What Is Typical Is Good: The Influence of Face Typicality on Perceived Trustworthiness

Carmel Sofer[1,2], Ron Dotsch[2,3], Daniel H. J. Wigboldus[2], and Alexander Todorov[1,2]

[1]Department of Psychology, Princeton University; [2]Behavioural Science Institute, Radboud University Nijmegen; and [3]Department of Psychology, Utrecht University

Abstract
The role of face typicality in face recognition is well established, but it is unclear whether face typicality is important for face evaluation. Prior studies have focused mainly on typicality's influence on attractiveness, although recent studies have cast doubt on its importance for attractiveness judgments. Here, we argue that face typicality is an important factor for social perception because it affects trustworthiness judgments, which approximate the basic evaluation of faces. This effect has been overlooked because trustworthiness and attractiveness judgments have a high level of shared variance for most face samples. We show that for a continuum of faces that vary on a typicality-attractiveness dimension, trustworthiness judgments peak around the typical face. In contrast, perceived attractiveness increases monotonically past the typical face, as faces become more like the most attractive face. These findings suggest that face typicality is an important determinant of face evaluation.

Face typicality is important for face recognition (Bartlett, Hurry, & Thorley, 1984; Rhodes, Brennan, & Carey, 1987) and for the mind's representation of face identity (Valentine, 1991). The highly studied norm-based face-space model (Valentine, 1991) posits that the typical, or average, face maintains a special status because it is extracted from faces previously seen and because it serves as a standard against which all faces are evaluated; in this model, all faces are represented as vectors originating from the typical face.

However, whether face typicality is important for face evaluation is unclear. Prior studies have focused primarily on the relationship between face typicality and attractiveness (e.g., DeBruine, Jones, Unger, Little, & Feinberg, 2007; Langlois, Roggman, & Musselman, 1994; Perrett, May, & Yoshikawa, 1994; Said & Todorov, 2011). In a pioneering study, Langlois and Roggman (1990) found that the digital average of 32 faces was perceived as more attractive than subsets of these faces and almost all the individual constituent faces. They interpreted this as indicating that, in general, an average face is the most attractive face. A meta-analysis subsequently confirmed a medium to large effect of face typicality on attractiveness judgments (Rhodes, 2006).

Other findings, however, cast doubt on the importance of typicality for attractiveness. Perrett et al. (1994) found that the digital average of a set of 60 female faces (the typical face) was judged as less attractive than the average of the 15 most attractive faces from the same set. Similarly, DeBruine et al. (2007) found that the judged attractiveness of face composites varying on a typicality-attractiveness dimension with the typical face located at the midpoint increased from the unattractive face to the

Corresponding Author:
Carmel Sofer, Behavioural Science Institute, Radboud University–Psychology, P. O. Box 9104, 6500 HE Nijmegen, The Netherlands
E-mail: c.sofer@psych.ru.nl

typical face and then continued to increase as faces became more like the attractive face. Recently, Said and Todorov (2011) developed a model that predicts a face's attractiveness from its position in a multidimensional face space. They found that the most attractive faces were close to the typical face on some dimensions, but far from the typical face on others.

Seemingly, these findings indicate that the value of face typicality for face evaluation may be smaller than previously thought. However, we argue that face typicality is an important determinant of face evaluation and affects trustworthiness judgments. We focus on trustworthiness judgments because they approximate general face evaluations. For example, in a principal component analysis of social judgments of faces, trustworthiness judgments were extremely highly correlated with the first principal component, which typically accounts for 60% of the variance and models evaluation (Oosterhof & Todorov, 2008). Given the relationships among typicality, familiarity, and positive affect, we expect that typicality affects trustworthiness judgments.

Typicality predicts the familiarity of objects from non-face categories (e.g., birds, automobiles; Halberstadt & Rhodes, 2003), and familiarity enhances positive affect toward objects (Lee, 2001). Face processing is no different. Bartlett et al. (1984) found that for never-before-seen faces, the perceived familiarity of typical faces was greater than that of atypical faces. In a study complementing these findings, Zebrowitz, Bronstad, and Lee (2007) found that familiar faces were liked more and were judged to be safer (i.e., more trustworthy and less hostile) than unfamiliar faces. Taken together, these findings suggest that perceived trustworthiness is influenced by face typicality. Recently, Todorov, Olivola, Dotsch, and Mende-Siedlecki (in press) found that perceived trustworthiness decreased as the distance of computer-generated faces from the typical face increased, even though the faces' dimensions (cues) were designed to be orthogonal (in the statistical face space) to the trustworthiness dimension. Interestingly, Galton (1883), who invented composite photography (the predecessor of modern morphing techniques), argued that every nation has its own typical face, which can be derived from averaging enough representative faces, and that this typical face represents the ideal face of the nation. Galton's insight suggests that this "ideal" (typical) face, perhaps the most consensually familiar face in a population, can serve as an important standard for the evaluation of novel faces. Presumably, atypical faces in a population—those that are distant from the ideal face—would be evaluated more negatively than the ideal—typical—face.

