# How Our Desire for Social Information Affects Tastes in Paintings and Belief Systems

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**Abstract**

Psychology has found a many explanations for what makes art compelling. People can also find that belief systems, such as religions or health ideas, resonate with them. We know that how much people feel positive about ideas influences their actual endorsement of those ideas. We show that the depiction of human beings positively affects both art and belief. Experiment 1 shows that in paintings around the world, depictions of people dominate. Experiment 2 shows that for alien abduction theory, the look of the bald "grey" alien has features that we use to indicate intelligence in human beings: being tall, and having a small nose. This supports the theory that we find art and belief systems compelling for the same reasons.

**Keywords:** art; alien abduction; belief systems; aesthetics; psychology; perceptions of intelligence; social reasoning.

## Introduction

The appeal of visual images of human beings seems intuitive, but why would this be? According to the social compellingness theory (Davies, 2014), it is because our minds have evolved to be particularly interested in human affairs.

Human beings have lived in hierarchical social environments for a long time. Exactly how long is debated, but most agree that we have lived in cooperative groups since, at least, the dawn of agriculture 10,000 years ago, and probably longer (Haidt, 2012). Human beings have been, and continue to be, a social species. One's survival and reproduction, then and now, depends on maintaining a network of social relationships and social knowledge about the social milieu one lives in. Other people are necessary for our prosperity, but are also our greatest rivals and enemies. The resulting hyperactive sensitivity to anything to do with people known variously as "the hypertrophy of social cognition" (Boyer, 2003), "agenticity" (Shermer, 2011), "anthropomorphism" (Guthrie, 1993), "overactive theory of mind" (Bering, 2011), and the "hypersensitive agency detection device" (Haidt, 2012).

We see people where there aren't any, as when we see faces in mountainsides, but rarely do we see mountainsides in faces. The evolutionary explanation offered for this effect is that the cost of missing seeing a person is greater than the cost of mistaking something inanimate for a person. Indeed, there is a region of the neocortex, called the fusiform face area that might be specifically evolved for facial recognition (Kanwisher, McDermott, & Chun, 1997).

We are also very quick to ascribe intentionality to events, rightly or wrongly. For example, cultures worldwide tend to attribute sickness to curses cast by other people (Boyer, 2001, p. 169).

Whatever it is called, what is clear is that we have a great interest in the affairs of people. We actively seek information about them, and are more interested in something if it has to do with people. As such, it is no surprise that depictions of human beings dominate the visual arts.

It is also striking that religions worldwide involve beliefs in supernatural agents that resemble people in their basic psychology. Gods, spirits, and ghosts have desires, beliefs, and goals. According to the social compellingness theory, our desire to understand and attend to matters of human or humanlike social interaction means that a particular stimulus will be more compelling if it features people and social interactions, whether that stimulus is a work of art, such as a painting, or a belief system, such as astrology.

In this paper, we present two experiments intended to show how depictions of person-like entities make both art and belief systems more compelling. Experiment 1 is a survey of world art, in which the number of people in each work of art was counted. Experiment 2 takes a popular paranormal belief, that people have been abducted by intelligent aliens, and shows how our interpretation of alien anatomy mirrors our beliefs about human beings in terms of perceived intelligence.

## Experiment 1

Social compellingness theory predicts that depictions of human beings, as opposed to, say, other animals or objects, should dominate popular art. This is not a surprising prediction, but no survey has been done to determine the *extent* to which this is true. In the current study a survey of artistic images was conducted to count the number of people in every image in a typical art history textbook. Social compellingness theory predicts that there will be a great deal of images of people, so as a comparison, the number of non-human animals (hereafter "animals") were also counted.

## Method

A then-undergraduate named Rebecca Frerotte conducted the survey. She was a third-year undergraduate in art history. She was not informed of the hypothesis of the study until after the data were collected.

Frerotte chose a representative art history textbook, *Art Past Art Present* by David G. Wilkins, Bernard Schultz, and Katheryn M. Linduff (2008). This book was chosen for its selection of art in terms of its breadth in history and geography. The book contained works of art in various media, including paintings, drawings, and sculpture.

