SOCIAL INFLUENCE, EVOLUTIONARY THEORY, AND SYMMETRY

A Senior Honors Thesis

By

AMY ELIZABETH PINKHAM

Submitted to the Office of Honors Programs
& Academic Scholarships
Texas A&M University
In partial fulfillment of the requirements of the

UNIVERSITY UNDERGRADUATE
RESEARCH FELLOWS

April 2000

Group: Psychology 2

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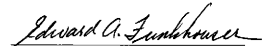
Approved as to style and content by:

William G. Graziano
(Fellows Advisor)



Edward A. Funkhouser
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April 2000

Group: Psychology 2

ABSTRACT

Social Influence, Evolutionary

Theory, and Symmetry. (April 2000)

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Perceptions of attractiveness for symmetrical and asymmetrical stimuli were investigated. Participants were randomly assigned to one of two conditions in which they either discussed the stimuli or engaged in a distraction task. In both conditions, individuals in same-sex groups of 4 - 12 were asked to independently rate both symmetrical and asymmetrical people and symmetrical and asymmetrical fashions for attractiveness and then, depending on the condition to which they were assigned, to either discuss and formulate a group rating for each stimulus or to participate in the distraction task. Participants were then asked to independently re-rate the stimuli. Differences between time one and time two ratings were analyzed. Results indicate mixed support for an evolutionary hypothesis that predicts *no* change over time in the non-discussion condition and a change only in the ratings for asymmetrical stimuli after discussion. The evolutionary hypothesis also suggests that symmetrical stimuli may be moderately resistant to social influence.

ACKNOWLEDGMENTS

I would like to thank Brad E. Sheese for his endless encouragement and assistance with this project as well as his enthusiasm and willingness to guide a clueless undergraduate. I would also like to thank William G. Graziano, PhD for his guidance, patience, and assistance that went well above and beyond the call of duty. In addition, I would like to thank Nancy D. Rhodes, PhD for her support and countless contributions to my intellectual growth. And finally, Jeff Simpson, PhD for his stimulus materials, Ludy T. Benjamin, Jr., PhD for his contribution to the introduction, and the numerous members of Dr. Graziano's research team who assisted with data collection and data entry, specifically, Ben Baron, Kyle Doherty, Tracy Ehrlich, Stephanie Knight, Kim Loftus, Meghan McGlohen, Gina Pierce, and Megan Surley.

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INTRODUCTION

As early as 1931, scientific research was being conducted on facial symmetry although it was not recognized as such at the time. A startling study published by William Edward Benton entitled "How to Pick Your Future Mate" stated that the left side of the face represented the subconscious self while the right side represented the conscious self. Benton never actually referred to these differences in the right and left sides of the face as asymmetry, but the parallel to recent research is strikingly clear.

Proponents of evolutionary theory have published numerous studies focusing on human and animal fluctuating asymmetry (FA) that link it to sexual selection and attractiveness. FA refers to the amount of deviation between features of the right and left sides of the body from perfect bilateral symmetry (Simpson, Gangestad, Christensen, & Leck, 1999; Van Valen, 1962). Although the exact causes are unknown, evidence suggests that environmental pollutants, contact with parasites during development, or genetic factors may play a vital role in the origin of FA (Livshits & Kobyliansky, 1989; Simpson et al., 1999).

Studies of body FA have yielded interesting results. Concerning sexual selection, Thornhill and Gangestad (1994) report that more asymmetrical individuals have fewer lifetime sex partners and a later age of first copulation compared to their more symmetrical counterparts, and FA has also been negatively correlated with total number of extrapair copulations (Gangestad & Thornhill, 1997). In terms of attraction, numerous studies have demonstrated the importance of physical attractiveness in mate selection (Buss, 1989; Buss & Angleitner, 1989; Walster, Aronson, Abrahams, &

This thesis follows the style and format of *Personality and Social Psychology Bulletin*.

Rottmann, 1966), and of course, physical attractiveness is highly related to FA (Gangestad, Thornhill, & Yeo, 1994; Thornhill & Gangestad, 1994). Strengthening this claim are studies showing that facial attractiveness negatively correlates with FA (Gangestad, et al., 1994), even among *monozygotic twins* (Mealey, Bridgstock, & Townsend, 1999).