In three experiments, we tested the influence of a face's distance from the typical face (DFT) on observers' perception of the face's trustworthiness and attractiveness. To dissociate attractiveness and trustworthiness judgments in Experiment 1, we used a typical face and an attractive composite to create a range of face transforms. We expected that trustworthiness and attractiveness judgments would follow different trends, although ordinarily they are aligned. As the faces became more like the typical face, we anticipated trustworthiness judgments to follow a positive trend but attractiveness judgments to follow a negative trend. The purpose of Experiment 2 was to test a wider range of faces, ranging from attractive to unattractive composites, with the typical face located at the midpoint. We expected that trustworthiness judgments would be highest around the typical face. In contrast, we expected perceived attractiveness to increase past the typical face on the continuum, as the faces became more like the attractive composite. Finally, in Experiment 3, we verified that the findings of Experiments 1 and 2 were neither an artifact of face-selection bias nor a result of the face transformation process used.

Experiment 1

Method

Participants. Forty-eight female students (22–33 years old, $M = 22.4$ years) from the Hebrew University of Jerusalem participated in this online experiment. They participated from their homes at their own pace, within a predefined period of 3 weeks, and received course credit.

Stimuli. The stimuli consisted of a typical face (Fig. 1a) and an attractive composite face (Fig. 1b) plus 9 transforms created from them. The transformation process was executed such that a percentage (from 0% to 100% in increments of 10%) of the difference in shape and reflectance between the typical face and the attractive composite face was added to the typical face. This process resulted in 11 faces that varied from 0% typicality (100% attractive composite) to 100% typicality (0% attractive composite). The typical face was developed by a digital averaging process (PsychoMorph Version 5; Tiddeman, Burt, & Perrett, 2001) of 92 faces that were representative of the experiment's sampled population. Participants whose images were used varied in age from 23 to 31 years old. All of the original 92 faces were marked with 180 corresponding points. Averaging the shape and reflectance information in the faces resulted in a new face that looked realistic. The attractive composite face resulted from digitally averaging the 12 most attractive female faces in Winston, O'Doherty, Kilner, Perrett, and Dolan's (2007) face set. It represents a highly attractive face exemplar in the sampled (diverse and multicultural) population of the present study, which comprises people from different parts of the world, many of them from Europe and the United States.
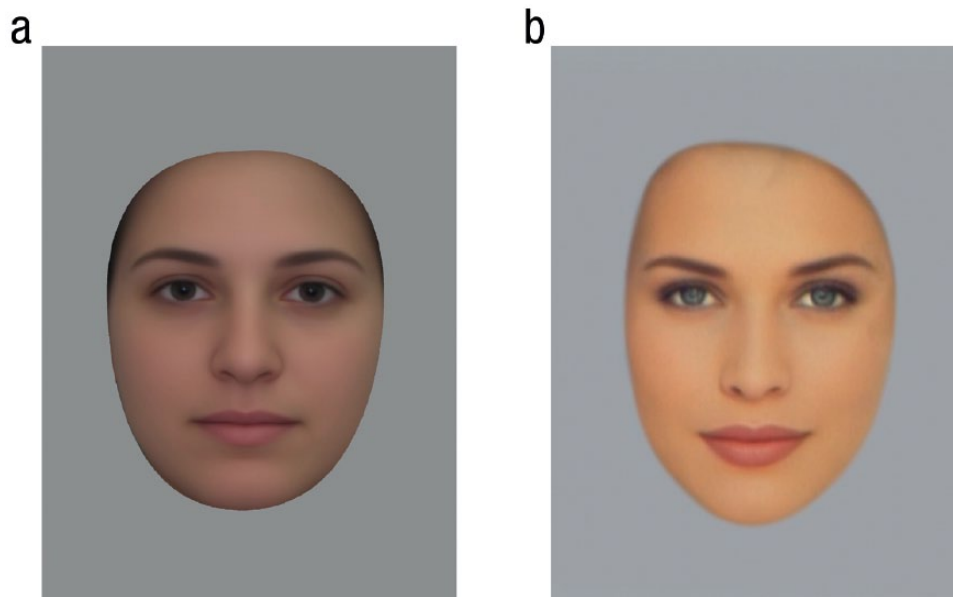
Fig. 1. The (a) typical and (b) attractive composite faces used in Experiment 1. The typical face was created by digitally averaging 92 female faces that were representative for the experimental participants. The attractive composite was created by digitally averaging the 12 most attractive female faces in Winston, O'Doherty, Kilner, Perrett, and Dolan's (2007) face set.