For each artistic image in the book, where applicable, Frerotte recorded the following information: 1) the Figure number, 2) the number of people depicted, 3) the number of non-human animals depicted, 4) the period of movement to which the art belongs, 4) the medium, and 5) the geographical origin of the image. This survey took her approximately 15 hours to complete.

Images in the book that were deemed to be *not* visual art, such as maps, schematic sketches, or architecture were not counted. In total there were 432 artistic images, many of them paintings, referred to hereafter simply as "images."

One difficulty was the occasional inability to clearly view the artwork or art object portrayed in the reproduction. Also in many cases only details (subsections) of artworks were shown. In paintings where there were depictions of statues as well as humans, only those figures depicted which appear to be intended as persons (or very human-like beings such as angels) were counted as human. So, for example, if an interior scene featured a wall on which was painted children, those children were not counted as human for the purposes of this study.

The first hypothesis was that there would be more images with humans in them than images without. The second hypothesis was that there would be more images depicting humans than other animals.

### Results and Discussion

Of the 432 images in the book, only 95 had no people depicted (22.9%), as opposed to the 337 that featured at least one person (78%). There are over three times as many images with people in them than not. This supports the first hypothesis, that images with people outnumber images without. Figure 1 shows a histogram of the number of people in the images.

Depictions of people were much more common than depictions of animals. Of the 432 images in the book, 332 had no animals depicted. 42 had one animal, 15 had two animals, 10 had four animals, 5 images had six animals, 4 images had seven animals, and all other counts of animals were displayed in no more than one or two paintings. The maximum number of animals in a single image was 52. The second hypothesis was also supported, in that 76% of the images had no animals, while only 21% of the images had no people.

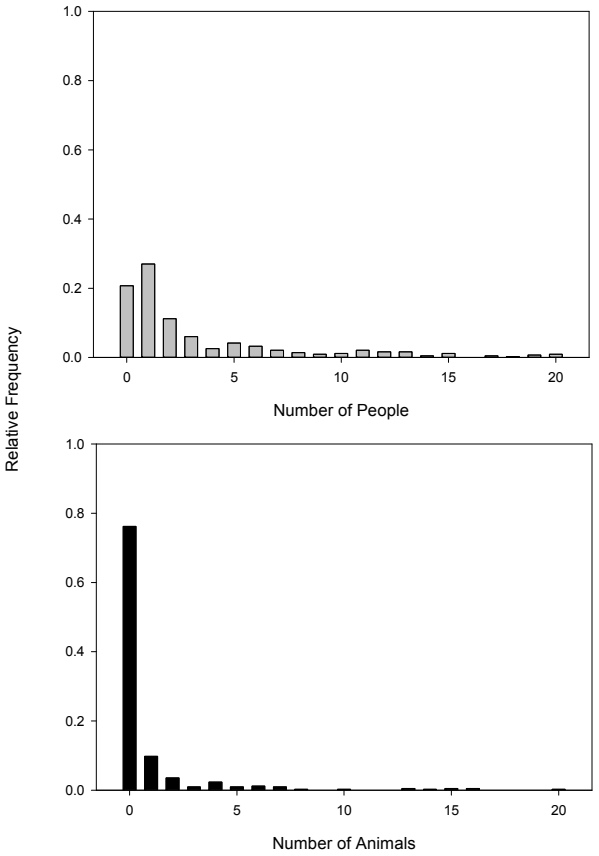


Figure 1: Relative frequency histograms of the 432 images according to how many people (top) and animals (bottom) were found in them. For clarity, the x-axis stops at 20 but some images had a higher number of people

The results were not affected by historical period. We compared the 1500s, Baroque, and Renaissance periods because they were the movements which were associated with the largest numbers of paintings (respectively 31, 29, and 21).

The data also reveal that low numbers of people (and animals) are more common than high numbers. This tendency might be explained by the fact that small numbers of people are more conducive to interaction, particularly conversation. The maximum group size for conversation has been estimated to be about five (Dunbar, 1993). It could be that small numbers of people feel more comfortable for us, resulting in our preference for art depicting small groups.

