Abstract: Infant preference for attractive faces has been a consistent finding across research. Evolutionarily, attractiveness identification has the duel purpose of avoiding dangerous people and finding a mate. Research has shown that infant preference is not particular to race, gender, age, or even potentially species. It can be seen that infants forms categories of attractive or unattractive based off processing of internal facial features. Reviewing these articles has demonstrated that infants show signs of an adaptive mechanism that allows for quick and accurate division of individuals into attractive or unattractive groups. This processing allows for judgment formation and individual identification. These findings give evidence to a preference mechanism that allows for the infant to react and interact with individuals differently, based off facial judgment. Some argue that this is a by-product of general prototype functioning, but inverse facial studies and analysis of infant exposure make this less likely.
Attractive Faces

Introduction and Theories

Evidence is robust in recent psychological research regarding the infant preference for attractive faces. Attractiveness is a trait that is acknowledged universally to be a desirable trait and even more so a trait that is telling of health and fitness. Research has shown that in adults, attractiveness is defined in many ways by a face’s similarity to the prototype created by finding the average of faces. Langlois and Roggman (1990) showed that a computer-generated face that was formed from several individual faces was judged to be significantly more attractive than any of the individual stimuli used to form that average (Buss, 148). This, and several other studies like it, shows the complex nature of the human prototype for an attractive face.

But to form an average requires exposure to many individuals, a processing of them visually, and cognitively forming a prototype. This is something that requires both significant time and experience, but also, mental capacity that infants may less equipped to handle than adults. The preference then that is seen in infants for attractive faces seems to be part of a bigger picture of facial learning and beauty recognition. From an evolutionary perspective, recognition of faces is incredibly crucial. For an infant to form an attachment bond with its caretaker, the infant needs to be able to distinguish one individual from another. This is a matter of safety (i.e. avoiding strangers) as well as protection for the infant. If an infant is incapable of identifying an untrustworthy individual and respond appropriately, such as cry when an unsafe person comes too close, the baby could come into harm’s way. Then, babies who were better suited to identify faces more quickly would have survived and thus the trait would have spread, leading to the adaptive mechanism seen today in infants.
Attractive Faces

Additionally, the attractive element is an interesting one. Adults should have a preference for attractive faces as a mate seeking mechanism. Attractive individuals have clear skin, symmetrical faces, bright eyes, etc. The signs of attractiveness are also signs of a lack of disease or deformity, good nutrition and hormone levels, and high levels of self-care. To mate with a person who is of high health means a better chance for the survival of the offspring, and thus the spreading of one’s own genetic code. To have a mechanism that allows for us to quickly identify and to prefer attractive faces is certainly advantageous for a sexually mature human. But for an infant, it is a little unclear.

This seemingly innate preference for attractiveness, due to how early its onset happens, seems to have an evolutionary basis. But like a preference for a certain age or WHR, it seems to be a preference that could just onset with puberty when it is useful. So why do we have this preference so early? What else does an attention for attractive faces do for us? Perhaps by exploring the research that answers the surrounding questions, we can establish a clearer picture of the nature of such a preference and then begin to theorize about its purpose and its origins from an evolutionary perspective. Several questions come to mind. How does the infants define attractiveness? Do children show a symmetry preference or an average face preference? Does the attractiveness of their primary caregivers have an influence on preferences? Do these preferences extend beyond adult faces into peer faces, computer generated faces and those of animals? Answering these questions lends light to the nature of the mechanism that allows for such learning, which could make clearer the history and use of such a preference.
Attractive Faces

In many ways the same reason an adult would need to be cognoscente of beauty are the same reasons an infant would need to be. As a sign of health, a baby is very susceptible to disease and illness that others may carry due to an under-developed immune system. Evidence for such a theory of face preference has been seen in adults. In a Shackelford and Larsen (1997) study, those individuals with symmetric faces had higher schools of health, both physical and mental (Buss, 112). Also, Johnson found in a study that those faces judged as healthiest by women were also just as the attractive faces (Buss, 113). In addition, as a sign of physical care, a person who is well-kept may be also more likely to treat the infant with care. Finally, if the baby can identify attractive people early, the baby can begin to smile, interact, and win the affection of the attractive members of society, thus setting him or herself up for inclusion and therefore potential future reproductive success. Research has also made clear that babies develop a fear of strangers around six months; roughly the same time research has shown an attractiveness preference to arise. Identifying attractive faces then is a task that had significant evolutionary pressure and would be a prime candidate for a task that could have easily become an adaptive mechanism.