Design and procedure. Participants were asked to judge the faces on either trustworthiness (n = 24) or attractiveness (n = 24), using 9-point scales ranging from 1 (*definitely not* [trait]) to 9 (*definitely* [trait]). Assignment to the two conditions was random. Participants judged the full set of 11 faces three times. The faces were presented in three blocks, in random order within each block. Following earlier work (e.g., DeBruine et al., 2007; Perrett et al., 1994) testing the influence of face typicality on perceived attractiveness, we used female faces as stimuli. Because men and women perceive feminized faces differently (Rhodes, Hickford, & Jeffery, 2000), cross-gender judgments can add noise to the data. In order to reduce such possible noise, we chose, a priori, to use only female judges.

Results

For both trustworthiness and attractiveness judgments, we averaged the three judgments of each face for each participant.[1] Cronbach's alphas indicated high reliability for both trustworthiness (.88) and attractiveness (.97) judgments. Figure 2 shows the average trustworthiness and attractiveness judgments as a function of DFT. As predicted, as the faces became more like the typical face, trustworthiness judgments followed a positive trend, whereas attractiveness judgments followed a negative trend.

These results were confirmed in a multiple regression analysis in which we predicted the judgments using DFT, DFT-squared, judgment type (trustworthiness = 1,

attractiveness = 0), and their interactions (all predictors centered), $F(5, 16) = 285.81$, $p < .001$, $R^2 = .99$. On average, trustworthiness judgments were lower than attractiveness judgments, as revealed by the significant effect of judgment type, $\beta = -0.26$, $p < .001$. More important, the significant effect of DFT, $\beta = 2.27$, $p < .001$, revealed that DFT influenced attractiveness judgments, such that the more distant faces were from the typical face, the more attractive they were judged. In addition, we observed a significant quadratic effect of DFT on attractiveness judgments, $\beta = -1.09$, $p < .001$; the effect of DFT became weaker at higher values of DFT. Critically, the interactions between DFT and judgment type, $\beta = -1.54$, $p < .001$, and between DFT-squared and judgment type, $\beta = 0.34$, $p < .03$, indicated that trustworthiness and attractiveness judgments followed different trends as a function of DFT and that the more distant the face from the typical face, the less trustworthy it was judged.

We complemented our by-face analysis with a by-participant repeated measures analysis of variance (ANOVA) with DFT as a repeated measure and judgment type (trustworthiness vs. attractiveness) as a between-subjects factor. The observed effects supported the same conclusions as the by-face analysis. The main effect of DFT was significant, $F(10, 37) = 4.05$, $p < .001$, $\eta_p^2 = .52$.[2] More important, this main effect was qualified by a significant interaction, $F(10, 37) = 5.95$, $p < .001$, $\eta_p^2 = .62$. Separate follow-up ANOVAs for trustworthiness and attractiveness judgments showed that DFT had both a linear and a quadratic effect on trustworthiness, $F(1, 23) =$
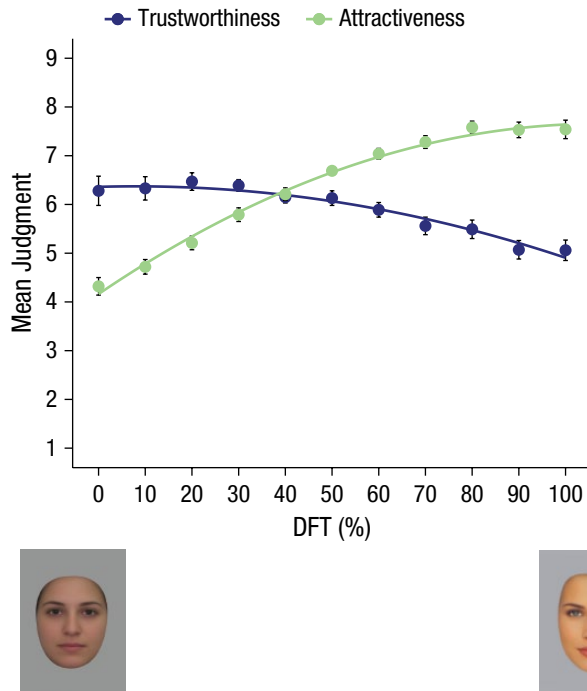
Fig. 2. Results from Experiment 1: mean trustworthiness and attractiveness judgments as a function of distance of the face from the typical face (DFT). Error bars (some too short to be seen here) represent within-subjects standard errors calculated in accordance with Cousineau (2005).

8.08, $p < .01$, $\eta_p^2 = .26$, and $F(1, 23) = 7.30$, $p < .05$, $\eta_p^2 = .24$, respectively. This was also the case for attractiveness judgments, although the linear component, $F(1, 23) = 102.60$, $p < .001$, $\eta_p^2 = .82$, was much stronger than the quadratic component, $F(1, 23) = 22.06$, $p < .001$, $\eta_p^2 = .49$.