Our study is limited in that the book tends to depict famous works of art, rather than a representative sample of *all* art created. We hope future research will explore these hypotheses with more representative data sets. That said, given that we are interested in compelling art, the most famous works might be the best to measure.

## Experiment 2

Many people believe that aliens have visited our planet and interacted with human beings. One of the most popularly believed-in alien types is the "grey," a relatively short, hairless humanoid with big, slanted eyes and a small nose (see Figure 2 for a depiction). Though science has discredited this "extraterrestrial hypothesis" (EH) and the existence of the greys, the fact that people continue to believe in them is an interesting puzzle.

Novella (2000) argues that it could be the physical appearance of extraterrestrials as portrayed in the media that affects the intelligence we attribute to them. Is it possible that the grey alien portrayed in the media is an exaggeration of the physical features that we attribute to perceived human intelligence or do people believe them intelligent merely because we associate them as being interstellar travelers?

Experiment 2 explores the idea that the greys' physical appearance has evolved (through cultural evolution) to look smarter by accumulating exaggerated features that humans judge as intelligent. If this is true, then if the greys were portrayed with different physical characteristics, people would perceive them to be less intelligent.

What features contribute to perceptions of intelligence?

If the appearance of an extraterrestrial is a peak shift of features, an effect seen when a human or animal has a heightened response to an exaggerated stimulus, that make humans appear intelligent (Ramachandran & Hirstein, 1999), then understanding which features contribute to the extraterrestrials' perceived intelligence will suggest which features affect our judgments of other humans. Specifically we will focus on how three features (nose size, eye size, and height) affect an individual's perception of intelligence.

Hsiao and Cottrell (2008) looked at facial recognition and found that the nose, or slightly to the left of the nose, is the first physical feature we attend to. Because of this and the fact that we judge the intelligence of a person in the first 39 milliseconds of seeing them (Bar, Neta, & Linz, 2006), it is reasonable to conjecture that the nose might play into our perception of a person's assumed intelligence. In Experiment 2 we test what size of nose makes the extraterrestrial appear more intelligent. We hypothesize that a big nose intuitively makes an alien appear less intelligent.

Because people with larger eyes are perceived as more intelligent than those with smaller eyes (Paunonen, Sampo, Ewan, Earthy, Lefave, & Goldberg, 1999) we hypothesize that an alien depicted with larger eyes will be judged as more intelligent than one depicted with smaller eyes.

Height is a characteristic of genetic fitness in humans, and a fitter mate is viewed as more intelligent (Miller, 2000). In one study, taller women are seen as more intelligent than shorter women by both male and female participants (Chu & Geary, 2005). We assume from this study that taller men are also seen as more intelligent than shorter men, although this has not yet been tested directly. Studies also show that there is a correlation between height and *actual* intelligence; one suggested explanation for this is that better nutrition plays a role in both higher intelligence and increased height (Case & Paxson, 2006). Thus we hypothesize that a tall extraterrestrial will be perceived as more intelligent than a shorter extraterrestrial.

Overall, we hypothesize that one or more of the physical characteristics of how greys are reported to appear, such as eye size, nose size, and height, contributes to our perceiving them as intelligent. To test this, participants looked look at images of extraterrestrials and rated their intelligence. All of the images were similar to each other, with at least one variable manipulated per stimulus presented. We predicted a main effect of tall, large eyes, small nose, and that features such as short, small eyes, and large nose would be negatively associated with perceptions of intelligence. As well, the general "intelligent features" extraterrestrial will be seen as the most intelligent, and the "unintelligent features" extraterrestrial will be seen as the least intelligent.

