

Conformity to the Opinions of Other People Lasts for No More Than 3 Days

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Abstract

When people are faced with opinions different from their own, they often revise their own opinions to match those held by other people. This is known as the social-conformity effect. Although the immediate impact of social influence on people's decision making is well established, it is unclear whether this reflects a transient capitulation to public opinion or a more enduring change in privately held views. In an experiment using a facial-attractiveness rating task, we asked participants to rate each face; after providing their rating, they were informed of the rating given by a peer group. They then rerated the same faces after 1, 3, or 7 days or 3 months. Results show that individuals' initial judgments are altered by the differing opinions of other people for no more than 3 days. Our findings suggest that because the social-conformity effect lasts several days, it reflects a short-term change in privately held views rather than a transient public compliance.

Keywords

social conformity, long-term effect, decision making

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Although people like to think of themselves as independent thinkers, there is considerable evidence that personal judgments can be substantially altered in the face of conflicting views expressed by other people; this is known as the social-conformity effect (Asch, 1951; Campbell-Meiklejohn, Bach, Roepstorff, Dolan, & Frith, 2010; Cialdini & Goldstein, 2004; Festinger, 1954). One explanation of conformity phenomena is that people use reward-based reinforcement-learning mechanisms to update their judgments (Cialdini & Goldstein, 2004): If people follow the social norms, they are often rewarded; if they do not, they are often punished. A conflict with social norms can serve as an error signal and guides conforming changes in social judgments (Homans, 1950/1992; Klucharev, Hytonen, Rijpkema, Smidts, & Fernandez, 2009).

Conformity may be present in two forms. In *private acceptance*, people view social norms as an important source of information about the world. Therefore, their opinions or judgments may genuinely be changed by social influence. In this case, behavioral changes are long

lasting and persistent, even when social influence is removed. In *public compliance*, people may change their behavior or reported opinions simply to avoid social rejection while privately continuing to hold their original attitudes. In such circumstances, behavioral changes are transient, and there is no long-lasting alteration in opinion (Cialdini & Goldstein, 2004). Although a number of theories suggest that these two types of conformity are fundamentally distinct (Deutsch & Gerard, 1955; Petty & Cacioppo, 1986), no empirical study has established whether social conformity is a transient form of public compliance to help maintain social cohesion or can result in an enduring change in private personal opinions.

Several functional MRI (fMRI) studies have demonstrated that neural processing in perceptual, emotional,

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and reward circuitry is altered when participants are induced to conform to a group opinion. In one study that used a mental rotation task, researchers demonstrated that conformity was associated with functional change in an occipital-parietal perceptual network, which suggests that the perception of objects is changed during induced conformity (Berns et al., 2005). Another fMRI study showed that social influence regarding the value of an object is associated with the magnitude of ventral striatum response to receiving it, suggesting that the act of conforming to other people has an effect similar to that of rewarding stimuli (Campbell-Meiklejohn et al., 2010). Likewise, another recent study demonstrated that when individuals conform to the majority opinion, the social influence is accompanied by modulated engagement of two brain regions associated with coding subjective value: the nucleus accumbens and orbitofrontal cortex (Zaki, Schirmer, & Mitchell, 2011). The finding that participants' neural representations of the value assigned to stimuli were affected suggests a private acceptance of social norms. Overall, however, these studies do not permit a definitive conclusion about whether the conformity effect reflects a transient compliance with public opinion or a prolonged alteration in private personal values.

In the present study, we considered a simpler way to distinguish whether social conformity reflects private acceptance or public compliance by examining the stability of behavioral changes in judgments. In other words, we reasoned that long-lasting judgment changes are likely to reflect a change in private opinion, whereas transient judgment changes suggest that public compliance is involved. Although many previous studies have demonstrated the conformity effect, the overwhelming majority of them have demonstrated it only shortly (usually around 30 min) after subjects are informed about group opinions. The duration of the effect has therefore not been clearly established. In the present study, we used a face-attractiveness rating task to examine whether social and nonsocial information can influence subsequent judgments over periods of 3 months (Study 1) and 1, 3, or 7 days (Study 2).

