 month-olds were eliminated.

Procedure

The procedure began by the habituation task. . In the study, infants were habituated to the same face. Left-Right orientation of face was counterbalanced across each month (face for 4 month = face looked at the left, for 5 month = right side...). The habituator was characterized by short looking times. In order to orient infants, a cue light appeared between each stimulus.

The second phase consisted to a presentation of two series of pairs of faces (the habituation face and the novel face). This task is known as face pose discrimination. We strongly presume for the moment that left-Right position of familiar face was counterbalanced randomly across the 2 trials. For instance, if the familiar face was presented randomly on the left for trial 1 (T1), the familiar face was presented on the right for trial 2 (T2) (see figure 1). In order to measure ability to discriminate different face poses, the method used the preferential looking time. Infant's looking preference (left or right) was coded by an observer who couldn't see the stimuli. He judged the infant's preference on each trial. The data was recorded on a computer. So, we recorded the amount of percentage of looking on the right or the left (and therefore, amount of percentage of looking familiar and novel face).

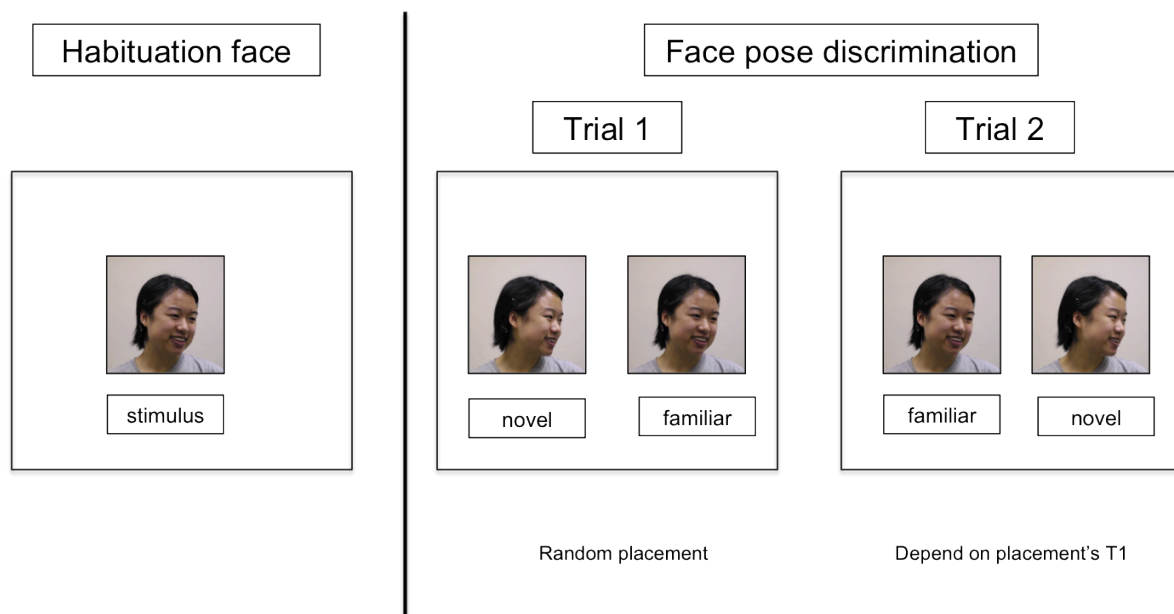


Figure 1. Experimental design

Note. During test phase 1, position of novel vs. familiar stimulus was randomized. Depending on test phase 1 positions, position order was reversed during test phase 2.

Results

At the moment of the quarter, we just finished some descriptive statistics about the difference of looking time percentage between Novel and Familiar face for T1 and T2. We calculated the difference of looking time percentage of familiar minus novel face.

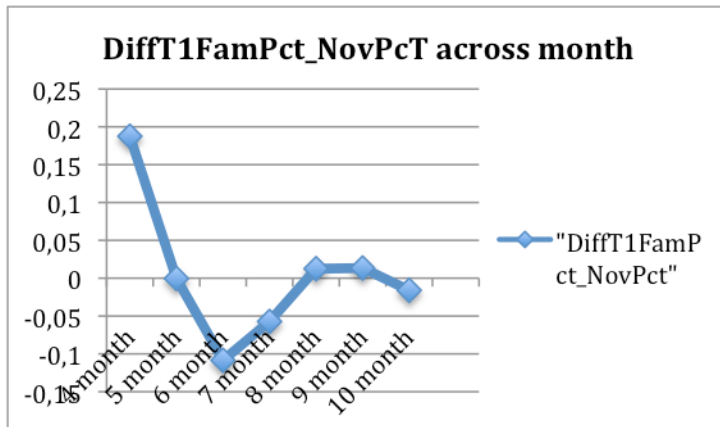
Difference of looking time percentage familiar minus novel face

Figure 2. The difference of looking time percentage familiar minus novel face for T1

Note. If the difference is positive, infants look more to the familiar face whereas if it negative they look more to the novel face.