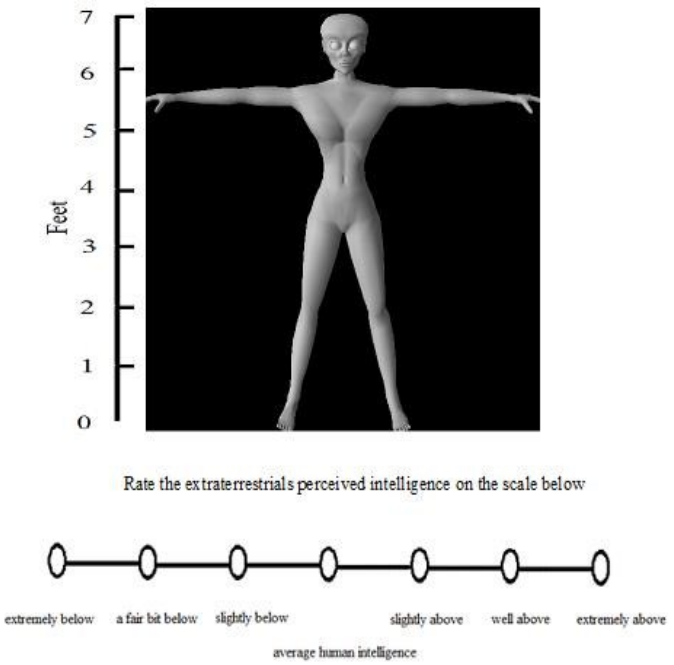


Figure 2: This figure displays an example of one of the pages shown to participants.

### Method

36 participants were recruited for this experiment. Participants were either Carleton University students or were recruited through personal contact. Participants had normal or corrected to normal vision. 15 participants were male and 18 were female, and the gender of 3 was unaccounted for.

Computer generated images of extraterrestrials were generated using a piece of software called Creature Creator Pro. Images were presented on paper along with a 7 point scale. Each question used a 7 point scale in order to rate the perceived intelligence of the stimuli, 1 being "extremely below" and 7 "extremely above". See Figure 2 for an example of a question participants would have seen.

There were 9 different stimuli created for the experiment. Refer to Table 1 for the feature combinations of a specific stimulus.

*Table 1*. This table shows the given feature combinations for a specific stimulus. Each row represents a different stimulus and its determined feature combinations.

| Stimulus Name | Height | Nose | Eyes |
|---|---|---|---|
| Average | A | A | A |
| Intelligent Features | Tall | Small | Large |
| Unintelligent Features | Short | Large | Small |
| Tall | Tall | A | A |
| Short | Short | A | A |
| Large Nose | A | Large | A |
| Small Nose | A | Small | A |
| Large Eyes | A | A | Large |
| Small Eyes | A | A | Small |

A = average

The stimuli were printed on sheets of paper, with one stimulus, question and scale per page. This was done to discourage direct comparison of one stimulus to the others. The order of the images was randomized for each package.

Participants were instructed verbally and in writing to look at each image and determine the perceived intelligence of the stimuli. Six different forms of a question appeared for each stimulus type. Variations of the word "smart," such as smart, intelligent, bright, and logical were used (refer to Table 2 for all question variations).

## Results and Discussion

Test of reliability were run on all stimulus types (for example, the Tall stimulus, or the Large Nosed stimulus) for all of the questions asked. In all cases Cronbach's alpha was at least 75% (**α**= 0.75) or higher. See Table 2. For all ANOVAs run in this experiment, there was no main effect of question ($p$>0.05), as well there was no main effect for the interaction between the stimuli being tested and the questions asked ($p$>0.05).

Overall it was found that participants judge the intelligence of different stimuli differently ($F(3.2) = 3.84$, $p < 0.05$). The physical features of the stimuli affected their perceived intelligence. A 9 (Stimuli) x 6 (Question) Repeated measures ANOVA was run. Mauchly's test of sphericity reached significance. Consequently, results for this ANOVA are reported using the Greenhouse-Geisser corrected test. Figure 2 shows the judged intelligence ratings given to the stimuli averaged across participants and the questions asked.

Four 2 (Stimuli) x 6 (Question) repeated measures ANOVAs were run to compare each stimulus feature.

Table 2 shows that the Tall stimulus was rated as significantly more intelligent than the Short stimulus ($F(1) = 6.97$, $p < 0.05$, $\eta_p^2=0.17$).

Smaller nose size also increased the judged intelligence of the stimuli ($F(1) = 6.20$, $p < 0.05$, $\eta_p^2=0.15$). Difference in eye size did not affect the judged intelligence of the stimuli found ($F(1) = 1.15$, $p > 0.05$, $\eta_p^2= 0.034$). It is possible our experiment did not have enough power to detect an effect.