Experiment 2

Experiment 1 provided evidence for a negative trend in trustworthiness judgments as faces become less typical and more attractive and an opposite trend in attractiveness judgments. However, it is possible that the typical face is not the point where trustworthiness judgments peak. It is conceivable that perceived trustworthiness continues to increase along the face continuum past the typical face in the direction toward more unattractive face composites. Attractiveness judgments were previously found to follow such a linear trend past the typical face, albeit in the opposite direction on the continuum (DeBruine et al., 2007). However, if face typicality is indeed an important determinant of perceived trustworthiness, as we hypothesized, then increasing DFT in the negative or the positive direction should decrease perceived trustworthiness. In Experiment 2, we tested this hypothesis by employing faces with a wider range of typicality (−100% DFT through +100% DFT).

Method

Participants. Fifty-three female students (18–30 years old, $M = 24.3$ years) from Hebrew University of Jerusalem and from Tel Aviv University participated in this online experiment, within a predefined time period of 3 weeks, for course credit or payment.

Stimuli. The stimuli consisted of a typical face (DFT = 0%) and an attractive composite face (DFT = +100%) plus 9 transforms created from them. The transformation process was executed such that a percentage (varying between 0% and 100% in increments of 20%) of the difference in shape and reflectance between the typical face and attractive composite face was either added to or subtracted from the typical face (Fig. 3). This process resulted in 11 faces that ranged from an unattractive face (DFT = −100%) to an attractive face (DFT = +100%). In order to increase the dissociation between perception of trustworthiness and perception of attractiveness, we created the attractive composite face by averaging the 5 most attractive faces in the face set of Winston et al. (2007). Given prior findings (Perrett et al., 1994), averaging the 5 most attractive faces (not 12, as in Experiment 1) should increase the perceived attractiveness of the attractive composite face and hence increase its perceived atypicality. We used the same typical face as in Experiment 1, but normalized its reflectance before executing the transformation process, in order to avoid extreme differences in reflectance between the faces at the two ends of the continuum.

Procedure. Experiment 2 repeated the procedure of Experiment 1. Faces were judged on either trustworthiness ($n = 27$) or attractiveness ($n = 26$).

Results

As in the previous experiment, we averaged the three judgments of each face for each participant except in one case, in which only two judgments were averaged because of a technical issue that resulted in an incorrect data point (11). Cronbach's alphas for trustworthiness and attractiveness judgments were .92 and .95, respectively. Figure 4 shows the average trustworthiness and attractiveness judgments of the faces as a function of DFT. As expected, the typical face was judged as most trustworthy. In contrast, attractiveness judgments kept increasing along the continuum past the typical face toward the attractive composite. These results were confirmed in a multiple regression analysis in which we predicted the judgments using DFT, DFT-squared, judgment type (trustworthiness = 1, attractiveness = 0), and their interactions (all predictors centered), $F(5, 16) = 133.2$, $p <$
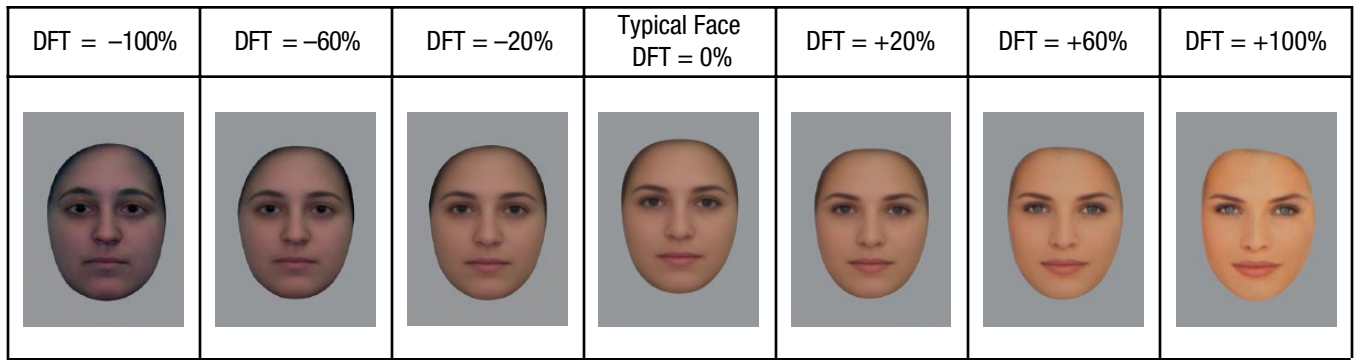
DFT = −100%	DFT = −60%	DFT = −20%	Typical Face DFT = 0%	DFT = +20%	DFT = +60%	DFT = +100%

Fig. 3. Examples of the stimuli used in Experiment 2. The face transforms in this experiment were created by adding or subtracting a percentage of the difference in shape and reflectance between a typical face and an attractive composite face. Thus, the typical face was at the midpoint of the continuum, and the endpoints of the continuum were an unattractive composite face (difference from the typical face, or DFT = −100%) and the attractive composite face (DFT = +100%).

