

ARTICLE 5

A variety of sources of information may be available for use in forming an impression of a person. However, that does not mean that all of the information will be used or hold equal value. Some sources of information may carry more weight than others. For example, we may notice how the person acts, or we may have heard something about him or her from someone else. How do we use this information to develop an impression of the person?

Building on the classic work of S. E. Asch, Harold H. Kelley examines what can be called a *central impression trait*, one that is important in influencing the impressions that we form. By examining the effect of changing just one adjective in describing a person (i.e., *warm* versus *cold*), the study demonstrates that these initial differences in initial impression carried over into how the subjects interacted with the person. The impression is that perhaps our initial impressions lead us to act in certain ways toward others, perhaps creating a self-fulfilling prophecy by giving us what we expected to see in the first place.

The Warm-Cold Variable in First Impressions of Persons

■ Harold H. Kelley

This experiment is one of several studies of first impressions (3), the purpose of the series being to investigate the stability of early judgments, their determinants, and the relation of such judgments to the behavior of the person making them. In interpreting the data from several nonexperimental studies on the stability of first impressions, it proved to be necessary to postulate inner-observer variables which contribute to the impression and which remain relatively constant through time. Also some evidence was obtained which directly demonstrated the existence of these variables and their nature. The present experiment was designed to determine the effects of one kind of inner-observer variable, specifically, *expectations* about the stimulus person which the observer brings to the exposure situation. That prior information or labels attached to a stimulus person make a difference in observers' first impressions is almost too obvious to require demonstration. The expectations resulting from such preinformation may restrict, modify, or accentuate the impressions he will have. The crucial question is: What changes in perception will accompany a given expectation? Studies of stereotyping, for example, that of Katz and Braly (2), indicate that from an ethnic label such as "German" or "Negro," a number of perceptions follow which are culturally determined. The present study finds its main significance in relation to a study by Asch (1) which demonstrates that certain crucial labels can transform the entire impression of the person, leading to attributions which are related to the label on a broad cultural basis or even, perhaps, on an autochthonous basis.

The present study tested the effects of such central qualities upon the early impressions of *real* persons, the same qualities, "warm" vs. "cold," being used. They were introduced as preinformation about the stimulus person before his actual appearance; so presumably they operated as expectations rather than as part of the stimulus pattern during the exposure period. In addition, information was obtained about the effects of the expectations upon the observers' behavior toward the stimulus person. An earlier study in this series has indicated that the more incompatible the observer initially perceived the stimulus person to be, the less the observer initiated interaction with him thereafter. The second purpose of the present experiment, then, was to provide a better controlled study of this relationship.

No previous studies reported in the literature have dealt with the importance of first impressions for behavior. The most

Let's think about Unattractive
Shows and movies that we have seen where someone tells of their self-esteem issues and now have revenge because they no longer look like they once did when they were a kid

A label can have been known to affect us. Being called unattractive can hurt. This is a label that follows us and negatively affects our self-esteem.

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student initiated verbal interaction with the instructor. After the discussion period, the stimulus person left the room, and the experimenter gave the following instructions:

Now, I'd like to get your impression of Mr. _____. This is not a test of you and can in no way affect your grade in this course. This material will not be identified as belonging to particular persons and will be kept strictly confidential. It will be of most value to us if you are completely honest in your evaluation of Mr. _____. Also, please understand that what you put down will not be used against him or cause him to lose his job or anything like that. This is not a test of him but merely a study of how different classes react to different instructors.

The subjects then wrote free descriptions of the stimulus person and finally rated him on a set of 15 rating scales.

RESULTS AND DISCUSSION

1. Influence of warm-cold variable on first impressions. The

differences in the ratings produced by the warm-cold variable were consistent from one section to another even where different stimulus persons were used. Consequently, the data from the three sections were combined by equating means (the S.D.'s were approximately equal) and the results for the total group are presented in Table 1. Also in this table is presented that part of Asch's data which refers to the qualities included in our rating scales. From this table it is quite clear that those given the "warm" preinformation consistently rated the stimulus person more favorably than those given the "cold" preinformation. Summarizing the statistically significant differences, the "warm" subjects rated the stimulus person as more considerate of others, more informal, more sociable, more popular, better natured, more humorous, and more humane. These findings are very similar to Asch's for the characteristics common to both studies. He found more frequent attribution to his hypothetical "warm" personalities of sociability, popularity, good naturedness, generosity, humorosity, and humaneness. So these data strongly support his finding that such a central quality as "warmth" can greatly influence the total impression of a personality. This effect is found to be operative in the perception of real persons.

This general favorableness in the perceptions of the "warm" observers as compared with the "cold" ones indicates that something like a halo effect may have been operating in these ratings. Although his data are not completely persuasive on this point, Asch was convinced that such a general effect was not operating in his study. Closer inspection of the present data makes it clear that the "warm-cold" effect cannot be explained altogether on the basis of simple halo effect. In Table 1 it is evident that the "warm-cold" variable produced differential effects from one rating scale to another. The size of this effect seems to depend upon the closeness of relation between the

relevant data are found in the sociometric literature, where there are scattered studies of the relation between choices among children having some prior acquaintance and their interaction behavior. For an example, see the study by Newstetter, Feldstein, and Newcomb (8).

PROCEDURE

The experiment was performed in three sections of a psychology course (Economics 70) at the Massachusetts Institute of Technology.² The three sections provided 23, 16, and 16 subjects respectively. All 55 subjects were men, most of them in their third college year. In each class the stimulus person (also a male) was completely unknown to the subjects before the experimental period. One person served as stimulus person in two sections, and a second person took this role in the third section. In each case the stimulus person was introduced by the experimenter, who posed as a representative of the course instructors and who gave the following statement:

Your regular instructor is out of town today, and since we of Economics 70 are interested in the general problem of how various classes react to different instructors, we're going to have an instructor today you've never had before. Mr. _____, at the end of the period, I want you to fill out some forms about him. In order to give you some idea of what he's like, we've had a person who knows him write up a little biographical note about him. I'll pass this out to you now and you can read it before he arrives. Please read these to yourselves and don't talk about this among yourselves until the class is over so that he won't get wind of what's going on.

Two kinds of these notes were distributed, the two being identical except that in one the stimulus person was described among other things as being "rather cold" whereas in the other form the phrase "very warm" was substituted. The content of the "rather cold" version is as follows:

Mr. _____ is a graduate student in the Department of Economics and Social Science here at M.I.T. He has had three semesters of teaching experience in psychology at another college. This is his first semester teaching Ec. 70. He is 26 years old, a veteran, and married. People who know him consider him to be a rather cold person, industrious, critical, practical, and determined.

The two types of preinformation were distributed randomly within each of the three classes and in such a manner that the students were not aware that two kinds of information were being given out. The stimulus person then appeared and led the class in a twenty-minute discussion. During this time the experimenter kept a record of how often each student participated in the discussion. Since the discussion was almost totally leader-centered, this participation record indicates the number of times each

TABLE 1 / Comparison of "Warm" and "Cold" Observers in Terms of Average Ratings Given Stimulus Persons

Item	Low End of Rating Scale		High End of Rating Scale		Level of Significance of Warm-Cold Difference	Percent of Group Assigning Quality at Low End of Our Rating Scale*
	Knows his stuff	Doesn't know his stuff	Warm N = 7	Cold N = 28		
1	3.5	4.6	3.5	4.6		
2	Considerate of others	Self-centered	6.3	9.6	1%	
3†	Informal	Formal	6.3	9.6	1%	
4†	Modest	Proud	9.4	10.6	1%	
5	Sociable	Unsociable	5.6	10.4		38%
6	Self-assured	Uncertain of himself	8.4	9.1		
7	High intelligence	Low intelligence	4.8	5.1		
8	Popular	Unpopular	4.0	7.4		
9†	Good natured	Irritable	9.4	12.0	1%	84%
10	Generous	Ungenerous	8.2	9.6	5%	94%
11	Humorous	Humorless	8.3	11.7	1%	91%
12	Important	Insignificant	6.5	8.6		13%
13†	Humane	Ruthless	8.6	11.0		99%
14†	Submissive	Dominant	13.2	14.5	5%	86%
15	Will go far	Will not get ahead	4.2	5.8		31%

*Given for all qualities common to Asch's list and this set of rating scales. †These scales were reversed when presented to the subjects.

Two important phenomena are illustrated in these free description protocols, the first of them having been noted by Asch. *Firstly*, the characteristics of the stimulus person are interpreted in terms of the pre-cognition of warmth or coldness. For example, a "warm" observer writes about a rather shy and retiring stimulus person as follows: "He makes friends slowly but they are lasting friendships when formed." In another instance, several "cold" observers described him as being, "... intolerant: would be angry if you disagree with his view. . . ."; while several "warm" observers put the same thing this way: "Unyielding in principle, not easily influenced or swayed from his original attitude." *Secondly*, the pre-information about the stimulus person's warmth or coldness is evaluated and interpreted in the light of the direct behavioral data about him. For example, "He has a slight inferiority complex which leads to his coldness," and "His conscientiousness and industriousness might be mistaken for coldness." Examples of these two phenomena occurred rather infrequently, and there was no way to evaluate the relative strengths of these counter-tendencies. Certainly some such evaluation is necessary to determine the conditions under which behavior which is contrary to a stereotyped label resists distortion and leads to rejection of the label.

