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Does the Thatcher Effect Extend to Infant Faces?

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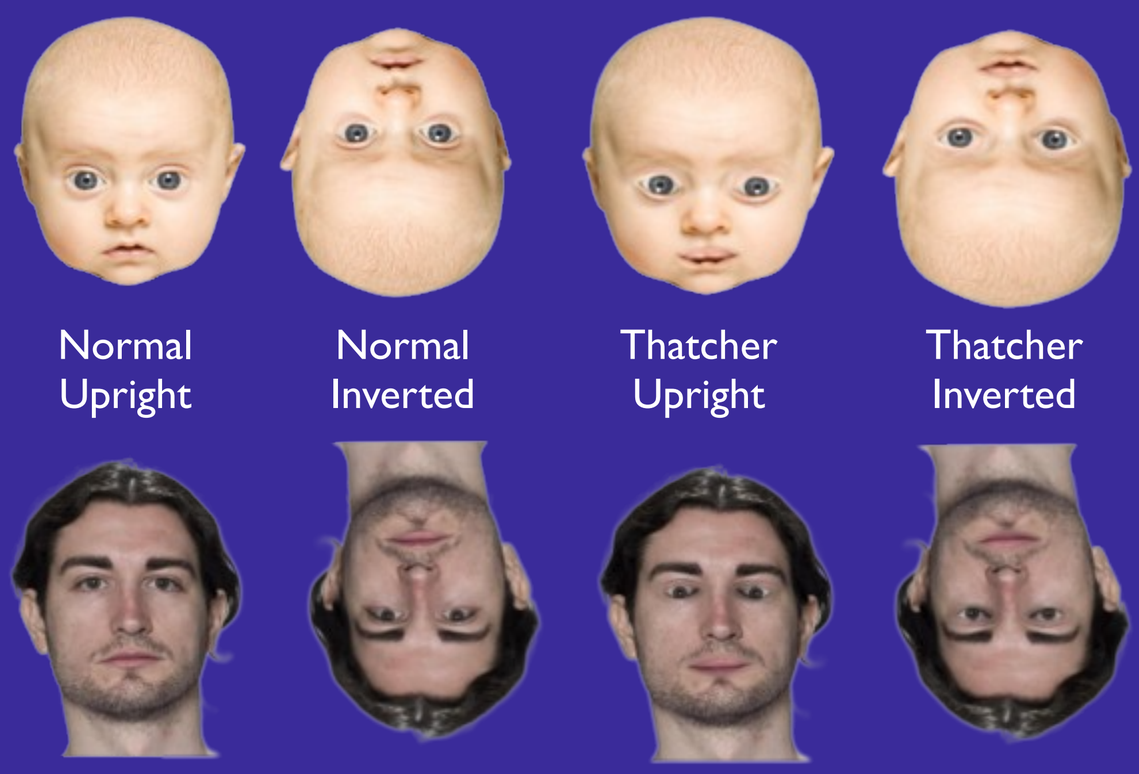
Background

You will spend more time looking at faces than any other type of object in your lifetime. Because faces are such an important social signal, humans have developed a perceptual expertise for faces. Decades of research on the mechanisms of face processing have demonstrated that although faces contain both featural and configural information humans rely more heavily on configural processing strategies when viewing faces[1]. However, this work has been done using almost exclusively adult facial stimuli. More recently, researchers have proposed that infant faces may elicit different neural activity and behavioral responses than do adult faces[2] suggesting that infant faces are not necessarily processed in the same way that adult faces are. Indeed, these observed differences may start at the very early stages of face processing (i.e., the structural encoding occurring within the first few hundred milliseconds of seeing a face). However, no studies have yet explored potential differences in processing strategies used for infant faces compared to adult faces. The current study uses a well-established configural disruption known as the Thatcher Effect (TE) to investigate the use of configural processing for infant faces. In s sample of ethnically diverse adults (N=119, 54% white, mean age = 23.3, SD = 7.1).

Methods

Normal and Thatcherized versions of 30 adult faces and 30 infant faces were viewed in the upright and inverted condition. Thatcherized versions of each face were created by rotating the eyes and mouth 180°. This manipulation is quite obvious in upright faces, but harder to detect when faces are inverted (because inversion disrupts configural processing). Participants rated how bizarre each face appeared on a 1 (not very bizarre) to 7 (very bizarre) scale. Thatcher Effect (TE) scores were calculated by subtracting the bizarreness rating for normal face from the Thatcherized version in each orientation. Bigger scores thus reflect greater configural disruption.