.001, R^2 = .98. DFT, β = 1.32, $p < .001$; DFT-squared, β = −0.23, $p < .001$; and the interaction between DFT and judgment type, β = −0.86, $p < .001$, were significant predictors. These results indicated that trustworthiness and attractiveness judgments followed different trends as a function of DFT.

In order to find the predicted DFT where perceived trustworthiness reached a maximum, we fitted a quadratic model using the Levenberg-Marquardt algorithm for nonlinear curve fitting (Levenberg, 1944) to the mean trustworthiness judgments. The predicted DFT for the peak of trustworthiness judgments was 2.7%, very close to the typical face. We similarly fitted a model to the mean attractiveness judgments, although it was less optimized for a linear fitting. The predicted DFT for the attractiveness peak was outside the tested range of this experiment, an additional indication that attractiveness judgments included a highly linear component within the testing range of the study. The predicted location of the attractiveness peak is in line with the results of DeBruine et al. (2007), who found that perceived attractiveness reached its maximum at a DFT of 150% and then started to decline.

We complemented our by-face analysis with a by-participant repeated measures ANOVA with DFT as a repeated measure and judgment type (trustworthiness vs. attractiveness) as a between-subjects factor. The observed effects supported the same conclusions as the by-face analysis. The main effect of DFT was significant, $F(10, 42) = 15.74$, $p < .001$, $\eta_p^2 = .79$ (see note 2), unlike the main effect of judgment type, $F(1, 51) = 0.22$, $p > .60$, $\eta_p^2 = .005$. The main effect was qualified by a significant interaction, $F(10, 42) = 5.36$, $p < .001$, $\eta_p^2 = .56$. A separate follow-up analysis for trustworthiness judgments showed that the quadratic effect of DFT was significant, $F(1, 26) = 32.13$, $p < .001$, $\eta_p^2 = .56$, but the linear effect was not, $F(1, 26) = 0.63$, $p > .43$, $\eta_p^2 = .02$. In contrast, for attractiveness judgments, there was a strong linear effect,

$F(1, 25) = 225.36$, $p < .001$, $\eta_p^2 = .90$, and a much weaker quadratic effect, $F(1, 25) = 18.29$, $p < .001$, $\eta_p^2 = .42$. These results support our prediction that face typicality differentially influences trustworthiness and attractiveness judgments.

Experiment 2 provided further evidence that face typicality is an important determinant of perceived trustworthiness and that the typical face is indeed perceived as the most trustworthy. Trustworthiness judgments followed a
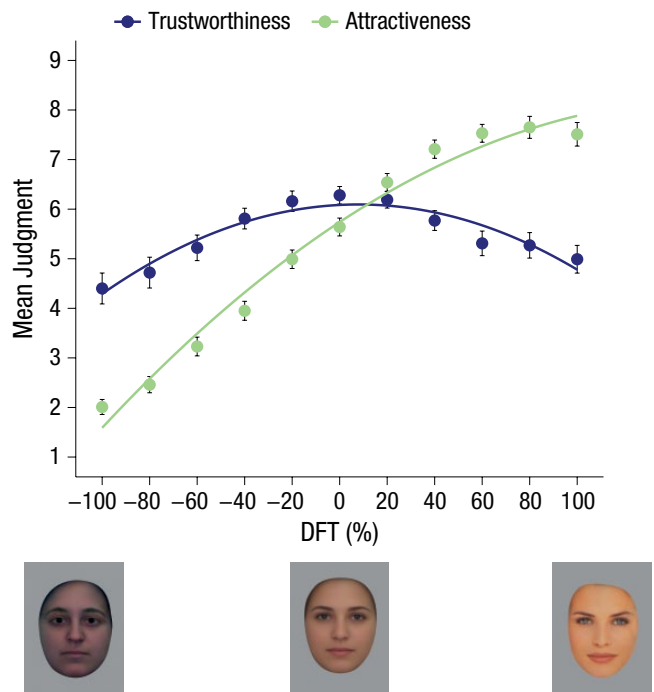

Fig. 4. Results from Experiment 2: mean trustworthiness and attractiveness judgments as a function of distance of the face from the typical face (DFT). Error bars represent within-subjects standard errors calculated in accordance with Cousineau (2005).

quadratic trend, reaching a maximum around the typical face. Attractiveness judgments, in contrast, had a strong linear trend and a weaker quadratic component; the typical face was simply another point on the attractiveness continuum.