The free report impression data were analyzed for only one of the sections. In general, there were few sizable differences between the "warm" and "cold" observers. The "warm" observers attributed more nervousness, more sincerity, and more industriousness to the stimulus person. Although the frequencies of comparable qualities are very low because of the great variety of descriptions produced by the observers, there is considerable agreement with the rating scale data.

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specific dimension of any given rating scale and the central quality of "warmth" or "coldness." Even though the rating of intelligence may be influenced by a halo effect, it is not influenced to the same degree to which consideration is made to make sense to view such strongly influenced items as considered in terms of this relation to warmth and hence more dynamically more closely related to warmth and hence more perceived in terms of this relation than in terms of a general positive or negative feeling toward the stimulus person. If first impressions are normally made in terms of such general dimensions as "warmth" and "coldness," the power they give the observer in making predictions and specific evaluations about such disparate behavior characteristics as formality and consideration is considerable (even though these predictions may be incorrect or misleading).

A comparison of the data from the two different stimulus persons is pertinent to the last point in so far as it indicates the interaction between the properties of the stimulus person and the label. The fact that the warm-cold variable generally produced differences in the same direction for the two stimulus persons, even though they are very different in personality, behavior, and mannerisms, indicates the strength of this variable. However, there were some exceptions to this tendency as well as marked differences in the degree to which the experimental variable was able to produce differences. For example, stimulus person A typically appears to be anything but lacking in self-esteem and on rating scale 4 he was generally at the "proud" end of the scale. Although the "warm" observers tended to rate him as they did the other stimulus person (i.e., more "modest"), the difference between the "warm" and "cold" means for stimulus person A is very small and not significant as it is for stimulus person B. Similarly, stimulus person B was seen as "unpopular" and "humorless," which agrees with his typical classroom behavior. Again the "warm" observers rated him more favorably on these items, but their ratings were not significantly different from those of the "cold" observers, as was true for the other stimulus person. Thus we see that the strength or compellingness of various qualities of the stimulus person must be reckoned with. The stimulus is not passive to the forces arising from the label but actively resists distortion and may severely limit the degree of influence exerted by the preinformation.³

2. *Influence of warm-cold variable on interaction with the stimulus person.* In the analysis of the frequency with which the various students took part in the discussion led by the stimulus person, a larger proportion of those given the "warm" preinformation participated than of those given the "cold" preinformation. Fifty-six per cent of the "warm" subjects entered the discussion, whereas only 32 per cent of the "cold" subjects did so. Thus the expectation of warmth not only produced more favorable early perceptions of the stimulus person but led to greater initiation of interaction with him. This relation is a low one, significant at between the 5 per cent and 10 percent level of confidence, but it is in line with the general principle that social perception serves to guide and steer the persons' behavior in his social environment.

As would be expected from the foregoing findings, there was also a relation between the favorableness of the impression and whether or not the person participated in the discussion. Although any single item yielded only a small and insignificant relation to participation, when a number are combined the trend becomes clear cut. For example, when we combine the seven items which were influenced to a statistically significant degree by the warm-cold variable, the total score bears considerable relation to participation, the relationship being significant as well beyond the 1 per cent level. A larger proportion of those having

favorable total impressions participated than of those having unfavorable impressions, the bi-serial correlation between these variables being .34. Although this relation may be interpreted in several ways, it seems most likely that the unfavorable perception led to a curtailment of interaction. Support for this comes from one of the other studies in this series (3). There it was found that those persons having unfavorable impressions of the instructor at the end of the first class meeting tended less often to initiate interactions with him in the succeeding four meetings than did those having favorable first impressions. There was also some tendency in the same study for those persons who interacted least with the instructor to change least in their judgments of him from the first to later impressions.

It will be noted that these relations lend some support to the autistic hostility hypothesis proposed by Newcomb (7). This hypothesis suggests that the possession of an initially hostile attitude toward a person leads to a restriction of communication and contact with him which in turn serves to preserve the hostile attitude by preventing the acquisition of data which could correct it. The present data indicate that a restriction of interaction is associated with unfavorable preinformation and an unfavorable perception. The data from the other study support this result and also indicate the correctness of the second part of the hypothesis, that restricted interaction reduces the likelihood of change in the attitude. What makes these findings more significant is that they appear in the context of a discussion class where there are numerous induced and own forces to enter the discussion and to interact with the instructor. It seems likely that the effects predicted by Newcomb's hypothesis would be much more marked in a setting where such forces were not present.

SUMMARY

The warm-cold variable had been found by Asch to produce large differences in the impressions of personality formed from a list of adjectives. In this study the same variable was introduced in the form of expectations about a real person and was found to produce similar differences in first impressions of him in a classroom setting. In addition, the differences in first impressions produced by the different expectations were shown to influence the observers' behavior toward the stimulus person. Those observers given the favorable expectation (who, consequently, had a favorable impression of the stimulus person) tended to interact more with him than did those given the unfavorable expectation.

Asch, S. E. Forming impressions of personality. *Journal of Personality*, 1946, 41, 258-290.

The Asch should that our positive and negative impressions can affect the direction of our judgments

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Social cognition, the topic of this chapter, deals with how people make sense of the world around them, as well as understanding themselves. How we make sense of all of this depends on a variety of factors, including the ways in which we tend to process information. Some of the ways that we tend to process information are subject to certain biases, some of which were discussed in Article 7 in this chapter. However, another important source of information that we use in making judgments about ourselves and the world around us is our memories. Our recollections of how someone treated us or some experience we've had not only help to shape our memories of those events but also influence how we understand ourselves and the world at present. For example, if you recalled that someone treated you very badly in the past it stands to reason that how you deal with them in the present may be influenced by that memory.

But how accurate are our memories of past events? Most of us take for granted that our memories are accurate recollections of those events, much like a photograph is a visual representation of a scene. Yet research shows that memories are dynamic, not static, things and undergo changes and distortions as time goes by. Nonetheless, even though we may intellectually acknowledge that our memories might not be "perfect" recollections of the past, we still might feel that they are fairly accurate recollections of those events.

Yet what if the memory you so clearly have is not accurate at all? In fact, that it is a totally false recollection that you nonetheless feel is true? If such *false memories* are possible, how might we acquire them? Over the past years, a good amount of media attention was given to people who had what was termed "recovered memories" that is, memories that had long been forgotten but somehow had been recovered, usually in the process of therapy. These recovered memories could be about anything, but often centered on some long-forgotten (or repressed) traumatic memory, such as concerning sexual abuse or physical abuse. Based on these recovered memories, individuals have been motivated to take the alleged wrongdoers to court to address the abuse.

But just because a memory is "recovered" in the process of therapy, does that mean that that memory is true? It may be, but then again it may have developed in response to "suggestion" on the part of the therapist. There has been a growing body of literature on false memories that has demonstrated that totally false memories can be suggested to participants, who in turn internalize these memories as true. A pioneer in the field, Elizabeth Loftus, has demonstrated that various memories of events that never happened, such as being lost in a shopping mall or hospitalized when as a child, can be incorporated by the individual as a real memory of the event. The following article by Elke Geraters, Daniel M. Bernstein, Harald Merckelbach, Christel Linders, Linsey Raymackers, and Elizabeth F. Loftus continues the exploration of the development of false beliefs. Additionally, this article also explores how these false beliefs may have behavioral consequences. In other words, not only is the event recalled as being true (even though it is not) but that that supposed event also affects how people respond now and in the future to similar situations.

Lasting False Beliefs and Their Behavioral Consequences

■ Elke Geraters, Daniel M. Bernstein, Harald Merckelbach, Christel Linders, Linsey Raymackers, and Elizabeth F. Loftus

ABSTRACT

False beliefs and memories can affect people's attitudes, at least in the short term. But can they produce real changes in behavior? This study explored whether falsely suggesting to subjects that they had experienced a food-related event in their childhood would lead to a change in their behavior shortly after the suggestion and up to 4 months later. We falsely suggested to 180 subjects that, as children, they had gotten ill after eating egg salad. Results showed that, after this manipulation,

METHOD

Subjects

We falsely suggested to subjects that, as children, they had become ill after eating egg salad. We then examined whether this suggestion increased their confidence that this event had occurred and whether they avoided the target food, in both the short and the long term (i.e., after 4 months).

The subjects were 180 first-year undergraduates (135 women, 45 men; average age = 20.99, *SD* = 2.76) at Maastricht University in The Netherlands. Subjects were all screened to ensure that they did not have eating disorders. We randomly assigned subjects to one of two groups: Subjects in the egg-salad group (*n* = 120) received the false suggestion that they had gotten sick after eating egg salad as a child. The remaining 60 subjects were in the control group and did not receive this false suggestion. All instructions were given in Dutch.

Materials and Procedure

Subjects initially signed up for a study called "Food and Personality." After 4 months, they were recontacted by a different experimenter, who asked them to enroll in an allegedly separate study.