It is implausible that symmetry is the only determinant of judgments of physical attractiveness. Recent research indicates that social influence is another contributor. A brief review of the social influence data reveals that group discussions to consensus alter the perceptions of the individuals in the group (Moscovici & Zavalloni, 1969) and that when exposed to decisions produced by consensus, subjects shift their own opinions toward those held the group (Allen & Wilder, 1980). Specifically, in terms of rating attractiveness, females are more influenced by peers and especially by peer's negative ratings when rating both males and females (Graziano, Jensen-Campbell, Shebilske, & Lundgren, 1993). A follow up study by Graziano, Jensen-Campbell, and Schreindorfer (1998) demonstrated that overall, individuals are more likely to conform to peer judgments of physical attractiveness when in public rather than private conditions.

In light of these findings, and intriguing question can be posed. What would happen if stimuli varying in FA were rated and subjected to systematic social influence? Would the symmetrical stimuli consistently receive the highest ratings, or would social influence alter the ratings? Another question introduced from the previous research includes the range of the human preference for symmetry. The evolution-based arguments seem to imply that symmetry preferences should be restricted to persons of

the other sex, or perhaps to persons in general. If persons prefer symmetry in all objects they judge, then it is possible that mechanisms other than evolutionary ones may be operating as well. Of course, such an outcome would not rule out evolutionary mechanisms, because a mechanism originally framed for dealing with mates may generalize. Nevertheless, general preferences for symmetry would suggest the need for qualifications of a narrow evolutionary mechanism in judging physical attractiveness.

In response to these issues, and based on previous studies, we hypothesized that in a situation where social influence is applicable, one of two outcomes is possible. First, keeping in tradition with the literature, we would expect to see a uniform shift toward more negative ratings after the introduction of social influence for both low FA and high FA stimuli thus demonstrating that social influence does in fact have an impact on perceptions of attractiveness (see Figure 1). The second possibility is that there would be no difference between pre-social influence ratings and post-social influence ratings for symmetrical (low FA) stimuli and a decrease in the attractiveness ratings for the asymmetrical (high FA) stimuli. This outcome would provide support for evolutionary theory (see Figure 2). In a condition where social influence is not introduced, we expect no difference in the ratings over time. Finally, we hypothesize that the preference for symmetrical items will occur in domains other than human attractiveness.

Figure 1. Evidence in Support of Social Influence Theory

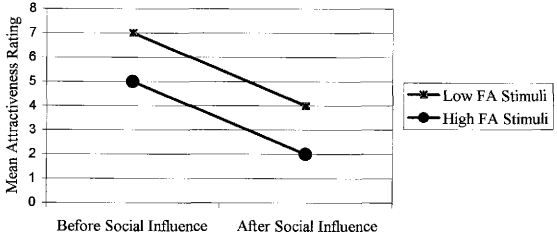

Figure 1 The decline in the ratings for both high FA and low FA stimuli after the introduction of social influence demonstrates that peer judgments can alter perceptions of attractiveness.

Figure 2. Evidence in Support of Evolutionary Theory

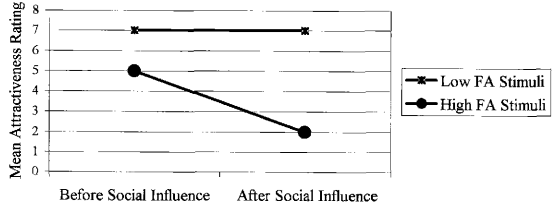

Figure 2 The decline only in ratings for high FA stimuli indicates that low FA stimuli may be resistant to the effects of social influence on perceptions of attractiveness.

METHODS

Participants. Research participants were male and female undergraduate Texas A&M students (N=295, 161 females and 134 males) between the ages of 18 and 22.

Stimulus materials. The first stimulus set contained twelve photographs of individuals that were selected from a larger set of video clips used in previous research (i.e., Simpson et al., 1999). Each individual in the clips was measured for body symmetry, and a fluctuating asymmetry score was calculated for each. The set included three females with low FA scores (symmetrical females), three females with high FA scores (asymmetrical females), three males with low FA scores (symmetrical males), and three males with high FA scores (asymmetrical males). Each photo in the set was sharpened using Adobe Photoshop but was not altered in anyway that would distort body symmetry.