Study 1

Participants

Seventeen Chinese students were recruited from South China Normal University ($n = 17$; 5 men, 12 women). Their mean age was 22 years ($SE = 0.53$). All participants were right-handed, had normal or corrected-to-normal vision, and reported no neurological or psychiatric disorders. The study was approved by the Ethics Committee of the School of Psychology at South China Normal University. All participants gave written informed consent and were informed of their right to discontinue

participation at any time. Participants received a payment of 30 yuan (about \$5 U.S.)

Experimental paradigm

The stimuli were 280 digital photographs of the faces of young adult Chinese women posing neutral expressions. These photographs either were downloaded from free Internet sources or were pictures taken of university students (with consent). All photos were in color and of similar quality and general appearance. Participants were informed that they were taking part in a research project on human perception of facial attractiveness. At the beginning of each trial, we presented a photograph of a female face on a computer monitor for 2 s. An 8-point Likert scale (1 = *very unattractive*, 8 = *very attractive*) was then added to the display, and the participants were asked to rate the face by moving an arrow with a computer mouse and clicking when the pointer reached the chosen number (within 4 s). A blue box confirmed the initial rating for 0.5 s. Finally, for 2 s, a green box indicated what was purported to be the average rating of the same face given by 200 other students of the same gender as the participant (peer-group rating; Fig. 1).

The ratings given by the alleged peer group were assigned using the following criteria: In 25% of trials, the group rating agreed with the participant's rating (peers-agree condition); in the remaining 75% of trials, the group rating was equally likely to be 1, 2, or 3 points above or below the participant's rating (peers-higher and peers-lower conditions, respectively). An adaptive algorithm kept the overall proportions of more negative and more positive peer ratings (relative to the participant's rating) approximately equal during the experiment. The assignment of faces to conditions was determined randomly for each participant. After 3 months, participants were called back and asked to complete a second testing session, which they had not been told about previously. In this rerating session, they rated the same faces again. Faces were presented in randomized order, and participants were not reminded of the original peer-group ratings.

Data analysis and results

We first analyzed the behavioral data using the methods described by Klucharev et al. (2009). To control for the overall changes in ratings across sessions, we computed mean-corrected ratings of attractiveness for each session (Sharot, Fleming, Yu, Koster, & Dolan, 2012). The mean-corrected rating was the distance between a subject's rating of a particular face and the average rating for that participant and rating session. We created a rating change score per face (i.e., mean-corrected 3-month rerating minus the mean-corrected initial rating).