Experiment 3

It is possible that the findings of Experiment 2 are an artifact of using composite faces (the attractive composite and the typical face) that were derived from different face sets. Although the attractive composite represented a highly attractive exemplar in the sampled (diverse multicultural) population, our participants may have perceived it as uncommonly attractive, not completely neutral in expression, or lighter in color than the other faces. It is also possible that our findings are an artifact of the transformation process itself. In our transformation procedure, which was adopted from previous studies (e.g., DeBruine et al., 2007; Langlois & Roggman, 1990; Perrett et al., 1994), faces located at DFTs of 0% (typical face) and 100% (attractive composite) were the source faces from which the face transforms were created. Therefore, the face stimuli at those distances were kept in their original forms and were not transformed. In contrast, all other face stimuli underwent a transformation process. For example, the face composite at −100% DFT was the extrapolated result of subtracting from the typical face the difference between it and the attractive composite. This procedure created a transformation asymmetry between the faces located at DFTs of −100% and +100% (not transformed). This asymmetry may have influenced both trustworthiness and attractiveness judgments. In Experiment 3, we addressed both issues by using a different composite face. Specifically, we used a composite of unattractive faces from the set of faces representative of the experimental population (i.e., the same set used to create the typical face). The direction of the transformation was thus opposite to the direction of the transformation in Experiment 2.

Method

Participants. Sixty-seven female students (21–34 years old, *M* = 24.9 years) from the Hebrew University of Jerusalem and from Tel Aviv University participated in this online experiment, within a predefined time period of 3 weeks, for course credit or payment.

Stimuli. The stimuli consisted of an unattractive composite face (DFT = −100%) and the typical face (DFT = 0%) used in the previous experiments plus 9 transforms created from them (in DFT increments of 20%). The faces were transformed using the same process as in Experiment 2, but using the difference between the unattractive composite and the typical face (Fig. 5). The unattractive composite face was created by averaging the 5 least attractive of the 92 faces that formed the typical face. In order to choose the least attractive faces, we measured the attractiveness of the 92 faces in a preliminary study. Eighteen female participants from Tel Aviv University rated the attractiveness of the faces, using a 9-point scale ranging from 1 (*definitely unattractive*) to 9 (*definitely attractive*). The mean attractiveness judgment for the entire set was 3.62 (*SD* = 1.13), whereas the mean attractiveness judgment for the 5 least attractive faces was 1.93 (*SD* = 1.15).

Procedure. Experiment 3 repeated the procedure and analytical approach of Experiment 2. Faces were judged on either trustworthiness (*n* = 33) or attractiveness (*n* = 34).

Results

We averaged the three judgments of each face for each participant, except for 3% of the cases, in which only two judgments were averaged because some observations of 8 participants were unrecorded. Cronbach's alpha was .95 for both trustworthiness and attractiveness judgments. Figure 6 shows the average trustworthiness and attractiveness judgments as a function of DFT. As expected, trustworthiness judgments peaked close to the typical face, whereas attractiveness judgments kept increasing as the faces became closer to the attractive composite.

We performed a regression analysis identical to that in Experiment 2. The variables and their interactions predicted the judgments. That is, the model accounted for a significant proportion of the variance in judgments, $F(5, 16) = 69.95$, $p < .001$, $R^2 = .98$. DFT, $\beta = 1.20$, $p < .001$; DFT-squared, $\beta = −0.25$, $p < .005$; judgment type, $\beta = 0.32$, $p < .001$; and the interaction between DFT and judgment type, $\beta = −0.62$, $p < .001$, were significant predictors. Taken together, these results indicated that trustworthiness and attractiveness judgments followed different trends as a function of DFT.

In order to find the predicted DFT where trustworthiness judgments reached a maximum, we fitted a quadratic model using the Levenberg-Marquardt algorithm for nonlinear curve fitting (Levenberg, 1944) to the mean trustworthiness judgments. The predicted DFT for the peak of trustworthiness judgments was 23%, close to the typical face. Similarly, we fitted a model to the mean attractiveness judgments. The predicted DFT for the attractiveness peak was beyond the range tested in this experiment, which indicated that the attractiveness judgments included a highly linear component.

We complemented our by-face analysis with a by-participant repeated measures ANOVA with DFT as a repeated measure and judgment type (trustworthiness vs.
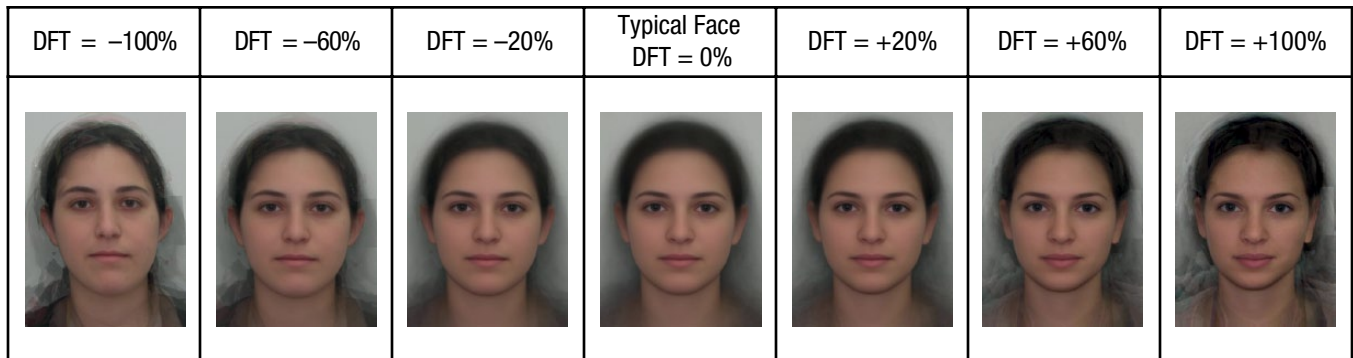
DFT = −100%	DFT = −60%	DFT = −20%	Typical Face DFT = 0%	DFT = +20%	DFT = +60%	DFT = +100%