The second stimulus set included symmetrical and asymmetrical fashions in the same ratio as the photographs of the individuals. The fashions were selected through pilot testing from a larger set of 50, which was compiled of runway fashions taken from the web site firstview.com. The fashions were chosen at random but with consideration for a contemporary, conservative look. All of the fashion photos were altered to eliminate the model's head and feet to prevent the attractiveness of the model or the shoes from influencing the attractiveness of the actual clothing (See APPENDIX for examples).

During the pilot testing, sixty participants viewed each photograph twice and rated it for attractiveness on the second presentation. The three fashions of each category (female asymmetrical, female symmetrical, male asymmetrical, and male

symmetrical) with the highest average ratings were selected for use in the second stimulus set.

Three separate presentations were created for each stimulus set. Two of the presentations in each set were designed so that each photo would be displayed for five seconds during a preview section, ten seconds during the first rating section, and ten seconds during the second rating section. In each section, the photographs were randomly ordered and were in a different random order than the other sections and the other presentation for that set. The third presentation for each stimulus set included only one section during which participants could view the photos for as long as needed and was used for the discussion portion of the study.

Procedure. Procedures were adapted from the Graziano et al. (1993) social influence studies. Participants were randomly assigned to one of two conditions in which they either engaged in a discussion of the stimulus materials or engaged in a distraction task. In both conditions, participants reported in same sex groups of four to twelve and were asked to rate the stimuli in each set for attractiveness on a scale from 1 (extremely unattractive) to 9 (extremely attractive). The first stimulus set was presented, and participants assigned a rating to each stimulus. Following the first rating, subjects in the discussion condition discussed each individual/fashion and decided on a group rating for each, and subjects in the distraction condition worked together on a group embedded figures task. A second independent (private) rating followed the group interaction in both conditions, and then the same procedure occurred for the second stimulus set. The stimuli were presented in a randomized order (the tasks and items), and all subjects saw both stimulus sets.

RESULTS

Recall our hypotheses. We hypothesised that in a situation where social influence is applicable, one of two outcomes is possible. First, it is possible that social influence is a powerful force that affects social judgments of attractiveness regardless of their symmetry of the object being evaluated. If this were true, then we would expect to see a uniform shift toward more negative ratings after the introduction of social influence for both low FA and high FA stimuli. A second possibility was that there would be no difference between pre-social influence ratings and post-social influence ratings for symmetrical (low FA) stimuli and a decrease in the attractiveness ratings for the asymmetrical (high FA) stimuli. Finally, we hypothesized that the preference for symmetrical items would occur in domains other than human attractiveness. These hypotheses were evaluated using a four factor mixed-model ANOVA. We treated Discussion as a between-subjects factor and Content (people vs. fashion), Time, and Symmetry as with-subjects factors.

Outcomes of the ANOVA revealed significant main effects for Time [$\underline{F}(2,291) = 37.00$, MSE = 0.13, $\underline{p} < .001$], Symmetry [$F(2,291) = 182.47$, MSE = 0.71, $\underline{p} < .001$], and Content [$\underline{F}(2,291) = 231.64$, MSE = 2.24, $\underline{p} < .001$]. The main effect for discussion was not significant [$F(1,291) = 0.79$, MSE = 3.206, $\underline{ns}$.]. The significant main effects were qualified by higher-order interactions, most notably a four-way interaction [$\underline{F}(2,291) = 64.30$, MSE = .111, $\underline{p} < .001$]. This interaction was decomposed using independent-sample and paired-sample t-tests, conducted with a Bonferroni correction. To assist in explaining this four-way interaction the analyses are presented separately for

people and fashion. Table 1 presents the means and the standard deviations for people content. Table 2 presents the means and standard deviations for fashion content. Figure 3 presents the interaction for people content. Figure 4 presents the interaction for fashion content.

Overall, fashions received higher ratings than people, and ratings at the second assessment were lower than ratings at the first assessment. Within these patterns, however, other patterns emerged. For fashions, symmetrical clothing was generally rated as more attractive than asymmetrical clothing, and there was no evidence that discussion altered that pattern. For asymmetrical fashions, however, discussion did influence the pattern of evaluation. Ratings of discussed asymmetrical fashions at time 2 were significantly lower ($\underline{M}$ = 5.19) than nondiscussed asymmetrical fashion ($\underline{M}$ = 5.54; $\underline{p}$ < .01).