During the first session, subjects completed a 24-item food-history inventory (Bernstein et al., 2005b) containing the critical event, "got sick after eating egg salad." They rated whether or not each event on this inventory happened to them before their 10th birthday, using a scale ranging from 1 (*definitely did not happen*) to 8 (*definitely did happen*). Subjects also completed a questionnaire about their food preferences, rating how much they liked to eat 62 different foods, including egg salad. Finally, subjects imagined being at a party with a variety of foods and beverages available and indicated their likelihood of consuming each of 20 options, including the critical item, egg salad. During the second session, which occurred exactly 1 week later, subjects received false feedback about their responses to the questionnaires that they had completed during the first session. We falsely told subjects that we had entered their responses into a computer that had then generated a profile of their early childhood experiences with certain foods. We told subjects that, as young children, they disliked Brussels sprouts, enjoyed eating pizza, and felt happy when a classmate brought sweets to school. Additionally, subjects in the egg-salad group were told, "You got sick after eating egg salad." To ensure that subjects in this group thought about this feedback, we told them that the computer randomly selected one feedback item for them to elaborate on, and that the item was egg salad (for a detailed description of the materials and procedure, see Bernstein et al., 2005a). Control subjects responded to a filler item.

Laboratory research has demonstrated that human memory can be remarkably fragile and even inventive. Studies on false memories and beliefs, for example, have compellingly shown that misleading information can lead to the creation of recollections of entire events that have not occurred (Loftus, 2005). In one of the first studies on this issue, subjects were led to believe that when they were children, they had been lost in the shopping mall for an extended period of time before being reunited with their parents (Loftus & Pickrell, 1995). In subsequent work, subjects falsely remembered even more unusual or upsetting events, such as spilling a punch bowl at a wedding (Hyman, Husband, & Billings, 1995), having a ride in a hot-air balloon (Wade, Garry, Read, & Lindsay, 2002), or even having been hospitalized as a child (Raymaekers, 2005).

Salient real-life examples of mistremembering the past are cases in which people have falsely recovered memories of childhood sexual abuse, often instigated by suggestive therapeutic techniques (Geraerts et al., 2007; Loftus & Davis, 2006). People also claim to have recovered memories of more inconceivable experiences, including memories involving satanic ritual abuse (Scott, 2001), previous lives (Peterson, Horstelenberg, Jelicic, & Mackelbach, 2007), and abduction by space aliens (Clancy, 2005), and such memories are often recovered during suggestive therapy as well. Even though such memories may not be real, they sometimes cause emotional pain similar to that of people who have experienced a traumatic event (McNally et al., 2004). This can have behavioral consequences, such as suing the alleged perpetrator after recovering memories of childhood abuse.

Strikingly, although a clear link between beliefs and behavior has been found repeatedly (Ajzen, 2005), laboratory research, at least now, has not examined the possible effects of false memories on behavior. Can false beliefs be sufficiently strong to alter behavior? If one develops false memories in the laboratory, might they have an influence on one's short- and long-term attitudes and actions? Recently, Bernstein, Laney, Morris, and Loftus (2005a, 2005b) took the first steps toward answering this question by developing a procedure for examining the effects of false memories and beliefs. Their subjects received the false suggestion that they had become ill after eating a certain food (e.g., hard-boiled eggs, strawberry ice cream) when they were children. The false suggestion increased subjects' confidence that the critical event had occurred. Moreover, the false belief resulted in decreased self-reported preference for the target food and in increased anticipated behavioral avoidance of that food.

These findings clearly demonstrate that false beliefs can influence attitudes. A remaining question, though, is whether memories produce real changes in behavior. The present study explored whether falsely suggesting to subjects that they had experienced a food-related event in their childhood would lead to a quantifiable change in their behavior. We examined whether lasting false beliefs can have consequences with respect to particular eating habits.

After this elaboration phase, subjects again completed the food-history inventory, food-preferences questionnaire, and party-behavior questionnaire. Responses on these questionnaires were used to determine whether there were changes in (a) subjects' confidence that the critical event had happened in their childhood and (b) their avoidance of the critical item. Subjects also completed a memory-belief form with questions pertaining to three events from the food-history inventory, including the critical item. They were asked to indicate whether they had a specific belief or memory of each of these events from before age 10. If they had a specific memory of an event, they wrote "M" and gave as many details as possible, and if they believed the event happened but had no specific memory of it, they wrote "B" and explained why they believed the event happened. If they were positive that the event did not happen, they wrote "P" and explained why they were so sure that the event did not happen. Finally, subjects were taken in small groups to another room, where they received a bogus debriefing. In the beginning of this 15-min period, subjects were told that the researchers wanted to thank them for their participation by providing a treat, and a catering company brought in drinks and sandwiches with five different fillings: egg salad (critical item), tuna salad, chicken salad, cheese, and ham. While the alleged debriefing was given, the experimenter, who did not know the group to which each subject had been assigned, recorded what type of sandwiches the subjects chose.

After 4 months, another experimenter recontacted the subjects to recruit them for an allegedly separate study at another laboratory at Maastricht University. In total, 153 (85%) subjects agreed to participate. They were told that this study (in reality, the third session) involved a taste test designed to examine people's preferences for certain types of food. The procedure of this taste test was adapted from the methods of Herman and Polivy (1980).

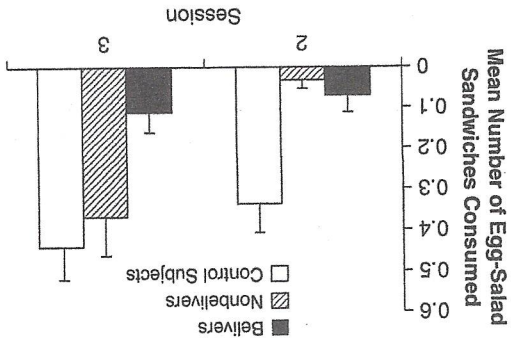
Subjects were asked to evaluate five different types of fruit-flavored water (lime, raspberry, tropical punch, apple, and tangerine) and five types of sandwiches (ham, cheese, chicken salad, tuna salad, and egg salad), using 8-point scales to rate them for appearance, smell, flavor, and food preference. While preserving quantity, we ensured that the sandwiches had a different appearance than in the second session so as not to remind subjects of that session. Next, subjects were instructed to complete three (filler) questionnaires. They were also told that the residual food would be thrown away, and that they should feel free to consume as much as they wanted. After 15 min, the food was removed. Subjects then again completed the food-history inventory, food-preferences questionnaire, party-behavior questionnaire, and memory-belief form. We changed the layout of all these questionnaires so as to disguise the link with the previous sessions.

After completing the questionnaires, subjects were asked what they thought the purpose of the new study was and

Confidence and Preference

Subjects were considered to have arguably true memories (a) if they both scored above the midpoint for the critical item on the food-history inventory during the first session and reported a belief or memory for the critical egg-salad event or (b) if their parents confirmed that they had gotten sick after eating egg salad as a child. Five subjects met these criteria¹ and were excluded from analyses. After these subjects were excluded, the remaining sample consisted of 117 subjects in the experimental group and 58 subjects in the control group. Next, in the egg-salad group, we identified subjects who were believers ($n = 41$) and nonbelievers ($n = 58$; see Morris, Laney, Bernstein, & Loftus, 2006). Subjects were considered believers if they met two criteria: Their confidence that the critical event happened had to increase after they received the false feedback, and they had to report a belief form (3 believers, 7% reported a memory, rather than a belief). Nonbelievers were subjects whose confidence that the critical egg-salad event had happened remained the same or decreased after they received the false feedback. Of the 153 subjects who returned to the lab for the third session, 35 believers, 54 were nonbelievers, and 50 were control subjects. Results for the attitudinal measures replicated previous findings (e.g., Bernstein et al., 2005a): Although responses to the food-history inventory showed no group differences in subjects' confidence that the critical egg-salad event had happened, responses in both the second and the third sessions, after subjects in the egg-salad group had received the false feedback, indicated that believers were significantly more confident that they had gotten sick from eating egg salad than nonbelievers and control subjects were, all $ts > 11.73$, all $ps < .001$ (see Figure 1a). Believers experienced this event increased an average of 3.29 points on the 8-point scale, $t(40) = 11.95$, $p < .001$, $d = 2.32$. Also, in both sessions after the false feedback, believers reported significantly less preference for egg salad on the food-preferences and party-behavior questionnaires than did nonbelievers and

FIGURE 2A / Mean number of egg-salad sandwiches consumed by believers, nonbelievers, and control subjects in the second and third sessions. Error bars represent standard errors of the means.



suggested to subjects that, as children, they had become ill after eating egg salad. After this manipulation, a significant minority of our subjects came to believe they had experienced this event. More important, this newfound autobiographical belief was accompanied by significantly reduced consumption of egg-salad sandwiches, both immediately and 4 months after the false suggestion.

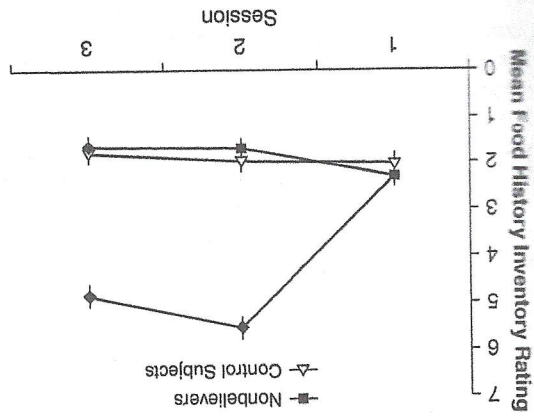
Our findings show that, at least in the short term, simply having received the false feedback deterred both believers and nonbelievers from actually eating egg salad. Thus, they exhibited a *contagion effect* (Rozin & Fallon, 1987). That is, all subjects who received the false feedback must have been reminded of what it must feel like to become ill after eating egg salad. This finding also indicates that suggestions about the past may have more persistent effects on behavior than on self-reports, at least in the short term. Such a dissociation between behavior and self-reports is a well-known phenomenon in social psychology (Greenwald et al., 2002).