Two theories dominate the thinking behind infant facial preference. These consider the potential benefits of a general or a specific mechanism. The cognitive theory believes that the specific focus on faces is just a subset of the processing mechanism used to create visual prototypes in general. The same one we use to form categories for fish or chairs is the same one we use to form categories of faces. This is not a strange concept, since it is a mechanism, which could very easily be adjusted to accommodate the necessary task of face recognition. But it seems that face recognition would be the
Attractive Faces

primary issue, the one with the greatest cost if not solved, and thus it seems the mechanism would evolve for the purpose of face cognition and then generalize for non-human faces or other objects. The cognitive theory focuses many on the idea that face preferences are part of a general mechanism for forming averages and creating prototypes, but not specifically forming attractive faces. It ignores the evolutionary advantages of face recognition and only highlights the cognitive processes responsible for their formation.

The evolutionary theory is much more encompassing, as it takes the cognitive theory and adds an understanding of why which a mechanism would come to be. The evolutionary theory states that a mechanism for preferring attractive faces over unattractive faces would develop as a result an evolutionary pressure to identify safe and healthy faces, avoid potential problems as well as mate finding strategies.

There is no clear answer as to whether this is an adaptive mechanism or a by-product of prototype processing. Literature around the topic has looked to find ways to tackle and resolve this issue. As our knowledge of the attractive face preference expands, the more complex this mechanism or by-product seems to be.

Internal vs. External Feature Analysis

In order to understand an infant’s processing of faces, an awareness of what the children actually see when a face is observed is crucial. Do children see the hair, the eyes, the mouth or a bit of everything when judging a face? Slater, Bremner, Johnson, Sherwood, Hayes, and Brown (2000) explored this processing by adjusting elements of a face stimulus. In this study, twenty-nine newborns were exposed to twelve female faces.
Attractive Faces

Half of these were judged by adults as attractive, the other half unattractive, with a statistically significant difference between the two groups. Researchers manipulated the external and internal features to form four categories, unattractive internal features (eyes, noses, mouth, etc.) and external features (hair, jaw, cheeks and ears), attractive in both category, or unattractive external with attractive internal, and vise versa. These four categories (defined as UU, AA, UA, and AU) were exposed to the new-borns in two conditions, either with the internal kept the same and the external changes, or with the internal changed and the external constant. The results of this study were telling. Infants displayed roughly an equal preference for the faces with the external change, implying that the difference did not make a difference in preference for the children. However, when the external was kept constant, the children looked at the attractive internal face longer than the unattractive, with a p-value of less that 0.01. This study provides two significant conclusions. First being that children do not solely focus on external features, as demonstrated by their indifference to the change. Also, it is clear that focus on the internal elements of faces is more important. The authors argue that the internal facial features give more relevant cues to attractiveness and mode than external. The authors also fall on the side of prototype learning, although due to the age of these infants (on average, less that 100 hours old), it would seem more likely to me that this is a special understanding of the importance of facial information. More research would need to be conducted looking at non-human facial stimuli.

Attractive and Unattractive Category Formation

Another question that arises is whether children are forming categories, distinguishing attractive as a group from unattractive as another. This would have
Attractive Faces

massive implication for the by-product camp, as it would provide evidence that clumping individuals together and are thus capable of finding an average. This also matters to the specific evolutionary mechanism also since categories would allow for quickly stereotype formation and therefore quicker judgment. In their 2004 paper, Ramsey, Langlois, Hoss, Rubenstein, and Griffin. This study combines four experiments, the first two defining infants ability to differentiate between different face types, and the last two examining whether or not children were able to distinguish between the individual faces at all. In experiment 1, forty-three six-month olds were exposed to fifteen photos rated by adults as unattractive. These faces were different, but all unattractive. Children were placed on their parents lap, with the parent’s view of the stimuli obscured, and presented with two images of a particular unattractive face. After the fifteen trials, children we exposed to two novel stimuli, one attractive and one unattractive. Looking time was recorded via a researcher. If the children had clumped the faces into a singular category, then it is thought the child should be bored of the previous stimuli and prefer the novel object in the other category, in this case the attractive face. Infants did demonstrate this preference. In experiment 2, the same procedure was run, but with a familiarization to attractive faces. Children in that case showed a preference for the unattractive face, supporting the idea that the infants are forming categories and not just preferring attractive faces always.