For the evaluation of people, a somewhat different pattern appeared. As with fashions, symmetrical persons received higher initial ratings than did asymmetrical persons. For people, however, ratings declined with discussion, but were larger for the asymmetrical persons than for the symmetrical persons (p-values of .18 and .001 for symmetrical and asymmetrical persons respectively). This pattern of outcomes suggests that discussion, per se, was not the critical element in the declining ratings of symmetrical persons.

TABLE 1: Means and Standard Deviations for People

	Time 1 Mean (Standard Deviation)	Time 2 Mean (Standard Deviation)
Non-discussion		
Symmetrical People	5.08a (.950)	4.99b (.975)
Asymmetrical People	4.77c (.914)	4.72c (.993)
Discussion		
Symmetrical People	5.14a (.766)	4.84b (.714)
Asymmetrical People	4.74c (.923)	4.36d (.682)

Note. Means that share subscripts are not significantly different.

TABLE 2: Means and Standard Deviations for Fashion

	Time 1 Mean (Standard Deviation)	Time 2 Mean (Standard Deviation)
Non-discussion		
Symmetrical Fashion	6.17a (.874)	6.08a (.952)
Asymmetrical Fashion	5.58b (1.084)	5.54b (1.159)
Discussion		
Symmetrical Fashion	6.29a (.869)	6.09c (.706)
Asymmetrical Fashion	5.73d (1.065)	5.19e (1.030)

Note. Means that share subscripts are not significantly different.

Figure 3. Interaction for People

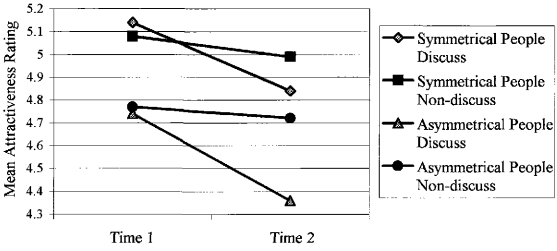

Figure 3 The interaction between time, symmetry and discussion is evident as is the decline in the ratings for asymmetrical people in the discussion condition.

Figure 4. Interaction for Fashion

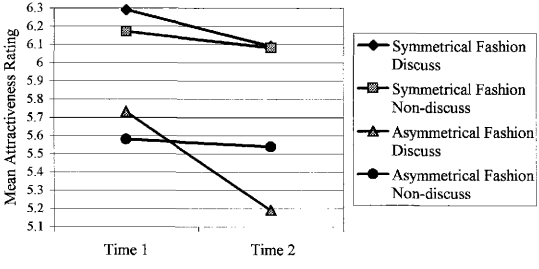

Figure 4 The interaction between time, symmetry, and discussion is evident. Note also the decline in the ratings for asymmetrical fashions in the discussion condition.

SUMMARY AND CONCLUSION

Overall, the social influence hypothesis, which stated that there would be a uniform shift toward more negative ratings for both symmetrical and asymmetrical stimuli after the introduction of social influence, was not supported. Our hypothesis that the preference for symmetry would occur in domains other than human attractiveness was supported, and the evolutionary hypothesis received mixed support. Our evolutionary hypothesis anticipated a decline in the attractiveness ratings for asymmetrical stimuli after the introduction of social influence and no change between the pre- and post-social influence ratings for symmetrical stimuli. Both the social influence hypothesis and the evolutionary hypothesis predicted no change over time in non-social influence conditions.

The evolutionary hypothesis yielded mixed support. On the positive side, the evolutionary hypothesis is supported by the findings for declining negative ratings of asymmetrical people, especially with discussion. In the discuss condition, there is a significant decrease in the ratings for asymmetrical stimuli only. The general finding that the mean ratings for both the discussion and non-discussion conditions at time 2 were only significantly different for the asymmetrical stimuli also supports the evolutionary hypothesis.

On the negative side, there were inconsistencies between the predictions and the actual outcome for symmetrical people as stimuli. In both the discussion and non-discussion conditions, the ratings for symmetrical people showed a significant decline between time one and time two. Because of the decline in both conditions and the absence of a main

effect for discussion, we can infer that the decline in the ratings was not due to discussion, per se. Further, the decline in ratings for symmetrical items is not consistent with the evolutionary hypothesis.