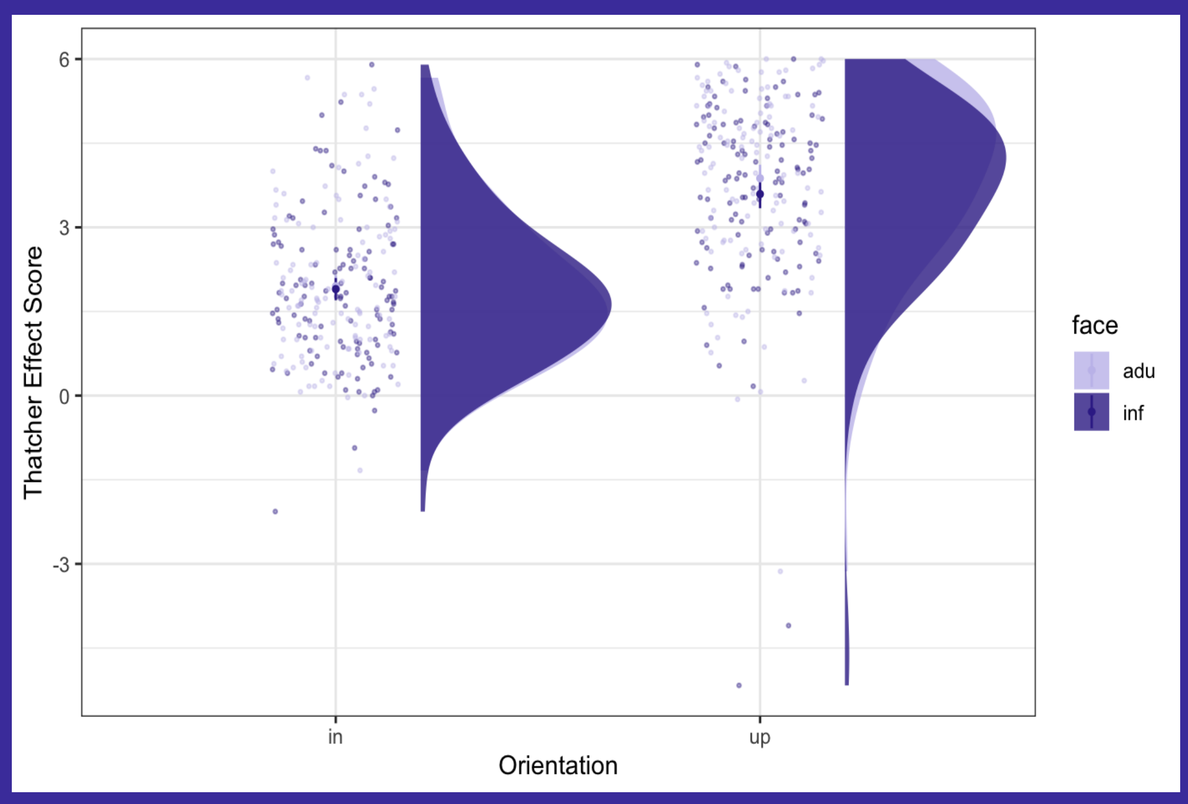


Analysis

A 2x2 repeated measures ANOVA was run using Thatcher Effect (TE) scores as the dependent variable. Face type (adult/infant) and orientation (upright/inverted) served as within-subject factors. Post-hoc Bonferroni-corrected t-tests were used to follow up.

Results

The interaction between face type and orientation was significant ($F(1,118)=5.12$, $p = .025$, $ges = .002$), indicating that the magnitude of the Thatcher Effect was greater for adult faces than infant faces in the upright, but not averted, orientation.



Discussion

Here we found that the Thatcher Effect was more apparent for upright faces than inverted faces, replicating the robust orientation-dependent nature of this manipulation[3] . We also found that the magnitude of the Thatcher Effect was larger for adult faces than infant faces in the upright condition. This indicates that the configural disruption caused by altering the spatial relationship among the facial features (i.e., the configural information of the face) had a greater impact on the perception of adult faces than infant faces. This suggests that we may be less reliant on configural processing for infant faces. Configural processing develops as a consequence of expertise[4] and many young adults may not have very much experience with infant faces, meaning they lack expertise with this specific face category. Indeed, expertise-based configural processing has been linked to the own-race bias[5] in face perception (i.e., we are better at individuating and remembering faces of our own ethnicity due to increased experience with such faces) and some recent work has suggested that infant faces may not be as susceptible to the own-race bias as adult faces are[5]. Together, these results suggest that infant faces are processed differently than adult faces. Additional research is needed to better understand infant-specific face processing mechanisms and how these might relate to caregiving behavior.

References

❶ Maurer (2002) ❷ Brosch (2007); Kringelbach (2008); Hodsoll (2010); Proverbio (2011). ❸ Bartlett & Searcy (1993) ❹ Gauthier & Tarr (1977) ❺ Meissner (2001); Tanaka (2004); Proverbio (2011, 2019; but see Hodsoll 2010)