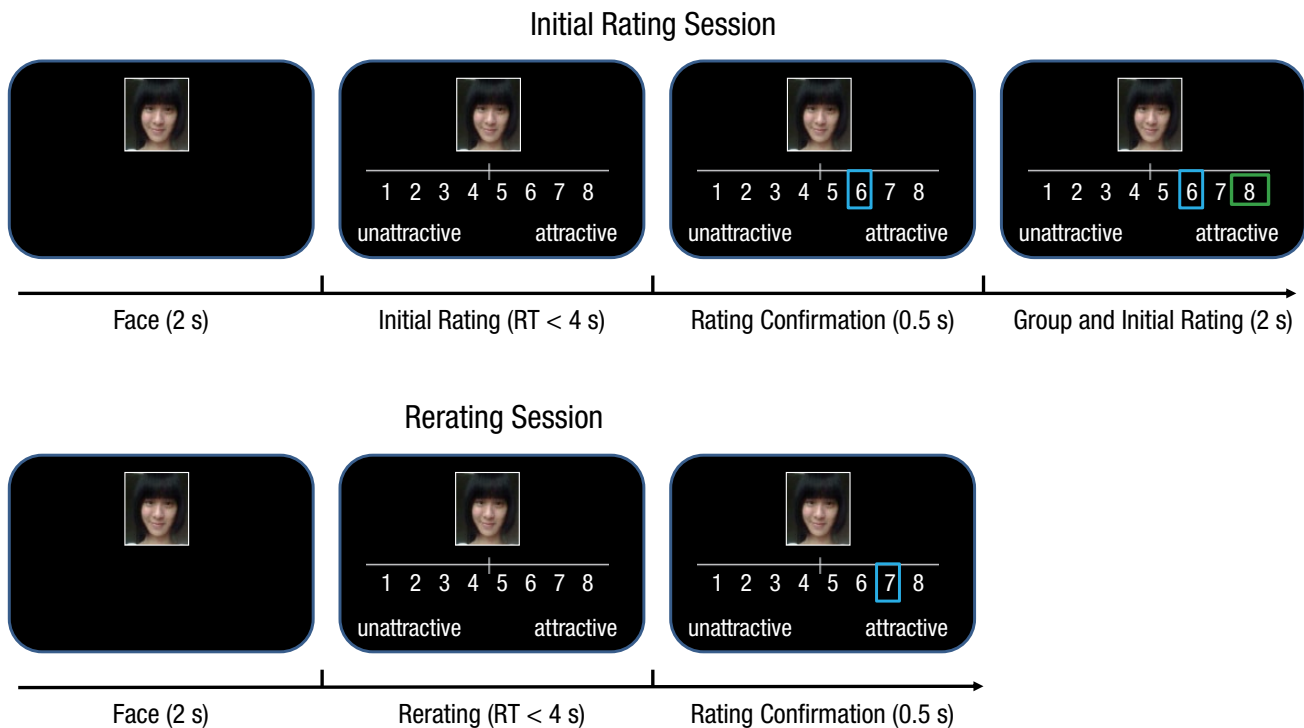


Fig. 1. Illustration of the experimental task. During each trial of the initial rating session, participants viewed a photograph of a female face and used an 8-point Likert scale to rate the face. A blue box appeared to confirm the initial rating. Finally, a green box indicated the average rating of the same face purportedly given by 200 other students of the same gender as the participant (i.e., the peer-group rating). In the rerating session, participants rated the same faces a second time.

A one-way analysis of variance (ANOVA) using conflict with the norm (group rating – initial rating: –3, –2, –1, 0, +1, +2, +3) as a within-subjects factor revealed a significant effect of conflict with the norm on rating change scores, $F(6, 16) = 31.68$, $p < .001$, showing that participants changed their ratings of attractiveness, aligning themselves with the peer-group ratings given 3 months before (Fig. 2a).

The feedback algorithm we used was constrained such that a trial could be assigned to the peers-lower condition only when the participant's initial rating was 4 or higher (which allowed the supposed group rating to be at least 3 points lower); likewise, a trial could be assigned to the peers-higher condition only when the initial rating was 5 or lower (which allowed the supposed group rating to be at least 3 points higher). As a consequence, faces initially given a high rating by participants were assigned to the peers-lower condition disproportionately often, whereas those initially given a low rating by participants were assigned to the peers-higher condition disproportionately often. Thus, the conformity effect shown in our analysis might be explained in part by regression to the mean (i.e., if a variable is extreme at first measurement, it will tend to be closer to the average at second measurement). Paradoxically, if a variable is

extreme at second measurement, it will tend to have been closer to the average at first measurement (Chernick & Friis, 2003; Fleminger, 1994). To solve this problem, we followed the procedure of Zaki et al. (2011) and, for each participant, selected a subset of faces for which the participant's initial ratings were matched across the peers-lower and peers-higher conditions ($p > .20$).