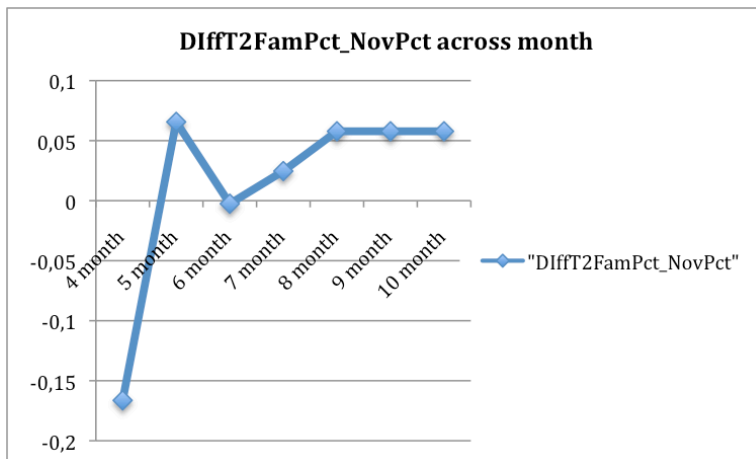


Figure 3. The difference of looking time percentage familiar minus novel face for T2

For the moment, the two graphics don't show a really meaningful preference for the familiar or novel face. We have to clean the data in order realize more specific analysis.

Difference of looking time percentage familiar minus novel face between T1 and T2

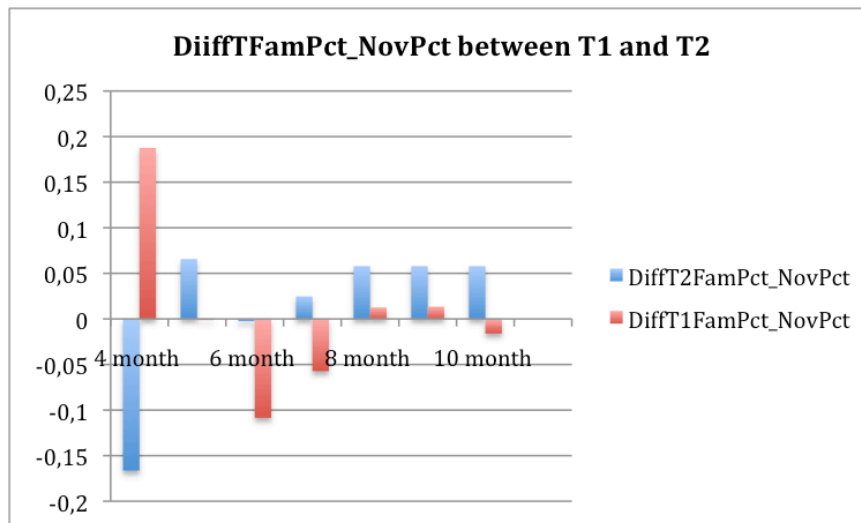


Figure 4. The difference of looking time percentage familiar minus novel between T1 and T2

Note. If the difference is positive infants look more to the familiar face (inversely correct).

According to the graphic, we can say that the difference between familiar and novel face is not really significant around the age of 7-10 months. But, we have to clean the data in order get some significant results. Because there is the inverse result for trial 1 and trial 2 whereas it is the same experiment (even though the left-right orientation face wasn't the same. We don't see a real logic across month).

Discussion

The article, *the developmental course of habituation in infancy and preschool outcome* (John Colombo, D. Jill Shaddy, 2004), was an interesting reading in that it realized a very similar experiment of our project. It was also a longitudinal study where infants were tested monthly on habituation task and novelty preference task (which is the same task of face pose discrimination). These two tasks didn't have a really great difference in term of procedure with our two tasks. But, there were two major differences. First, they recorded respiratory and cardiac measures in order to investigate different phases of attention that occur during looking time periods during

habituation sessions. And the second difference was the reliability part. Indeed, a second observer coded the habituation and novelty phase from videotape of session. It permitted to control the veracity of the online records. I just examined the paired comparison phase results part (because it is the important part for our project). So, the data suggested that infants' aged of 3 months had difficulty to discriminate novelty preference, but infants from 4 to 8 months showed a robust novelty preference. But, the 9 months preferred the familiar face. Therefore, it is important to investigate more precisely about development of face pose discrimination.

Conclusion

Study face pose discrimination in infants is important because the development of attention during infancy plays a critical role in the cognitive and language skills in their future development. So, if an infant is able to discriminate the differences between faces, it could be useful for later to deduce information for understanding the present situation. The measure in earlier cognition permits to improve the intellectual functions in childhood and adolescence. For instance, Colombo and Mitchell (1990) argued that variation in look duration is the primary factor that drives both individual and developmental differences in visual habituation during infancy.

The future tasks for the next quarter are to clean the data (in order to avoid some incoherent results and obtain coherent ones) and recode some videos offline to compare result with the online-recorded data (reliability part). Then, we can realize more precise statistic analysis of data and give rise to some conclusion.

During this quarter I learned new paradigms, methods, concepts about cognitive development in young infants. I read articles about face pose discrimination, habituation and deficits in infant's development. I learned also to use basic operation of SPSS in order to realize some statistic analysis. So, I read documentation and did the tutorial. Then, I learn how to structure a scientific article with the APA manual website tutorial.

References

- Colombo, J., Shaddy, D. J., Richman W. A., Maikranz J. M., Blaga, O. M., (2004). The developmental course of habituation in infancy and preschool outcome. *Infancy*, 5(1), 1-38.
- Deak, G. Project description MESA longitudinal study.
- Kavsek, M.,(2004). Predicting later IQ from infant visual habituation and dishabituation: A meta analysis. *Applied Developmental Psychology*, 25, 369-393.