However, in the third session, we found a significant difference between believers and nonbelievers in their consumption of egg-salad sandwiches. That is, the false feedback that was given 4 months earlier did not seem to have had a lasting effect on nonbelievers, who are more egg-salad sandwiches than believers did at this session. It is possible that believers had been contemplating the egg-salad event and had consequently created memories about having gotten ill after eating egg salad as a child. Of course, we cannot prove the falseness of the reports subjects provided. One could definitely claim that the manipulation triggered true memories rather than creating false ones. However, because we sought corroboration from subjects' parents, we can be fairly certain that the subjects whose data we analyzed did not experience the critical event when they were children.

Our findings demonstrate that it is possible, in at least a significant minority of adult subjects, to induce lasting false

fewer egg salad sandwiches were eaten

FIGURE 1A / Subjects' mean confidence that they had gotten ill after eating egg salad as a child, as a function of session. Session 1 was before the false suggestion, Session 2 was 1 week later, and Session 3 was 4 months later. Results are shown separately for subjects who believed the false suggestion, subjects who did not believe the false suggestion, and control subjects (who were not exposed to the false suggestion). Error bars represent standard errors of the means.



findings concerning whether the false suggestion of egg-salad eating behavior. In fact, the groups differed in both the number of egg-salad sandwiches eaten in the second session, $t(97) = 12.45, p < .001, \eta^2 = .14$, and in the third session, $t(97) = 3.55, p = .05, \eta^2 = .031$. Specifically, in the second session, believers and nonbelievers both ate fewer egg-salad sandwiches than did control subjects, $t(97) = 3.10, p = .003, d = 4.32, p < .001, d = 0.81$, respectively, but did not differ significantly ($t < 1$). In the third session, believers ate fewer egg-salad sandwiches than did both control subjects, $t(97) = 2.08, p = 0.041, d = 0.44$, and control subjects did not differ in their consumption of egg-salad sandwiches, all $F_s > 1.38, p_s > .25$.

ENDING BEHAVIOR

Finally, during the taste testing in the third session, believers gave the egg-salad sandwiches lower ratings of appearance and flavor than did nonbelievers and control

separate egg-salad session. Session 1 was before the false suggestion, Session 2 was 1 week later, and Session 3 was 4 months later. Results are shown separately for subjects who believed the false suggestion, subjects who did not believe the false suggestion, and control subjects (who were not exposed to the false suggestion). Error bars represent standard errors of the means.

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2) There is a belief that one should eat certain foods due to fat contents. When we see foods we may shy away from it because we have a fear of gaining more or not losing weight. The actuality is that we eat all

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 Providers know if we are at healthy weights or not. We should let our providers tell us if we are overweight. I pray we are overweight than we should then see a nutritionist and Herman, C.R., & Foley, J. (1980). Experimental and clinical aspects of restrained eating. In A. Stunkard (Ed.), *Obesity: Basic mechanisms and treatment* (pp. 208-225). Philadelphia: W.B. Saunders.
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ENDNOTES

¹Excluding these subjects from analyses did not change the results. Note that no subjects had yet completed courses on memory or false memory. Previous findings showed that social desirability could not account for significant variance in effects of false beliefs on attitudes (e.g., Laney, Bowman Fowler, Nelson, Bernstein, & Loftus, in press).
²The egg-salad memories of all 5 subjects who met the first criterion were also confirmed by their parents.
³Complete reports of the analyses are available from the first author.

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ACKNOWLEDGMENTS

Elke Gerarts was supported by a grant from the Netherlands Organization for Scientific Research (NWO 451 07 004).
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 childhood events can profoundly change people's attitudes and behavior.
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Obviously, attitudes are formed in a great variety of ways. Some are the result of direct experience. For instance, we meet someone from a certain country and, based on that limited experience, form an attitude (or stereotype) about people from that country. In other words, we generalize our experience to form an attitude. In many other cases, however, we do not experience the person, situation, or event directly but rather indirectly. These so-called *secondhand attitudes* are the result of information we received from someone else, such as our parents or friends. In fact, this kind of information is a major source of our beliefs. Typically, attitudes are comprised of three components. First, there is a *cognitive* or *belief* component, which is what we believe is or should be true. Second, there is an *affective* or *emotional* component, where we not only believe something to be true, but we also feel very strongly about it. Finally, an attitude may also include a *behavior tendency*: We strongly tend to avoid doing things that violate our belief and affective components. Based on an accumulating body of evidence from a variety of fields, there is a growing awareness that human activities result in significant, and potentially catastrophic, changes in the climate. The overwhelming scientific consensus is that if we continue doing what we have been doing, then we might wreak havoc on the world in which we live. But many of these experts also believe that even if we can't totally undo the damage already done, we can at least mitigate our negative impact on the environment. How people respond to this growing environmental crisis is influenced by their attitudes, which, as mentioned earlier, have belief, emotional, and behavioral components. That is, the way people respond to the environment is determined by their beliefs about various environmental issues, how emotionally invested they are in those issues, and ultimately how they behave toward the environment. Psychology has accumulated a great amount of knowledge about how attitudes and behaviors are effectively changed. The following article by Michael Price discusses how some of these psychological principles might be employed to change people's awareness of and behavior toward their environment.

Changing Behaviors by Degrees

Michael Price

And it's also an opportunity for psychologists to showcase tangible effects of their skills, he adds. "Let's show the public we can make a real contribution," Kazdin says. "We have the knowledge—there's no question about that—but we need to show we can get some things done."

SPREADING THE WORD

For starters, that means convincing people to reduce their energy consumption. The American Geophysical Union, a scientific society composed of more than 50,000 earth scientists, teachers and students, issued a statement in January emphasizing that climate change is intimately tied to human energy use, and that successfully reducing our energy usage will depend upon the willingness of scientists, industries, governments and the public to work together. According to the U.S. Environmental Protection Agency and the Department of Energy, if every household in the country replaced a single normal light bulb with an energy-efficient compact

Copyright © 2008 by the American Psychological Association. Reproduced with permission. Price, M. (2008). Changing behavior by degrees. *Monitor on Psychology*, 39(3), 48-51.

fluorescent light bulb, it would reduce greenhouse gas emissions by an amount equivalent to that produced by 800,000 cars.

But convincing large numbers of people to act in concert is not easy. For one thing, there's a lot of confusion and misinformation out there, says Christie Manning, PhD, a visiting cognitive psychology professor at Macalester College in St. Paul, Minn., who also contributes to a Web site, www.teachgreenpsych.com, dedicated to helping instructors incorporate conservation topics in the classroom.

"People actually aren't aware of the extent to which their actions are contributing to environmental problems," she says. For example, people don't realize that eating a meat-heavy diet contributes more to climate change than not recycling, says Manning. And while recycling is well and good, she says, a more effective way to help the environment would be to eat less meat—a message that isn't as firmly entrenched in the public consciousness.

Responsibility for getting the word out about effective environmental solutions doesn't fall exclusively to psychologists, but they can and should do their part, says Britain Scott, PhD, a psychologist at the University of St. Paul. Scott, who founded www.teachgreenpsych.com, advises academic psychologists to teach their students about the importance of sustainability.

"We have the opportunity—and the responsibility—to educate tomorrow's conservation scientists, policymakers and grassroots activists about the fundamental connections between human behavior and the environmental crisis," she says. Scott's St. Thomas colleague Elise Amel, PhD, encourages psychologists to hold seminars for the public and for teachers in other disciplines to help them bring conservation into their classrooms, too. Manning urges psychologists to reach out to their communities by helping local "green" organizations to fine tune their messages.

PEER PRESSURE

But even when people do have all the right information, they still don't often act on it. "Information by itself is not enough," says Robert Cialdini, PhD.

"You have to motivate people to use it." Cialdini, an Arizona State University psychology professor who studies the science of persuasion, is putting his research to work for the planet. One of the most effective motivators he's found is a positive version of the classic adage "If everyone jumped off a bridge, would you?" By manipulating what people perceive as social norms, Cialdini says, you can achieve remarkable behavioral changes.

In a 2007 study, for example, Cialdini experimented with the wording on door-hanger notices encouraging people to conserve energy. One notice urged residents to think about their effect on the environment. Another informed them how much money they could save by using fans instead of their air conditioning. A third implored them to consider future gener-

ations. The fourth and final notice told residents that most of their neighbors actively conserved energy. Cialdini and his team distributed these door hangers randomly, then waited to see what, if any, the effects on energy conservation would be.

The first three notices—the appeals to the environment, money and future generations—all fell flat, achieving essentially no energy conservation. The final one, though, made a big difference. On average, those households dropped their energy usage by nearly two kilowatt-hours per day—a 10 percent reduction in daily power usage.

The study results reinforce mounting evidence for the theory that people, as social beings, rely far more on social cues than informational ones. "There's an evolutionary explanation for it," Cialdini says. "The most primitive way we've developed to make decisions is to watch what other people in similar situations are doing."