Fig. 5. Examples of stimuli used in Experiment 3. The face transforms in this experiment were created by adding or subtracting a percentage of the difference in shape and reflectance between a typical face and an unattractive composite face. The unattractive composite face (distance from the typical face, or DFT = −100%) was created by averaging the five least attractive faces in the set from which the typical face (DFT = 0%) was created. At the other end of the continuum (DFT = +100%) was an attractive composite.

attractiveness) as a between-subjects factor. The observed effects supported the same conclusions as the by-face analysis. The main effect of DFT was significant, $F(10, 56) = 18.59$, $p < .001$, $\eta_p^2 = .77$, as was the main effect of judgment type, $F(1, 65) = 6.69$, $p < .012$, $\eta_p^2 = .09$ (see note 2). These main effects were qualified by a significant interaction, $F(10, 56) = 6.47$, $p < .001$, $\eta_p^2 = .54$. Separate

follow-up analyses for trustworthiness and attractiveness judgments showed that DFT had a strong quadratic effect, $F(1, 32) = 32.05$, $p < .001$, $\eta_p^2 = .50$, and a smaller linear effect, $F(1, 32) = 13.65$, $p < .002$, $\eta_p^2 = .30$, on perceived trustworthiness (Fig. 6). For attractiveness, DFT had a strong linear effect, $F(1, 33) = 232.65$, $p < .001$, $\eta_p^2 = .88$, and a much smaller quadratic effect, $F(1, 33) = 13.42$, $p < .002$, $\eta_p^2 = .29$. These findings are similar to the results of Experiments 1 and 2 and suggest that the findings of those experiments are neither an artifact of the specific attractive composite face used nor a result of the transformation process.
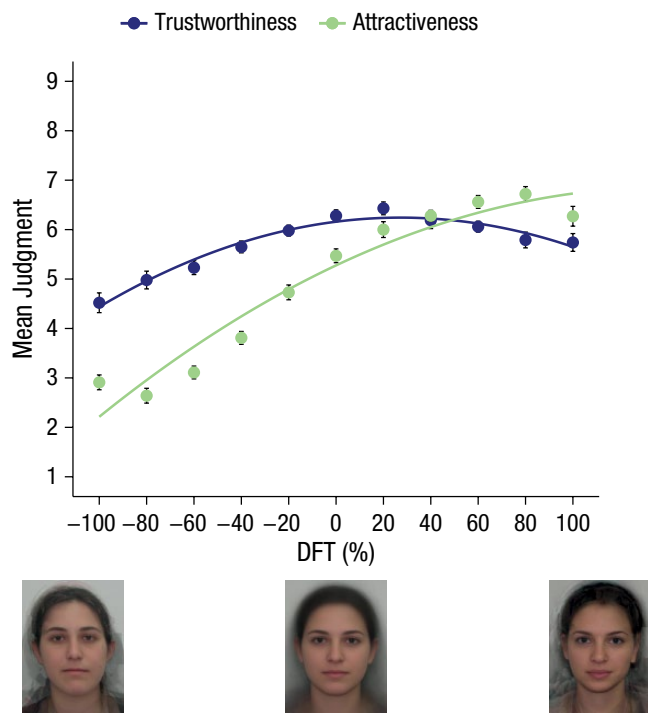
General Discussion

In three experiments, we found consistent evidence for the notion that face typicality is an important determinant of perceived trustworthiness but not of attractiveness. Whereas perceived trustworthiness depends only on the face's distance from the typical face, regardless of direction, perceived attractiveness depends on both distance and direction. Moving away from the typical face in either direction along the typicality-attractiveness dimension decreases the perceived trustworthiness of the face. In contrast, attractiveness increases as the face becomes more like the attractive composite.

By showing the influence of face typicality on perceived trustworthiness, our findings cast a new light on how face typicality influences social perception. They highlight the social meaning of the typical face because trustworthiness judgments approximate the general evaluation of faces. Our findings suggest that the prior evidence for the effect of face typicality on perceived attractiveness (e.g., Langlois & Roggman, 1990; Rhodes, 2006; Rhodes & Tremewan, 1996) was probably due to the fact that attractiveness and trustworthiness judgments have a high level of shared variance for most face samples.