The average numbers of trials for the peers-lower and peers-higher conditions were 66.41 ($SD = 17.74$) and 78.0 ($SD = 14.5$), respectively. In these subsets, which controlled for regression to the mean, the rating change scores (rerating – initial rating) did not differ significantly between the peers-lower condition and the peers-higher condition, $t(16) = -0.062$, $p > .1$ (Fig. 2b).

We also conducted a regression analysis with the rating change between the two sessions as the dependent variable and the magnitude of conflict with the norm as the independent variable. Results showed that conflict with the norm significantly predicted rating change after 3 months, $p < .001$. To control for the effect of regression to the mean, we added the initial rating as another independent variable in a new regression model. In this new model, the coefficient for conflict with the norm was not significant ($p = .96$). Thus, after controlling for the regression to the mean, there is no evidence for a very

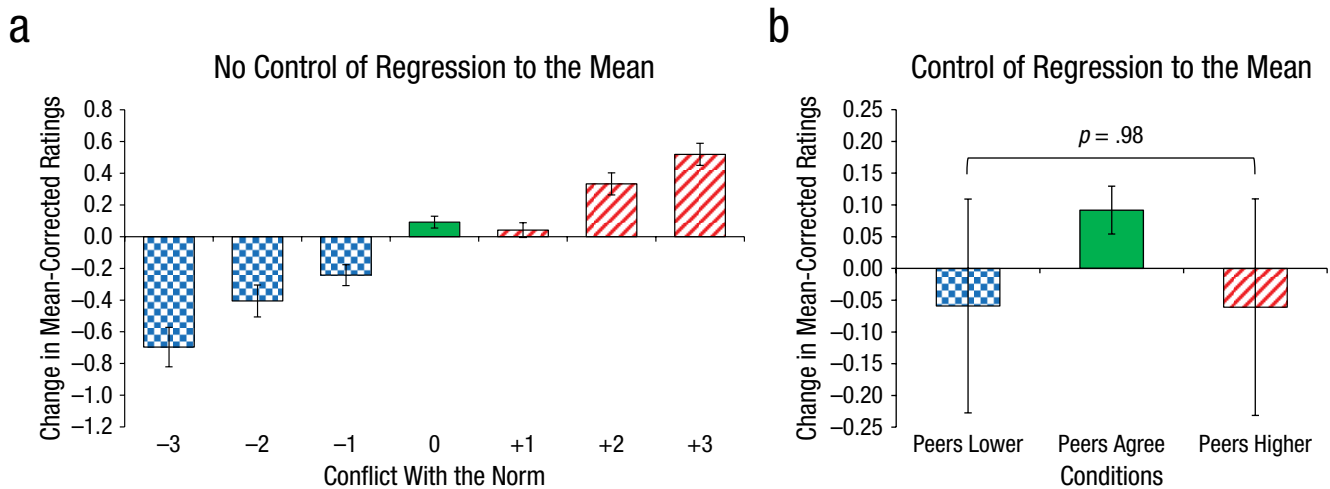


Fig. 2. Conformity effect in Study 1. The graph in (a) shows change in mean-corrected ratings after 3 months as a function of difference from the original ratings (conflict with the norm: 0 = no conflict; +1, +2, +3 = group ratings were 1, 2, or 3 points more positive than initial ratings, respectively; -1, -2, -3 = group ratings were 1, 2, or 3 points more negative than initial ratings, respectively). The graph in (b) shows change in mean-corrected ratings after 3 months as a function of condition. Results in (b) were from subsets of faces for which initial ratings were matched between the peers-higher and peers-lower conditions, to control for regression to the mean. Error bars indicate ± 1 SE.

long-term influence of social conformity on participants' attractiveness ratings.

