Can Cinderella become Snow White? The influence of perceived trustworthiness on the mental representation of faces

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People often infer others' social traits, such as trustworthiness, from a glance at their face. Whereas previous studies have focused on how different facial cues influence social perception, the present study examined whether perception of a person's trustworthiness could influence mental representations of that person's face, as well as the mechanisms underlying this process.

Two experiments were conducted. Experiment 1 was designed to test whether a target person described as trustworthy would be represented in the perceiver's mind as more attractive than the same person described as untrustworthy. One hundred and fifty-five participants were recruited and randomly assigned into four conditions (Female trustworthy: $N = 37$, 20 females, *Mean age* = 19.86 years, $SD = 1.60$ years; Female untrustworthy: $N = 38$, 21 females, *Mean age* = 20.42 years, $SD = 1.95$ years; Male trustworthy: $N = 40$, 20 females, *Mean age* = 20.38 years, $SD = 1.35$ years; Male untrustworthy: $N = 40$, 20 females, *Mean age* = 19.68 years, $SD = 1.82$ years). Participants were instructed to form an impression about a target person's trustworthiness by viewing the person's face paired with a description labeling them as trustworthy or untrustworthy. The reverse correlation image classification (RCIC) technique was then used to visualize the participants' mental representations of the target person's face (Figure 1). A separate group of participants ($N = 50$, 27 females, *Mean age* = 21.32 years, $SD = 2.51$ years) were recruited to evaluate the attractiveness and other traits (e.g., friendly, intelligent, and positive) of the generated mental representation images. Experiment 2 aimed to determine a possible underlying mechanism by exploring whether the mental representations of the trustworthy (or untrustworthy) target persons' faces in Experiment 1 shared more similarities with those of the trustworthy (or untrustworthy) faces at a group level (i.e., prototypes of trustworthy or untrustworthy faces). To achieve this goal, we recruited participants ($N = 20$, 10 females, *Mean age* = 19.95 years, $SD = 1.10$ years) to complete an alternate RCIC task in which they selected which of two faces appeared more trustworthy, producing mental representation images for trustworthy and untrustworthy faces at a group level (Figure 2). The features of these prototypical trustworthy and untrustworthy faces were then compared with those of the target person from Experiment 1.
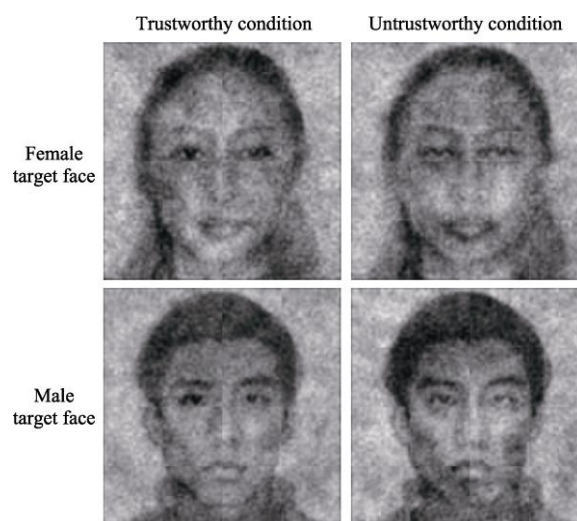

Figure 1. Classification images of female and male target faces in trustworthy and untrustworthy conditions.

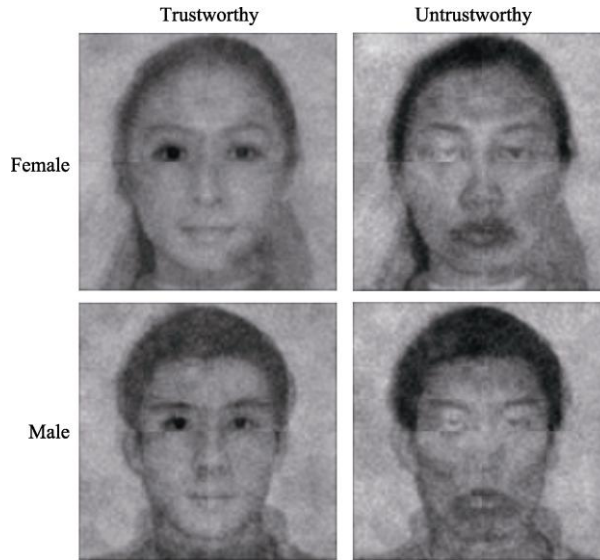|	Trustworthy	Untrustworthy
Female		
Male		

Figure 2. Classification images of the trustworthy and the untrustworthy faces at the group level (i.e., prototypes of trustworthy or untrust-worthy faces) in Experiment 2.

In Experiment 1, mental representations of a face described as trustworthy were found to be more attractive than those of the same face described as untrustworthy. Furthermore, raters attributed additional desirable traits, such as friendly, intelligent, and positive, to the representation of the trustworthy person (Table 1). In Experiment 2, we found that the mental representation of the face labeled as trustworthy in Experiment 1 shared more similarities with the prototypical trustworthy face produced in Experiment 2 than with the prototypical untrustworthy face (Table 2).

Table 1
Numbers (percentage) of raters (50 in total) chose the classification images from the trustworthy condition for different traits

Trait	Female face	χ^2	Male face	χ^2
Attractive	49 (98%)	46.08***	49 (98%)	46.08***
Intelligent	43 (86%)	25.92***	43 (86%)	25.92***
Trustworthy	49 (98%)	46.08***	50 (100%)	50.00***
Positive Expression	49 (98%)	46.08***	47 (94%)	38.72***
Friendly	49 (98%)	46.08***	49 (98%)	46.08***
Mean	10 (20%)	18.00***	4 (8%)	35.28***
Greedy	6 (12%)	28.88***	5 (10%)	32.00***
Aggressive	6 (12%)	28.88***	8 (16%)	23.12***
Dominant	17 (34%)	5.12*	16 (32%)	6.48*

Note. *** $p < 0.001$; **$p < 0.01$; * $p < 0.05$.

Table 2
Correlation coefficients and corresponding 95% confidence intervals between different Classification Images (CI).

Group	Prototypical trustworthy CI	Prototypical untrustworthy CI	Difference in correlation coefficients	Difference between correlations (95% confidence interval)
Male				
Trustworthy person's CI	0.45 [0.44 0.45]	−0.17 [−0.18 −0.16]	0.62***	[0.61 0.62]
Untrustworthy person's CI	0.03 [0.02 0.04]	0.23 [0.22 0.24]	−0.20***	[−0.21 −0.20]
Female				
Trustworthy person's CI	0.51 [0.51 0.52]	−0.26 [−0.27 −0.25]	0.77***	[0.77 0.78]
Untrustworthy person's CI	0.23 [0.23 0.24]	0.05 [0.04 0.06]	0.19***	[0.18 0.19]

Note. Permutation test was used to test the difference between correlation coefficients.

In sum, our findings suggest that the perception of a person's trustworthiness can influence mental representations of that person's face. When people perceive an individual as trustworthy (or untrustworthy), they may superimpose the corresponding schema features in their minds onto the physical characteristics of the perceived individual's face, leading to a reconfiguration of the face representation. Our study underscores the importance of top-down factors in shaping face representations.

Keywords   person perception, reverse correlation image classification technique, mental representation, attractiveness, trustworthiness