Fig. 6. Results from Experiment 3: mean trustworthiness and attractiveness judgments as a function of distance of the face from the typical face (DFT). In this experiment, the face transforms were created from the typical face and an unattractive composite face. Error bars represent within-subjects standard errors calculated in accordance with Cousineau (2005).

Our findings on the importance of typicality in face evaluation add to the well-established body of knowledge about the importance of typicality for perception and cognition. People's preference for typical configurations has been demonstrated for music (Repp, 1997), colors (Martindale & Moore, 1988), and nonface objects (Halberstadt & Rhodes, 2003). The perceptual organization of nonface objects and faces is similar (Tanaka, Kantner, & Bartlett, 2012) and can be described by the norm-based model (Valentine, 1991), which posits that the typical configuration is located at the space origin. The ability to extract typicality, in general, is already well developed by the age of 3 (Tanaka, Meixner, & Kantner, 2011). It is computationally efficient for such a general information processing mechanism (Halberstadt & Rhodes, 2003) to underlie evaluation of objects, as the brain needs only to learn the statistical distribution of configurations in order to extract typicality (Said, Dotsch, & Todorov, 2010). Typicality and perceived familiarity are highly correlated (Bartlett et al., 1984; Halberstadt & Rhodes, 2003). Familiarity enhances positive affect toward objects (Lee, 2001), and familiar faces are liked more and judged to be safer than unfamiliar faces (Zebrowitz et al., 2007). Taken together, these findings suggest that the high level of perceived trustworthiness of the typical face likely arises from the inherent preference for typicality, mediated by familiarity.

Implications for measuring perceptions of trustworthiness and attractiveness

Earlier work has found a relatively high correlation between the perceived trustworthiness and attractiveness of faces ($r = .6$–$.8$; Oosterhof & Todorov, 2008). It is, therefore, difficult to find a range of faces that follow different trends on these two dimensions. Several methods have been suggested for empirically dissociating these perceptions (e.g., Oosterhof & Todorov, 2008; Todorov, Dotsch, Porter, Oosterhof, & Falvello, 2013), but some of these methods are stringent and not easily implemented. The present study offers a relatively simple method to dissociate perceptions of trustworthiness from perceptions of attractiveness. In this method, an attractive (or unattractive) face and a typical face are transformed to create a range of faces, which are dissociated on the trustworthiness and attractiveness dimensions.

Implications for models of perceived trustworthiness

We have reported a decrease in perceived trustworthiness with increasing DFT. There are other factors that influence perceived trustworthiness, however. For example, Oosterhof and Todorov (2008) found that trustworthiness judgments are influenced by emotional expressions and by feminine and masculine facial cues. Emotionally neutral faces were judged as untrustworthy if they showed subtle cues of anger but as trustworthy if they showed subtle cues of happiness. The authors suggested that these findings reflect a misattribution of emotional expressions signaling approach and avoidance behaviors to stable personality dispositions. It is important to note that Oosterhof and Todorov found that their average face was at the midpoint (not the maximum) of the trustworthiness dimension. Emotional expression and face typicality are different determinants of perceived trustworthiness. Subtle emotional expressions broadcast behavioral intentions (Todorov, 2008), whereas face typicality may signal group or cultural affiliation (Zebrowitz & Montepare, 2008). Given our results, we envision a model of perceived trustworthiness that integrates the typicality-attractiveness dimension discussed here with the emotional-expression dimension identified by Oosterhof and Todorov. Future studies may also incorporate cross-gender designs to overcome the potential limitation of using only female faces and judges, as in the present study. Such designs would make it possible to explore gender differences in reliance on typicality cues for trustworthiness judgments. Thus, a future model could provide a superior description of perceptions of trustworthiness.

Supplemental Material

Additional supporting information can be found at http://pss .sagepub.com/content/by/supplemental-data

Open Practices

All data and materials have been made publicly available via Open Science Framework and can be accessed at https://osf .io/nxrsj/. The complete Open Practices Disclosure for this article can be found at http://pss.sagepub.com/content/by/ supplemental-data. This article has received badges for Open Data and Open Materials. More information about the Open Practices badges can be found at https://osf.io/tvyxz/wiki/ view/ and http://pss.sagepub.com/content/25/1/3.full.

Notes

1. For all three experiments, results for judgments before averaging across blocks are presented in Additional Analyses in the Supplemental Material available online.
2. The sphericity assumption for this analysis and the corresponding analysis in Experiments 2 and 3 was not met. We report multivariate test results, as recommended by Maxwell and Delaney (2004), because these tests are more optimal than correcting for sphericity. The pattern of results did not differ depending on whether we used either a multivariate test or sphericity correction.

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