These subtle cues can, of course, swing both ways. Well-intentioned environmental messages can have negative effects if they hype the idea that many people are contributing to the problem, he says. A public service announcement that proclaims, "So many people today are littering that the aluminum cans lying on our streets would stretch to the moon and back would do more harm than good because it normalizes littering," Cialdini says. Instead, psychologists should make litterers feel as if they're in the minority, he advises.

Cialdini is publishing these findings not just in psychology journals, but in hotel-management publications, consumer research journals and popular-magazines—for anyone who will listen, basically.

OVERCOMING OBSTACLES

Psychologists can also address shortcomings where the potential for positive change exists but people, for whatever reason, are hesitant to embrace that potential. Raymond Nickerson, PhD, offers e-mail as an example of an environmental promise yet to be delivered. Nickerson, a psychologist at Tufts University whose 2003 book "Psychology and Environmental Change" discusses these topics, says that despite the Internet Age's ability to reduce our paper consumption, people are still using just as much paper as ever—and possibly even more, according to some studies.

"This so-called 'paperless society' we've heard about hasn't really worked out," Nickerson says. "Ironically, it may have done the opposite. People prefer to read things on paper as opposed to a computer screen, and e-mail and the Internet have made it easier to just print it off."

Psychologists are investigating whether this is just a general thing—Nickerson suspects younger people who've grown up reading on the computer might be less averse to electronic displays—or if the displays themselves are the problem. This disconnect between innovation and environmental intention illustrates an important point: You can't predict exactly how people are going to use new technologies, Nickerson

Using Society - Media to make

It's believe everyone also doing it well

But even when people do have all the right information, they still don't often act on it. "Information by itself is not enough," says Robert Cialdini, PhD.

who chairs the U.S. House of Representatives Subcommittee on Research and Science Education. Industry regulations and financial motivation will eventually have to reflect a green outlook on production if we expect any lasting changes. But adjusting policy takes time and is largely dependent on the ebb and flow of politics—not really an option when catastrophic consequences loom low on the horizon.

To that end, the field of ecopsychology promotes a less egocentric mode of thinking in favor of a more eco-centric one. By encouraging humans to rethink their position in the natural world, some psychologists believe they can influence people to be more responsible stewards of nature.

"Attitudes toward nature are very important," Nickerson says. "For instance, hikers and snowmobilers both use mountains recreationally, but hiking is generally less damaging to the ecosystem, he says. A hobby like hiking, ecopsychologists say, fosters a positive, self-inclusive attitude toward nature that reflects in other behaviors, as well. It's one more tool psychologists can use to promote environmental responsibility.

Baird recognizes that behavioral and attitudinal change is ultimately what's going to make or break the plan, and that's where psychologists need to step up their game.

"If psychologists just spend their time talking to each other about esoteric topics," says Baird, "they'll have no impact on communities, go to town hall meetings, craft a strategy and become activists, then they can make a difference."

Kazdin agrees, saying APA can serve as a sort of clearing-house for pro-environmental psychological approaches. Members can talk with staff of APA's directorates and devise a plan for how their individual talents map onto the overarching goals of conservation and sustainability. Kazdin believes APA's depth of experience and diversity makes it a natural choice for coordinating joint research projects between different fields and then disseminating information.

"By mobilizing our own group and bringing in diverse people, we can provide a science-based technology for effecting change," he says.

says. Just because an industry produces an environmentally friendly product doesn't mean that it will be used that way.

"If the technology gives you the promise but no one wants to use it, that's a tough obstacle," Nickerson says. "That's a psychological issue."

Of course, psychologists can't do it alone. They, like the rest of the world, rely largely on the research of climate scientists, oceanographers, geologists and other physical scientists whose job it is to assess what behaviors are causing damage, and the risks associated with them. But Cialdini considers psychologists to be the arbiters of this information, charged with turning that research into action when it hits the public.

PIVOTAL MOMENT

These changes need to come quickly, though. Global warming is not something scientists can debate anymore, says psychologist Brian Baird, PhD (D-Wash.), who in January traveled to Antarctica, the Great Barrier Reef and an Australian rainforest to witness firsthand the effects of climate change. One disconcerting sight, Baird reports, was seeing the devastation to the expansive coral reefs off the northeast Australian coast. In response to rising ocean temperatures and increased ocean acidification, the reefs are losing the unicellular algae that they rely upon for photosynthesis. There's about a 50 percent probability that all of the world's coral reefs could die within 50 years, Baird says.

He likens the immobile coral's predicament to our own: "The reef can't get up and move to a new climate, and we can't move to a better place. Changing public policy is one way to get people to be more environmentally conscientious, says Baird,

CRITICAL THINKING QUESTIONS

1. According to the article, "By encouraging humans to rethink their position in the natural world, some psychologists believe they can influence people to be more responsible stewards of nature." Using information from this article as well as other thoughts you may have, how might this be effectively accomplished? Identify one behavior on campus that relates to an environmental-impact issue. Design a procedure for trying to change that behavior in a more environmentally conscious way. Be sure to discuss *why* your methods might be likely to succeed.
3. The article identifies several examples of approaches to changing attitudes toward the environment that might not only be ineffective but may actually result in a change in the undesired direction. What are they? Can you find any examples from the media or from your own personal experiences that might be ineffective attempts at attitude and/or behavior change?
4. Discuss two beliefs or behaviors regarding the environment that have changed over the course of your lifetime. When and why did each of these beliefs or behaviors change? Is there any particular reason each changed when it did rather than, say, 50 years before? Explain your answers.

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In the years since publication of Festinger and Carlsmith's classic study (Article 11), many experiments have been conducted to test dissonance theory and to elaborate on the conditions necessary for its operation. As it turns out, there are many different causes of dissonance. For example, dissonance may be aroused when an individual puts a great deal of effort into a given activity, as though he or she needs to justify expending so much effort to obtain a certain goal. This is sort of a "suffering leads to liking" effect. Dissonance will also likely be aroused when an individual has the freedom to choose whether to do (or not do) something. There is little reason to experience dissonance when you are forced to do something. You know why you did it: Someone made you do it. Finally, issues such as self-esteem may influence the arousal (and subsequent reduction) of cognitive dissonance. People with high levels of self-esteem may actually be more likely to engage in dissonance reduction than those with low levels of self-esteem when they see their behavior as inconsistent with their beliefs.

The central premise of cognitive dissonance theory is that people are motivated to avoid or reduce any tension produced by a perceived inconsistency between two attitudes or between an attitude and a behavior. So, what would happen when someone encounters a persuasive argument that is contrary to his or her own privately held beliefs? Dissonance theory suggests that this person will be motivated to reduce the internal tension generated by that perceived inconsistency, which can be accomplished in several ways. For example, he or she simply might not pay attention to the opposing viewpoint, distort the message to make it more consistent with his or her own beliefs, or avoid the message altogether.

But why does cognitive dissonance exist in the first place? Is it a mental process that we learn as we mature and a reflection of our increasing complex cognitive abilities? Or is it something fundamentally more basic that occurs earlier in life? In fact, is it possible that even some nonhuman primates are capable of engaging in cognitive dissonance reduction processes? The following article by Louisa C. Egan, Laurie R. Santos, and Paul Bloom addresses this issue of the origins of cognitive dissonance and whether such processes may be found not only in children but also in monkeys. The developmental and evolutionary implications of their findings are interesting.

The Origins of Cognitive Dissonance

■ Louisa C. Egan, Laurie R. Santos, and Paul Bloom

ABSTRACT

In a study exploring the origins of cognitive dissonance, preschoolers and capuchins were given a choice between two equally preferred alternatives (two different stickers and two differently colored M&M's[®], respectively). On the basis of previous research with adults, this choice was thought to cause dissonance because it conflicted with subjects' belief that the two options were equally valuable. We therefore expected subjects to change their attitude toward the unchosen alternative, deeming it less valuable. We then presented subjects with a choice between the unchosen option and an option that was originally as attractive as both options in the first choice. Both groups preferred the novel over the unchosen option in this experimental condition, but not in a control condition in which they did not take part in the first decision. These

results provide the first evidence of decision rationalization in children and nonhuman primates. They suggest that the mechanisms underlying cognitive dissonance reduction in human adults may have originated both developmentally and evolutionarily earlier than previously thought.

Cognitive dissonance is one of the most heavily studied phenomena in the history of psychology. The term *cognitive dissonance* describes a psychological state in which an individual's cognitions—beliefs, attitudes, and behaviors—are at odds (Festinger, 1957). People experience cognitive dissonance as aversive (Elliot & Devine, 1994), and are motivated to resolve the inconsistency between their discrepant cognitions. Psychologists have long been interested in the nature of cognitive dissonance, as this phenomenon has implications for many areas

Egan, L.C.; Santos, L.R.; & Bloom, P. (2007). *Psychological Science*, 18(11), 978-983. Copyright © 2007 by Association for Psychological Science. Reprinted by permission of SAGE Publications.

of psychology, including attitudes and prejudice (e.g., Leippe & Eisenstadt, 1994), moral cognition (e.g., Tsang, 2002), decision making (e.g., Akert & Dickens, 1982), happiness (e.g., Lyubomirsky & Ross, 1999), and therapy (Axson, 1989).