Experiments 3 and 4 look to rule out the idea that due to facial similarity among stimuli, infants are observing the 15 unique faces as one face. Due to the development of sight in six-month-olds, this check is reasonable. A similar procedure is utilized as above. The infants are familiarized to an unattractive or attractive face for 20 trials lasting 10
Attractive Faces

seconds. After this exposure, children are presented the same face or a novel face of the same category. In both conditions, children demonstrated a novelty preference.

The authors pose that this ability is due to similarity recognition and not individual characteristics. This allows for the formation of categories, after which one can form stereotypes of ideas about those categories (i.e. attractive people are more desirable, are safer, carry less diseases, etc.). This study demonstrates that children are indeed forming prototypes, as both camps believe, but the nature of why prototypes for faces are or are not special is still unresolved.

Preference for Attractive Baby Faces

Such arguments for the specialty of facial recognition and distinction start from an understanding of what kinds of faces elicit a beauty preference. So far, the previous studies have all used Caucasian adult women. This is indeed not representative of the entirety of faces to which children are exposed in their childhood. A Van Duuren, Kendell-Scott, and Stark (2003) study examined babies’ facial preferences for another common group: their peers. In addition, this study investigates the effect of inversion. If infants are simply forming prototypes based off lower level stimuli, then the inversion of that object, which leaves the parts the same but upside-down, should also yield the same preference. But first, a preference must be established.

In experiment 1, sixteen six-month olds were placed on his or her mother’s lap and presented stimuli on a projection screen obscured from the mother’s view. The infants were exposed to a paired stimulus for a set time of 10 seconds. On one side of the screen, there was an image of an unattractive baby as judged by adult raters. The other
side contained an image of an attractive infant. Their location was randomized to avoid side preference. Looking time was recorded via a researcher. Experiment 1 yielded no significant result, mostly due to the small set looking time.

Experiment 2 utilized the same procedure, but with an increased exposure time of 15 seconds. Now, significant results were found, with a preference for attractive baby faces over unattractive baby faces, the resulting p-value being less than 0.0001. When given the choice between two stimuli, six-month olds invest more time in observing the attractive infant.

The inversion test is used to eliminate the potential confound of general feature preference. As to be expected by a facial bias and not a configuration of lower-level processing bias, the attractive preference was not exhibited when the babies were flipped upside down. Utilizing the same procedure, infant looking times were roughly equal for the two groups.

The authors discuss the baby preference to refute the idea of a mate finding strategy for face preferences. Also, they do admit that facial beauty in an infant is based off of the same characteristics that define attractive adult faces. In addition, the idea of prototypes is again considered, but due to the similarity between infant and adult faces, with the addition of the inversion element, it seems unlikely that this is the result of a simple lower processing mechanism but rather specialized for faces, allowing infants to recognize potential caregivers, as well as happy, healthy babies, as they may also be signs of potential caregivers. But the question is still in the air as to whether these preferences are the result of the caregiver’s attractiveness or facial features. This study also only used
Attractive Faces

Caucasian babies and mostly Caucasian participants, which could hint to a simple self-preference. A study investigating faces of different cultures or analyzing the parental attractiveness would shed more light on the topic.

Facial Diversity

A Langlois, Ritter, Roggman, and Vaughn (1991) study revealed that neither age, gender, race or parent beauty has an impact on an infant’s attractiveness preference. Similar to previous studies, Langlois et al. utilized a paired-stimulus paradigm, exposing children to an unattractive and attractive face. In the first experiment, children were presented either two male faces or two female faces in each trial. Looking time was recorded via a researcher. Results showed that infants preferred attractive faces regardless of sex. Experiment two, utilizing the same procedure but replacing all the faces of those of African Americans, yielded the same results. Color did not influence the attractive distinction, showing that infants look for a universal set of features rather than just those specific to their own experience or race. Study three simply replicated the results of the Van Duuren et al. study that investigated infant faces. Additional analysis was done of the attractiveness of the mothers, whose pictures were taken before testing. Adult analysis categorized them into either attractive or unattractive groups, but this too had no influence on the child’s results.