Despite the inconsistencies, the greater degree of change in the ratings for asymmetrical items as opposed to the change in the ratings for symmetrical items after the introduction of social influence favors the evolutionary hypothesis. The fact that the symmetrical items show less of a change after discussion may indicate that symmetrical stimuli are not completely immune, but somewhat resistant to social influence. Therefore, in judgements of physical attractiveness, peer influences do alter individual perceptions, but symmetrical items are less likely to be altered by peer input than are asymmetrical items.

It might be argued that the stimuli confound attractiveness with symmetry, and that outcomes of the present research merely demonstrate that inherently attractive stimuli show less change in rating over time than do less attractive stimuli. If this alternative explanation were correct, then the within-group variability in attractiveness ratings at time 1 would be lower for the symmetrical persons than for the asymmetrical persons. The outcomes, however, showed no evidence that the within-group variability for symmetrical persons (SDs = .95 and .76 for non-discuss and discuss respectively) was systematically different from the asymmetrical persons (SDs = .91 and .92 for non-discuss and discuss respectively). Thus, the evidence does not seem to support the alternative explanation of an attractiveness-symmetry confound.

The present research provides only a preliminary examination of the links among

evolutionary processes and social influence. Future research needs to pursue inconsistencies found here in evolutionary explanations. In particular, it is not clear why symmetrical persons, who should receive invariantly positive evaluations, receive declining ratings over time. Nor is it clear why symmetrical fashions should receive more positive evaluations than asymmetrical ones. It is possible that evolution has shaped preferences for symmetry in persons, which later comes to be generalized to fashions. On the other hand, it is not implausible that cultural socialization also contributes to preferences for symmetry in fashion. Disentangling these explanations is a challenge for future research. Amen.

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APPENDIX

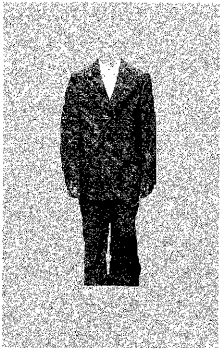

Figure 5. Asymmetrical Male Fashion

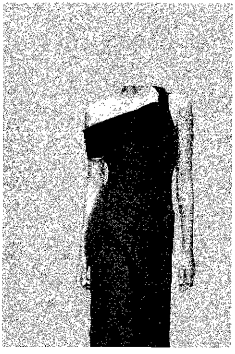

Figure 7. Asymmetrical Female Fashion

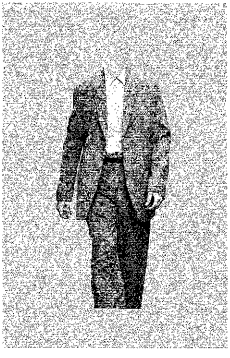

Figure 6. Symmetrical Male Fashion

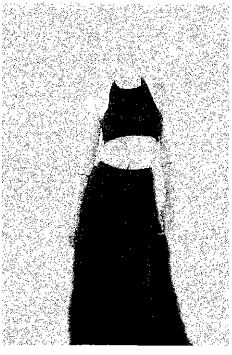

Figure 8. Symmetrical Female Fashion

VITA April 13, 2000

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Special Recognition: University Undergraduate Research Fellow
Summa Cum Laude

Conference Presentations

Pinkham, A. E., Sheese, B. E., Graziano, W. G., & Lawson, K. D. (1999). *Social influence, evolutionary theory and symmetry.* Poster presented at the 2000 American Psychological Association Annual Convention, Washington, D.C.

Rhodes, N., Babcock, D., Pinkham, A. E., & Oates, M. J. (1998). *Processing of threatening information is affected by similarity to source of threat.* Poster presented at 10th Annual American Psychological Society Convention, Washington, D.C.

Honors

Dean's List, Texas A&M University, Fall 1996, Spring 1997, Spring 1998, and Fall 1998
Phi Eta Sigma Honor Society 1997-98
Psi Chi Psychology Honor Society 1998
Phi Kappa Phi Honor Society 1999-2000
Golden Key National Honor Society 1999-2000