*Table 2*: Results. This table reports the mean and standard deviation for each of the 9 stimuli, averaged across all participants and all 6 questions. It also reports the reliability measure, reported as Cronbach's alpha, for the questions asked for a given stimulus, averaged across all participants. *SD refers to Standard Deviation.

| Stimuli Name | Mean | SD* | Cronbach's alpha |
|---|---|---|---|
| Average | 4.89 | 0.13 | 0.80 |
| Intelligent Features | 4.74 | 0.17 | 0.89 |
| Unintelligent Features | 4.19 | 0.24 | 0.92 |
| Tall | 4.85 | 0.13 | 0.75 |
| Short | 4.32 | 0.21 | 0.89 |
| Large Nose | 4.42 | 0.19 | 0.89 |
| Small Nose | 4.71 | 0.15 | 0.83 |
| Large Eyes | 4.62 | 0.18 | 0.91 |
| Small Eyes | 4.79 | 0.15 | 0.79 |

The Intelligent Features stimulus was judged to be more intelligent looking than the Unintelligent Features stimulus ($F(1) = 4.80$, $p < 0.05$, $\eta_p^2= 0.12$).

Overall there was a correlation between the physical features of the extraterrestrial images and their perceived intelligence. We found that being tall and having a small nose contributed to increased perceptions of intelligence. Though the differences for eye size were in the hypothesized direction, there was no significance.

We found that certain physical features predict increased intelligence judgments in stimuli depicting alien beings. In general, the features that had an effect are consistent with previous work on perceptions of intelligence, as well as the idea that we base some ideas of intelligence on neoteny, or looking child-like.

Specifically, we found that higher intelligence was perceived in aliens depicted as being tall and having a small nose. Our hypothesized overall "intelligent alien" (tall, big eyes, small nose) was also perceived to be more intelligent than our hypothesized "unintelligent alien" (short, big nose, small eyes.)

These features, we suggest, are a peak shift (Ramachandran & Hirstein, 2010), or are supernormal stimuli (Barrett, 2010) for intelligence in humans. That is, we suggest that the look of the grey works as a cultural myth because the physical features of the greys are exaggerations of what function as cues for intelligence in human beings. Suggested aliens that do not conform to these tendencies we have would not gain the widespread acceptance that the greys do.

Our finding is consistent with the theory that neoteny predicts intelligence and intelligence judgments. When a species is called neotenous when there are fewer physical

differences between juveniles and adults. Across primates, the more intelligent a species is, the less an individual changes during development. Humans are more neotenous than gorillas because we look more like babies than adult gorillas look like infant gorillas. Neoteny probably happens because the species develops more slowly than other species and retains many of its juvenile characteristics (Choi, 2009). Davies (2014) proposes that neoteny is also tied to perceptions of intelligence. One explanation for the relationship between intelligence and a youthful appearance is that a major part of being intelligent is having the ability to learn. In general, the young are better learners than adults. Fluid intelligence peaks in young adulthood and declines from then on (Lee, et al., 2005). Younger brains are more flexible, more plastic. Neoteny might be the result of evolutionary pressure that resulted in slowed development—that is, we stay young longer by aging more slowly. Indeed, this is probably what happened over thousands of years to turn wild dogs into domestic dogs (Morey, 1992).

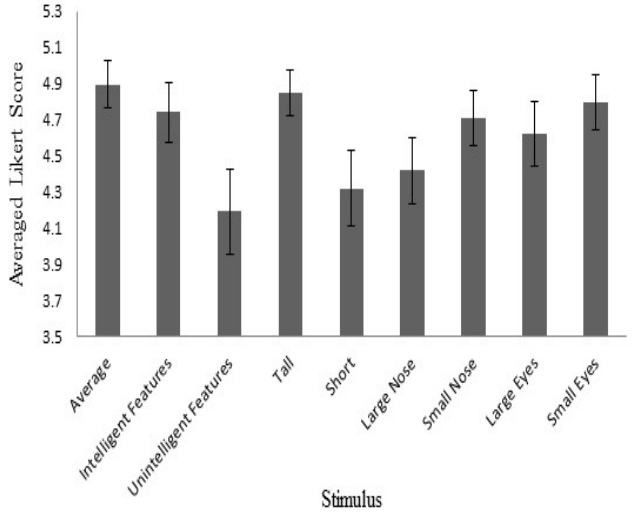


Figure 3: Judged intelligence ratings. Scores were averaged across participants and question versions. The score is the intelligence rating given. Bars represent