Unfortunately, despite long-standing interest in cognitive dissonance, there is still little understanding of its origins—both developmentally over the life course and evolutionarily as the product of human phylogenetic history. Does cognitive-dissonance reduction begin to take hold only after much experience with the aversive consequences of dissonant cognitions, or does it begin earlier in development? Similarly, are humans unique in their drive to avoid dissonant cognitions, or is this process older evolutionarily, perhaps shared with nonhuman primate species?

To date, little research has investigated whether children or nonhuman primates experience and strive to reduce dissonance. In one welcome exception in the developmental literature, Aronson and Carlsmith (1963) found that 4-year-old children who obeyed an experimenter's mild warning not to play with an attractive toy later liked the toy less than did children who had obeyed an experimenter's severe warning not to play with the toy. Aronson and Carlsmith interpreted this result in terms of cognitive dissonance: Because children seek to make their attitudes consistent with their behaviors, when they followed the warning and avoided the toy, their liking for the toy decreased. This effect, however, relied on an induced behavior—obedience to an adult's admonition—rather than on more self-driven decisions on the part of the children. We believe that a demonstration that children shift their attitudes because of counterattitudinal self-driven behavior would provide clearer evidence that they are motivated to resolve cognitive dissonance in their everyday lives.

There is also relatively limited work on cognitive-dissonance reduction in other species, despite the fact that Festinger himself wondered about the extent to which animals experience dissonance. Indeed, Lawrence and Festinger (1962) postulated that cognitive dissonance could explain patterns of extinction across different reward conditions. In line with this suggestion, work on cognitive dissonance in nonhuman animals has exclusively employed variants of the effort-justification paradigm (see Aronson & Mills, 1959, for a version of this paradigm with human subjects). This research has led to mixed results. Lewis (1964), for example, demonstrated that rats who pulled a weight harder to obtain a food pellet ran faster to retrieve the pellet after the work was completed. Although Lewis explained these results in terms of cognitive dissonance, other researchers have argued that they could have been due to a simple transfer-of-effort effect: A rat who has just pulled a heavy weight may run faster than a rat who has pulled a light weight because it is physiologically aroused, not necessarily because it experiences greater anticipation of the reward (see Armus, 2001). In a study supporting this view, Armus (2001)

We hoped to develop a method that not only could be used with both children and monkeys, but also would provide an especially simple and direct test of cognitive-dissonance reduction—a test in which changes in behavior could clearly be attributed to attitude change per se, rather than alternative phenomena. To do this, we modified the free-choice paradigm pioneered by Brehm (1956). In the traditional free-choice paradigm, individuals rate the attractiveness of a variety of items. They are then given a choice between two items that they have rated as equally attractive. This choice is thought to induce dissonance because a decision to avoid the unchosen alternative conflicts with the many positive, preferred aspects of that alternative. After making the choice, subjects are asked to rerate all items. Typically, subjects will rerate items that they

observed no differential preferences for food pellets when one food was given in response to much work and another was given in response to limited work. This negative result suggests that rats may not strive to reduce cognitive dissonance, at least in the context of effort justification.

Other nonhuman species—particularly birds—have demonstrated effects similar to dissonance reduction in the context of effort-justification paradigms (*Stumus vulgaris*: Kacelnik & Marsh, 2002; *Columba livia*: Clement, Feltus, Kaiser, & Zentall, 2000; DiGian, Friedrich, & Zentall, 2004; Friedrich, Clement, & Zentall, 2004). For example, demonstrated that pigeons prefer to eat from a feeder that is associated with greater rather than lesser effort. The authors explained these results in terms of relative contrast effects: Pigeons who receive a piece of food after pecking many times experience a larger shift in relative hedonic status than those who simply receive a piece of food after pecking once (Friedrich & Zentall, 2004). Thus, the results of effort-justification studies of animals may be attributed to changes in the relative hedonic value of the reward, rather than changes to the animals' attitudes per se.

In the study reported here, we used a combined comparative-developmental approach to investigate both the developmental and the evolutionary origins of cognitive-dissonance reduction (see Hauser & Spelke, 2004). More specifically, we tested two populations—human children and nonhuman primates—on similar tasks to address the questions of how adult mechanisms for cognitive-dissonance reduction originate and when these mechanisms originated phylogenetically. This type of combined comparative-developmental approach has been used to investigate questions of origins in numerous domains of psychological inquiry, such as theory of mind (Tommasello, Call, & Hare, 2003; Tommasello, Carpenter, Call, Behne, & Moll, 2005), numerical cognition (Feigenson, Dehaene, & Spelke, 2004), and core physics knowledge (Hauser & Spelke, 2004; Spelke, 2000). In the present study, our goal was to examine whether children and nonhuman primates, like human adults, would shift their attitudes to fall in line with their decisions.

commercially available adhesive foam stickers of various shapes (e.g., dolphin, dragonfly, ladybug). Stickers are often used in preschools as rewards for good behavior, and the children were enthusiastic about playing with the stickers. The experimenter first familiarized the children with the rating scale, explaining that the face with the large smile corresponded to great liking, and the face with a straight line for a mouth corresponded to no liking, and the intermediate faces corresponded to liking that increased as the degree of smile increased. Children's comprehension of the scale was confirmed by appropriate responses to the experimenter's three queries: "Let's say I like a sticker a whole lot/not very much at all/somewhere in the middle. Which face should I put it with?" Two children from the original sample were replaced because they had difficulty understanding the rating scale, as indicated by repeated failures to match stickers to appropriate faces.

After the children demonstrated their understanding of the scale, they were asked to match a series of stickers to the faces on it. They continued performing these ratings until they appeared to become fatigued. Each child included in the sample rated stickers until the experimenter was able to identify at least two triads of stickers for which the child had equal liking (i.e., stickers the child had matched to the same face on the scale). Two children from the original sample became fatigued before two full triads could be identified, and were replaced.

Once a child had rated the stickers, the experimenter randomly labeled the stickers in each triad as A, B, and C. The child was then given choices involving each triad of stickers. Each child participated in one of two conditions, either the *choice* condition or the *no-choice* condition. In the *choice* condition, the child was given one choice between A and B. The experimenter displayed A in one hand and B in the other and said, "Now, you get to choose a sticker to take home." Next, the child was given a similar choice between the unchosen alternative (i.e., either A or B, depending on which option the child had chosen) and C (i.e., the novel yet equally preferred alternative). The experimenter continued with other triads of stickers until all available triads were exhausted.

In the *no-choice* condition, each child received either A or B. The experimenter displayed A and B in the choice condition and said, "Now, I'm going to give you a sticker to take home." The experimenter then randomly gave the child one of the

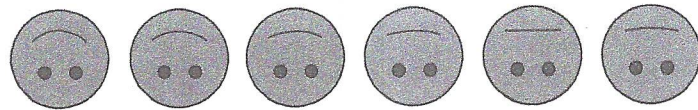


FIGURE 1 / Schematic of the smiley-face rating scale used with child subjects to assess their liking for stickers.

The experimenter assessed children's preferences for different stickers using a smiley-face rating scale that included six faces, corresponding to six levels of liking (see Fig. 1). We used

Procedure

The experimenter assessed children's preferences for different stickers using a smiley-face rating scale that included six faces, corresponding to six levels of liking (see Fig. 1). We used

the experimenter.

Child Study

METHOD

Subjects

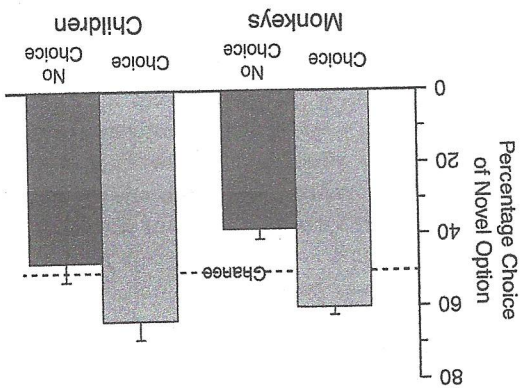
Thirty 4-year-olds ($M = 53.8$ months, $SD = 2.45$; 14 girls, 16 boys) participated in this study. Four other children began the study but did not complete it because of inability to understand the procedure or fatigue during resting. Children were recruited from a database of potential child subjects and from preschools and day-care centers in the New Haven, Connecticut, area. They were tested in the laboratory or in their preschools while seated on a carpeted floor across from the experimenter.

Adapting this free-choice methodology for use with nonverbal populations, we first assessed individuals' preferences for similar objects and determined three (A, B, and C) that were equally attractive. Next, subjects received a choice between A and B (Phase 1) and then a second choice between whatever they did not select (either A or B) and C (Phase 2). We predicted that if subjects experienced dissonance in choosing one equally preferred item over the other, then they would change their attitude toward the unchosen item, liking it less because of their decision. Therefore, in Phase 2, when they had a choice between it and another (originally preferred) option, they would choose the unchosen item less. Subjects also participated in a control condition in which we removed the intentional-choice phase: Rather than choose intentionally between A and B in Phase 1, subjects simply received one of the two alternatives from the experimenter. In this condition, subjects were not expected to experience dissonance—as they themselves never made a choice between the two items—and therefore were not expected to show a preference in Phase 2.

have chosen as more attractive, and items that they did not choose as less attractive, apparently changing their attitudes to fit with their choices. This rating pattern suggests that subjects change their present attitudes to be in line with their past decisions.