Study 2

Participants and experimental paradigm

To better ascertain whether social conformity could nevertheless persist beyond an initial transient period, we next decreased the interval between the initial and the rerating sessions to periods of no more than 1 week. Three different groups of student participants were recruited from South China Normal University. The 1-day group ($n = 18$; 7 men, 11 women; mean age = 20.72 years, $SE = 0.36$) rerated the faces 1 day after the initial rating session. The 3-day group ($n = 16$; 6 men, 10 women; mean age = 20.81 years, $SE = 0.42$) rerated the faces 3 days after the initial rating session. The 7-day group ($n = 17$; 8 men, 9 women; mean age = 21.53 years, $SE = 0.37$) rerated the faces 7 days after the initial rating session. Participants performed the same initial rating task as that in Study 1 and they did not rerate the faces until 1, 3, or 7 days later. We created a rating change score per face (i.e., mean-corrected 1-, 3-, or 7-day rerating minus the mean-corrected initial rating). Participants received a payment of 25 yuan (about \$4 U.S.)

Results

In this study, we controlled for regression to the mean by examining ratings of a subset of faces for which the participants' initial ratings were matched in the peers-lower

and peers-higher conditions ($ps > .20$). The average numbers of trials for the peers-lower and peers-higher conditions were 74.83 ($SD = 18.88$) and 80.39 ($SD = 14.98$) for the 1-day group, 65.5 ($SD = 15.33$) and 85.5 ($SD = 13.44$) for the 3-day group, and 67.82 ($SD = 14.09$) and 89.3 ($SD = 13.95$) for the 7-day group. For the 1-day group, the rating change between the peers-lower and peers-higher conditions was significant, $t(17) = -2.56$, $p = .021$; participants rated faces in the peers-higher condition as more attractive than faces in the peers-lower condition (Fig. 3a). The rating change was also significant for the 3-day group, $t(15) = -2.35$, $p = .033$ (Fig. 3b), but not for the 7-day group, $t(16) = -1.22$, $p = .238$ (Fig. 3c)

Regression analyses showed that when conflict with the norm was the only independent variable, it significantly predicted rating change after 1, 3, and 7 days ($ps < .001$). When initial rating was included as another independent factor, the effect of conflict with the norm remained significant for the 1-day group ($p < .001$) and the 3-day group ($p = .05$), but not for the 7-day group, $p = .20$. Thus, the social conformity change was maintained for up to 3 days, but not for 7 days.

Discussion

Overall, our study shows that social conformity in facial attractiveness judgments persists for up to 3 days, but not for longer than 7 days. The effect remained when we controlled for regression to the mean. Our results suggest that it was not due simply to public compliance, which would be expected to result only in highly transient opinion change. Our findings instead support the