This study shows that the processing of faces is a deep one, able to be generalized beyond personal experience, due to the similarity of facial features across cultures. A face of a different culture still matches the infant’s understanding of a face, with certain internal features and beauty markers. Both our understanding of category formation and
Attractive Faces

averages supports this. The authors argue for an understanding of averages that relies on an evolutionary backing, namely that an average face has the best ability to withstand diseases or have mutations. Therefore culturally an average face should be preferred, regardless of skin tone or age. This concept utilizes a mechanism that is able to identify common facial features and form preferential judgments about them.

Non-human Beauty Preferences

To investigate the question of a mate-choice mechanism, Quinn, Kelly, Lee, Pascalis, and Slater (2008) looked specifically at infant processing of cat faces. In experiment 1, children were exposed to images of house cats in the same paired-stimuli paradigm as before. Researchers coded looking time. Infants were brought into the lab by their parents, sat on their laps and observed two stimuli, one attractive and one unattractive house cat, as rated by adult judges. Data analysis revealed a preference of attractive cats. This result stood up to the inversion test in experiment 2. While this demonstrates that children may show a preference for attractive faces of other species, house cats are bred to resemble the preferences of adults, and thus could be a biased sample.

To counteract this human selection bias, researchers conducted the same study with wild cats. Children were exposed to pairs of tiger, lion, panther, etc., one attractive and one unattractive as judged by adults. Again a preference for attractive faces was shown. In experiment 4, a habituation paradigm was used to eliminate the chance that infants may not be making physical distinctions. Similar to the categorization study, infants were exposed to either all attractive tigers. If these tigers were categorized
Attractive Faces

together, then the child should build a novelty preference for unattractive faces. This was
indeed the case.

The authors utilized these results to demonstrate that infants are actually using a
generalized prototype forming mechanism. If it were a mate preference mechanism, then
it should not have an effect on our observations of species with which we cannot mate.
This theory however does not seem so pretty with the added knowledge that the judgment
criteria for beautiful cats are based off of a human interpretation of beauty, which is still
based off processing of the human face. Thus the attractiveness ratings still represent a
preference for certain beautiful human features, and could easily still represent a mate-
finding tactic. That being said, when combined with previous evidence, it does seem
likely that the extension to other creatures could merely be a result of facial similarity
across mammals (eyes, mouths, noses, etc). Mate-finding and caregiver identification
have a lot of evolutionary pressure. Early on in our development, this would have needed
to be something to distinguish for safety and survival. Thus it may be safe to say that this
trait could have developed much earlier than many of our current human-specific
features. Little research has been done to see if infants exhibit the same preferences as
animals of that species. This could be done by taking pictures of males that are alphas or
of high sexual status as opposed to those left out of mating, instead of relying on human
judgment of animal beauty.

Conclusions

While there are still many questions to be answered, the literature forms a
cohesive story. Infants have an innate or very early onset preference for attractive faces,
Attractive Faces

regardless of age, nationality, gender, or maybe even species. Children are defining attractiveness by forming categories based on internal feature similarity. All this study lends evidence towards an adaptive mechanism that assists in facial processing. Individuals are able to quickly form categories and make assumptions about a face based on little previous input and a general understanding of facial construction. The preference for internal features may demonstrate an understanding of where to find the crucial information about a face, although it could also just be the more interesting, more compact feature. Additionally, the inversion studies rule out a lower-level-processing conclusion. Generally, it seems that identifying attractive faces has a very clear evolutionary purpose and solves a necessary problem faced by our ancestors. These studies eliminate age, gender and culture as potential causes, allowing for the face as a structure to be the center of processing.

Future research should aim at an understanding of the scope that this mechanism takes as well as what particular assumptions children are making about attractive or unattractive faces. It seems that understanding of facial processing could start as simple as a few dots and lines in the right places. But specifically from an evolutionary perspective, things like emotion, smiling versus not smiling, should make a different to a child’s preference. Also, no study has looked at specific feature selection. A study that took the same attractive face and manipulated nose size or eye distance to find the prototypical face for infants would reveal a lot more about the structure of this mechanism cognitively. Perhaps children are simply looking for certain elements in certain places, regardless of how those pieces work together to form a cohesive unit. More study would need to be done to understand the nature of what defines beauty for
Attractive Faces

infants. Much study has been done for adults, but with infants this becomes more tricky, because communication is limited.

Infants’ preference for attractive faces may solve many adaptive problems. Its early onset and its complexity make it a potential useful tool for an infant’s survival. Study as to its use in stranger avoidance tactics or caregiver identification could continue to expand our understanding of this feature of children’s development as an adaptive mechanism capable of increased survival chances.
Bibliography