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FIGURE 3 / Mean percentage of choices of the novel but equally preferred option (C) in the novel and no-choice conditions, for monkeys and children. Error bars indicate standard errors.



(mean percentage choice of C = 38.3%; see Fig. 3). This pattern was confirmed by nonparametric analyses (paired sign: $p = .03$). In addition, the percentage of trials on which the monkeys chose C differed from chance in both conditions. A one-sample t test revealed that in the choice condition, the monkeys showed a significant preference for option C, $t(5) = 5.48, p = .003$. They showed the opposite preference in the no-choice condition, significantly preferring the unreceived over the novel option, $t(5) = 4.18, p = .009$. We did not anticipate this effect, but believe it may be attributable to the methodology of the no-choice condition: The monkeys saw the experimenter keep one option and give them the other. They may have interpreted this behavior as the experimenter choosing the better option for herself and offering them the inferior alternative. Such an interpretation may have caused them to inflate the value of the alternative "chosen" by the experimenter (see Lyons & Santos, 2007, for a similar finding).

DISCUSSION

Both children and capuchins demonstrated a decrease in preference for one of two equally preferred alternatives after they had chosen against it—but not when the experimenter had chosen against it. These results suggest that children and monkeys change their current preferences to fit with their past decisions. Like adult humans tested in similar paradigms, children and monkeys seem to derogate alternatives they have chosen against, changing their current attitudes and preferences to more closely match the choices they made in previous decisions. Our present findings fit with those of previous studies involving preference changes in both children and nonhuman species. Previous studies using the forbidden-roy paradigm

testing chamber and just beyond the monkey's reach. The experimenter placed the tray such that the monkey was able to see the two M&M's on the tray, but could not access them. After the monkey saw both items, the experimenter lowered the tray so that the monkey could choose one but not both of the options (see Fig. 2b). Immediately after the monkey made a choice, the tray was removed in order to prevent the monkey from gaining access to the other alternative. Then, the 10 test trials were presented; each provided a choice between the unchosen option (either A or B, depending on the monkey's choice) and the novel yet equally preferred option, C. The position of the chosen and novel options was randomized across the 10 test trials.

The no-choice condition was identical to the choice condition except for the initial choice trial. In the no-choice condition, the monkey had no choice between the two initially presented options; instead, the experimenter kept one of the two openings closed during the choice period (see Fig. 2c), allowing the monkey to take only one of the M&M's (either A or B). The experimenter then presented the monkey with 10 test trials involving decisions between the unreceived alternative and the novel option, C, as described for the choice condition.

RESULTS

We first analyzed the children's performance on the rating task. On average, children tested in the choice condition and those tested in the no-choice condition completed ratings for the same total number of trials ($ns = 4.13$ and 4.40 trials, respectively).

Next, for each child we computed a percentage preference for the novel option, C, over the unchosen (choice condition) or unreceived (no-choice condition) option A or B (e.g., a child who chose C for four out of five trials would have a percentage preference score of 80%). We then compared the mean percentage preference for C across the choice and no-choice conditions. An unpaired t test revealed a reliable difference between the two conditions, $t(28) = 2.03, p = .05$, two-tailed. As depicted in Figure 3, children in the choice condition were more likely to prefer option C (mean percentage choice of C = 63.0%) than were children in the no-choice condition (mean percentage choice of C = 47.2%). Average choice of C in the choice condition differed reliably from chance, according to a one-sample t test with a hypothesized mean of 50%, $t(14) = 2.28, p = .04$, two-tailed. This was not true for the no-choice condition, $t(14) = 0.53, p = .60$, two-tailed.

We performed similar analyses on the monkeys' percentage choice of option C. A repeated measures analysis of variance with condition (choice and no-choice) and order (first two sessions or second two sessions) as within-subjects variables revealed only a significant main effect of condition, $F(1, 5) = 32.5, p = .002$. The monkeys chose option C (mean percentage choice of C = 60.0%) more in the choice condition than in the no-choice condition.

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human adults may emerge as a result of developmentally and evolutionarily constrained systems that are consistent across cultures, ages, and even species.

The speculation that cognitive-dissonance reduction relies on core processes leads to other speculations concerning the nature of the mechanisms that drive it. Many core-knowledge mechanisms seem to operate in the absence of higher-level capacities that human adults possess, including language capacities, and also in the absence of social factors such as extensive teaching and socialization. It follows, then, that cognitive-dissonance reduction may not require these higher-level processes. One might further speculate that cognitive-dissonance reduction may be more automatic than has been previously suspected (see Liberman, Ochsner, Gilbert, & Schacter, 2001, for support of this view). The exact mechanisms behind cognitive-dissonance reduction have long been debated within social psychology: Whereas some researchers believe that dissonance is experienced as a threat to a cognitively and motivationally complex self (e.g., Steele & Liu, 1983), others argue that dissonance is due to much simpler processes (e.g., Bem, 1967; Festinger, 1957). If cognitive-dissonance reduction occurs in creatures that lack language and complex senses of self, then one must either accept that these processes are mechanistically simpler than previously thought or ascribe richer motivational complexity to populations that are thought to be less cognitively sophisticated than human adults, namely, monkeys and children.

Our study also has what we feel is an important methodological implication. Specifically, our work examining cognitive-dissonance reduction in monkeys and children illustrates the utility of incorporating comparative-developmental data in studying adult human social psychology and social psychological mechanisms. We hope that this study will pave the way for a more thorough investigation of the origins of some of the classic social psychological phenomena. Such an approach will allow researchers not only to determine the foundations of these phenomena in human development and evolution, but also to constrain hypotheses about the mechanisms underlying these phenomena.

ACKNOWLEDGMENTS

The authors would like to thank Justin Bellamy, Jeffrey Brown, Christina Jacovides, Elizabeth Moore, and Jessica Thomas for their help running the experiments and Geoffrey Cohen and Richard Eibach for helpful feedback on experimental design. This work was supported by Yale University. Animal Committee, and conforms to federal guidelines for the use of animals in research.

demonstrated that children change their attitude toward a toy that is associated with a potential mild punishment (Aronson & Carlsmith, 1963). Similarly, previous work showed that a number of bird species prefer items that are obtained with more effort (e.g., Clement et al., 2000; DiGian et al., 2004; Friedrich & Zenall, 2004; Friedrich et al., 2004). Unfortunately, the results of these latter studies can be interpreted without attributing dissonance reduction to the birds, as they may have preferred the option that required more work because of hedonic-contrast effects. The present study was better able to isolate the reasons for both childrens and animals' attitude change because the only feature that differed between the experimental and control conditions was whether or not subjects made an intentional choice. Our subjects' attitude changes had to be due to the fact that they made a cognitive-dissonance-inducing decision, one that was discordant with their previous assessment that the two options were of equal value. The present study thus provides what we feel is a simpler and more direct demonstration of dissonance reduction per se than work performed previously. Moreover, we used nearly identical methods to demonstrate similar attitude changes in children and primates.

Our findings for young children challenge the idea that peoples extensive experience with the negative consequences of their decisions teaches them to change their discordant attitudes. Because young children have relatively little experience with decision making, it is unlikely that the motivation to reduce cognitive dissonance can be attributed solely to past cognitive history. We recognize, of course, that 4-year-olds have some prior experience with the consequences of dissonant cognitions (though surely less than adults). For this reason, future studies with infants, who have virtually no experience with such cognitions, can clarify the extent to which experience plays a role in the development of dissonance-reduction mechanisms.

The fact that both children and nonhuman primates derogate unchosen alternatives raises the possibility that the drive to reduce dissonance is an aspect of human psychology that emerges without the need for much experience. Indeed, behavioral similarities between young human subjects and closely related primates are a signature of cognitive systems that are typically thought to be constrained across development, maybe even emerging innately. Such *core-knowledge* mechanisms have been proposed in other areas of cognition, such as the domains of numerical understanding (Feigenson et al., 2004; Wynn, 1992) and object cognition (Spelke, 2000), but have, to our knowledge, never before been proposed in the domain of attitude formation and change. The present results raise an interesting possibility: There may be some core aspects of cognition that give rise to cognitive dissonance as well. Our findings hint that some of the mechanisms that drive cognitive-dissonance-reduction processes in

ARTICLE 41

What factors may have an impact on determining the defendant's guilt or innocence? Jurors are asked to weigh the evidence presented during the trial. Hopefully, they will not permit irrelevant characteristics of the defendant—such as his or her physical appearance, race, or sex—to affect their judgment. But is it really possible to be totally objective in such situations? Or do irrelevant factors play a role in our beliefs about guilt or innocence?

The following article by Harold Sigall and Nancy Ostrove is a classic piece of research that investigated the impact of the defendant's physical attractiveness on the severity of sentences given to her. Earlier studies had indicated that physically attractive individuals often have great advantages over less attractive people in a variety of situations. This study not only examined the role of physical attractiveness in a trial-like setting but also how the nature of the crime and attractiveness interact to influence judgments about the defendant. The article also tests two different models that may explain why this particular effect occurs.