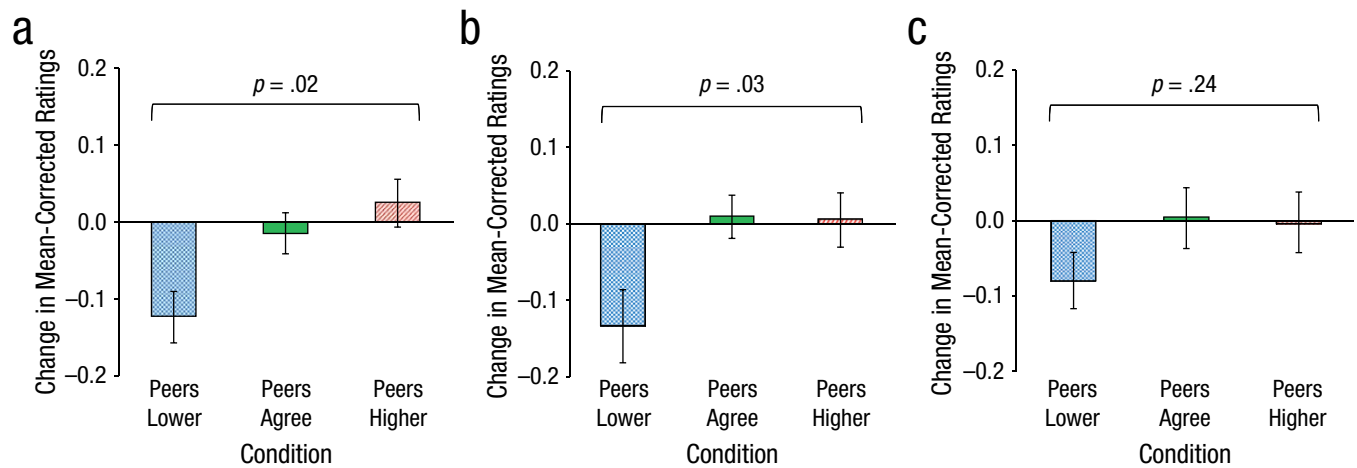


Fig. 3. Conformity effect in Study 2. Change in mean-corrected ratings is shown as a function of condition for the three groups of participants: (a) those who rerated the faces after 1 day, (b) those who rerated the faces after 3 days, and (c) those who rerated the faces after 7 days. Error bars indicate $\pm 1 SE$.

conclusion that the social-conformity effect observed probably reflected a change in privately held views. However, because the alteration in opinions lasted for only a few days, it is probable that opinions were quickly revised as a result of subsequent experience, so that judgments of facial attractiveness were reset back to the original norm.

A recent study showed that participants' preferences remained socially influenced even after 4 months (Izuma & Adolphs, 2013). However, that effect may be explained simply by the tendency for people to make consistent decisions when asked to rate their preferences three times. Participants rated their preferences for T-shirts, saw other people's preferences for the same T-shirts, reevaluated the T-shirts on the same day, and finally rerated the T-shirts after 4 months. Participants had already changed their attitudes and explicitly expressed their preference at the second rating, and therefore maintenance of similar ratings on the third occasion might have been influenced by the tendency to maintain consistent decisions. Such an effect would resemble the classic choice-induced preference effect: After people make a choice, they tend to value the chosen alternative more and the rejected alternative less (Festinger & Carlsmith, 1959; Izuma et al., 2010; Sharot et al., 2012). Although participants did not make any choices per se in Izuma and Adolphs's study, their explicit act of rating the shirts a second time may still have influenced their preference at the third rating. It has been demonstrated that choice-induced preference can last about 2 years, despite the fact that participants no longer remember their previous choices (Sharot et al., 2012). Thus, it is probable that the long-lasting effect of social influence reported by Izuma and

Adolphs was at least partially driven by choice-induced preference change.

Our results also demonstrate the importance of controlling for regression to the mean in this type of social-conformity paradigm. When we followed the analysis method used by Klucharev et al. (2009), we found support for a conclusion that social-conformity effects can persist for up to 3 months. However when we controlled for regression to the mean, evidence for a long-term effect disappeared. This finding has important potential implications for the design and analysis of future experiments in this field, and it raises concerns that results from previous studies might also be confounded by regression to the mean.

It is possible that the relatively short duration of the social-conformity effect on facial-attractiveness judgments was the result of participants' daily exposure to large numbers of faces. A resetting of individual judgment norms could have occurred more quickly than it would for classes of objects viewed infrequently. Future experiments using a range of different stimuli are needed to address the question of whether the social-conformity effect has a relatively constant duration or is modulated by factors such as the frequency with which people encounter particular classes of objects and also the familiarity and valence of these objects.

In conclusion, the present study has provided the first evidence that social-conformity effects are enduring, at least over a matter of several days. This suggests that social conformity in the context of aesthetic judgments is not simply a result of temporary compliance with public views; rather, it seems to be a genuine change in privately held views, although opinions may quickly be revised in light of subsequent experience.

Author Contributions

Y. Huang and K. M. Kendrick contributed equally to this work. R. Yu developed the study concept. Y. Huang performed the testing and collected the data. Y. Huang analyzed and interpreted the data under the supervision of R. Yu and K. M. Kendrick. Y. Huang drafted the manuscript, and R. Yu and K. M. Kendrick provided critical revisions. All authors approved the final version of the manuscript for submission.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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