It could be that humans domesticated themselves, by sexual selection, as we chose less and less violent mates, and by societies killing off their most violent people. This theory is described in Pinker (2011). Contemporary hunter-gatherer societies tend to kill off ten percent of their male population. The very young are more playful and less violent. By selecting for non-violence, societies been selecting for slowed development. Slowed development might have caused a host of changes, including a decrease in violence, looking more childlike, and greater intelligence. This might be currently happening with bonobos, a kind of chimpanzee (McAuliffe, 2010).

Baby-faced individuals are characterized as having small noses and large eyes (Zebrowitz, Fellous, Mignault, & Andreoletti, 2003). While the Intelligent Features stimulus was tall, it also had large eyes and a small nose. The unintelligent Features stimulus only had one neotenous feature.

Our failure to find that larger eyes predicts intelligence judgents goes against the results found by Paunonen et al. (1999). It was originally thought that large eyes would be consistent with higher ratings of intelligence based on the findings by Paunonen et al. (1999). The findings are consistent with Zebrowitz & Montepare (1992) however. The Large Eyed stimulus used in this study had large eyes, a large cranium, and a small chin. It could be that participants thought the Large Eyed stimulus, when coupled with these other features, looked intellectually naïve. Zebrowitz & Montepare (1992) found similar results when they had individuals rate baby-faced adults on various measures, such as degree of naivety.

It was not found to be case that the overall intelligent looking stimulus, the extraterrestrial that was tall, had large eyes and a small nose, was judged as the significantly most intelligent stimuli, the converse is also true. The extraterrestrial that had all of the determined unintelligent features, short, had small eyes and a large nose, was not judged as the significantly least intelligent of all the stimuli. Perhaps with more participants the data could reach significance.

In one way the typical grey alien does not conform to the results we found here. Although we found that tallness predicted perceptions of intelligence, and this has also been found for stimuli of humans as well (Chu & Geary, 2005), the typical grey in the alien abduction narrative is not particularly tall—about the height of the average human woman (Malmstrom & Coffman, 1979).

Another feature of greys that we did not explore in this study is their baldness. Preliminary evidence suggests that bald men are perceived to be more intelligent than men with hair (Judg.me Blog, 2012).

Future experiments should look at fewer features, but in more depth. This experiment does not contain all of the possible combinations of features and thus does not show reactions to all possible effects or interactions. Looking at fewer features with all possible combinations could refine these results further.

## Conclusion

As animals that evolved in societies, we have a penchant for depictions and descriptions of people and social interactions and relationships. According to the social compellingness theory, all else being equal, stimuli that feature social information will be more compelling. In this paper we have described how this tendency manifests itself in art and in belief systems. Experiment 1 showed that most visual art features human beings.

In one popular belief system, alien abduction, humanoid creatures are said to be abducting people. Although we might focus on how aliens differ from human beings, the similarities are striking, from biology to motivation. Experiment 2 showed that we attribute intelligence to these supposedly space-faring beings using some of the same cues we use for predicting intelligence in our fellow human beings. This supports the idea that aliens are viewed, at least

in part, as people. We argue that this contributes to the compellingness of the Extraterrestrial Hypothesis. The idea that a short, fat, hairy alien with a big nose would be intelligent enough to build spaceships would strike the public as implausible due to their prejudices and the cues they use to determine intelligence. Aliens that *look* intelligent are more compelling because they fit the narrative better.

This work supports the "compellingness foundations theory," as explicated in Davies (2014), which holds that we find works of art and belief systems compelling for the same reasons. Future empirical work will further test this idea.

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