Beautiful but Dangerous Effects of Offender Attractiveness and Nature of the Crime on Juridic Judgment

■ Harold Sigall and Nancy Ostrove

The physical attractiveness of a criminal defendant (attractive, unattractive, no information) and the nature of the crime (attractiveness-related, attractiveness-unrelated) were varied in a factorial design. After reading one of the case accounts, subjects sentenced the defendant to a term of imprisonment. An interaction was predicted: When the crime was unrelated to attractiveness (burglary), subjects would assign more lenient sentences to the attractive defendant than to the unattractive defendant; when the offense was attractiveness-related (swindle), the attractive defendant would receive harsher treatment. The results confirmed the predictions, thereby supporting a cognitive explanation for the relationship between the physical attractiveness of defendants and the nature of the judgments made against them.

Research investigating the interpersonal consequences of physical attractiveness has demonstrated clearly that good-looking people have tremendous advantages over their unattractive counterparts in many ways. For example, a recent study by Miller (1970) provided evidence for the existence of a physical attractiveness stereotype with a rather favorable content. Dion, Berscheid, and Walter (1972) reported similar findings: Compared to unattractive people, better-looking people were viewed as more likely to possess a variety of socially desirable attributes. In addition, Dion et al. subjects predicted rosier futures for the beautiful stimulus persons—attractive people were expected to have happier and more successful lives in store for them. Thus, at least in the eyes of others, good looks imply greater potential.

Copyright © 1975 by the American Psychological Association. Reproduced with permission. Sigall, H., & Ostrove, N. (1975). Beautiful but dangerous: Effects of offender attractiveness and nature of the crime on juridic judgment. *Journal of Personality and Social Psychology*, 31(3), 410-414.

Since physical attractiveness hardly seems to provide a basis for an equitable distribution of rewards, one might hope that the powerful effects of this variable would occur primarily when it is the only source of information available. Unfair or irrational consequences of differences in beauty observed in some situations would cause less uneasiness if, in other situations given other important data, respondents would tend to discount such "superficial" information. Unfortunately, for the vast majority of us who have not been blessed with a stunning appearance, the evidence does not permit such consolation. Consider, for example, a recent study by Dion (1972) in which adult subjects were presented with accounts of transgressions supposedly committed by children of varying physical attractiveness. When the transgression was severe the act was viewed less negatively when committed by a good-looking child, than when the offender was unattractive. Moreover, when the child was some enduring dispositional quality: Subjects believed that unattractive the offense was more likely to be seen as reflecting unattractive children were more likely to be involved in future transgressions. Dion's findings, which indicate that unattractive individuals are penalized when there is no apparent logical relationship between the transgression and the way they look, underscore the importance of appearance because one could reasonably suppose that information describing a severe transgression would "overwhelm the field," and that the physical attractiveness variable would not have any effect.

transgressions in the future. Since attractive offenders are viewed as less prone to recidivism and as having greater potential worth, it was expected that under such circumstances an attractive defendant would receive less punishment than an unattractive defendant involved in an identical offense. When, however, the crime committed may be viewed as attractiveness-related, as in a confidence game, despite being seen as possessing more potential, the attractive defendant may be regarded as relatively more dangerous, and the effects of beauty could be expected to be cancelled out or reversed. The major hypothesis, then, called for an interaction: An attractive defendant would receive more lenient treatment than an unattractive defendant when the offense was unrelated to attractiveness; when the crime was related to attractiveness, the attractive defendant would receive relatively harsh treatment.

METHOD

Subjects and Overview

Subjects were 60 male and 60 female undergraduates. After being presented with an account of a criminal case, each subject sentenced the defendant to a term of imprisonment. One-third of the subjects were led to believe that the defendant was physically attractive, another third that she was unattractive, and the remainder received no information concerning appearance. Cross-cutting the attractiveness variable, half of the subjects were presented with a written account of an attractiveness-unrelated crime, a burglary, and the rest with an attractiveness-related crime, a swindle. Subjects were randomly assigned to condition, with the restriction that an equal number of males and females appeared in each of the six cells formed by the manipulated variables.

Procedure

Upon arrival, each subject was shown to an individual room and given a booklet which contained the stimulus materials. The top sheet informed subjects that they would read a criminal case account, that they would receive biographical information about the defendant, and that after considering the materials they would be asked to answer some questions. Clipped to this page was a 5 x 8 inch card which contained routine demographic information and was identical in all conditions. In the attractive conditions, a photograph of a rather attractive woman was affixed to the upper right-hand corner of the card; while in the unattractive conditions, a relatively unattractive photograph was affixed. No photograph was presented in the control conditions. Subjects then read either the account of a burglary or a swindle. The burglary account described how the defendant

Can beautiful people get away with murder? Although Dion (1972) found no differences in the punishment recommended for offenders as a function of attractiveness, Monahan (1941) has suggested that beautiful women are convicted less often of crimes they are accused of, and Efran (1974) has recently demonstrated that subjects are much more generous when assigning punishment to good-looking as opposed to unattractive transgressors.

The previous findings which indicate a tendency toward leniency for an attractive offender can be accounted for in a number of ways. For example, one might explain such results with the help of a reinforcement-affect model of attraction (e.g., Byrne & Clore, 1970). Essentially, the argument here would be that beauty, having positive reinforcement value, would lead to relatively more positive affective responses toward a person who has it. Thus we like an attractive person more, and since other investigators have shown that liking for a defendant increases leniency (e.g., Landy & Aronson, 1969), we would expect good-looking (better liked) defendants to be punished less than unattractive defendants. Implicit in this reasoning is that the nature of the affective response, which influences whether kind or harsh treatment is recommended, is determined by the stimulus features associated with the target person. Therefore, when other things are equal, benefit accrues to the physically attractive. A more cognitive approach might attempt to explain the relationship between physical appearance and reactions to transgressions by assuming that the subject has a "rational" basis for his responses. It is reasonable to deal harshly with a criminal if we think he is likely to commit further violations, and as Dion's (1972) study suggests, unattractive individuals are viewed as more likely to transgress again. In addition, inasmuch as attractive individuals are viewed as possessing desirable qualities and as having relatively great potential, it makes sense to treat them leniently. Presumably they can be successful in socially acceptable ways, and rehabilitation may result in relatively high payoffs for society. There is at least one implication that follows from the cognitive orientation which would not flow readily from the reinforcement model. Suppose that situations do exist in which, because of his high attractiveness, a defendant is viewed as more likely to transgress in the future. The cognitive approach suggests that in such instances greater punishment would be assigned to the attractive offender. We might add that in addition to being more dangerous, when the crime is attractiveness related, a beautiful criminal may be viewed as taking advantage of a God-given gift. Such misappropriation of a blessing may incur animosity, which might contribute to severe judgments in attractiveness-related situations. In the present investigation, the attractiveness of a defendant was varied along with the nature of the crime committed. It was reasoned that most offenses do not encourage the notion that a criminal's attractiveness increases the likelihood of similar

Barbara Helm, had moved into a high-rise building, obtained a pass key under false pretenses, and then illegally entered the apartment of one of her neighbors. After stealing \$2,200 in cash and merchandise she left town. She was apprehended when she attempted to sell some of the stolen property and subsequently was charged with breaking and entering and grand larceny. The swindle account described how Barbara Helm had ingratiated herself to a middle-aged bachelor and induced him to invest \$2,200 in a nonexistent corporation. She was charged with obtaining money under false pretenses and grand larceny. In both cases, the setting for the offense and the victim were described identically. The information presented left little doubt concerning the defendants' guilt.

The main dependent measure was collected on the last page of the booklet. Subjects were asked to complete the following statement by circling a number between 1 and 5: "I sentence the defendant, Barbara Helm, to _____ years of imprisonment." Subjects were asked to sentence the defendant, rather than to judge guilt versus innocence in order to provide a more sensitive dependent measure.

After sentencing had been completed, the experimenter provided a second form, which asked subjects to recall who the defendant was and to rate the seriousness of the crime. In addition, the defendant was rated on a series of 9-point bipolar adjective scales, including physically unattractive (1) to physically attractive (9), which constituted the check on the attractiveness manipulation. A post-experimental interview followed, during which subjects were debriefed.

RESULTS AND DISCUSSION

The physical attractiveness manipulation was successful: The attractive defendant received a mean rating of 7.53, while the mean for the unattractive defendant was 3.20, $F(1, 108) = 184.29, p < .001$. These ratings were not affected by the nature of the crime, nor was there an interaction.

The criminal cases were designed so as to meet two requirements. First, the swindle was assumed to be attractiveness-unrelated, while the burglary was intended to be attractiveness-related. No direct check on this assumption was made. However, indirect evidence is available: Since all subjects filled out the same forms, we obtained physical attractiveness ratings from control condition subjects who were not presented with a photograph. These subjects attributed greater beauty to the defendant in the swindle condition ($X = 6.65$) than in the burglary condition ($X = 5.65$), $F(1, 108) = 4.93, p < .05$. This finding offers some support for our contention that the swindle was viewed as attractiveness-related. Second, it was important that the two crimes be viewed as roughly comparable in seriousness. This was necessary to preclude alternative explanations in terms of differential seriousness. Subjects rated the seriousness of the crime on a 9-point scale extending from not at all serious (1) to extremely serious (9). The resulting responses indicated that the second requirement was

met: In the swindle condition the mean seriousness rating was 5.02; in the burglary condition it was 5.07 ($F < 1$). Table 1 presents the mean punishment assigned to the defendant, by condition. Since a preliminary analysis demonstrated there were no differences in responses between males and females, subject sex was ignored as a variable. It can be seen that our hypothesis was supported: When the offense was attractiveness-unrelated (burglary), the unattractive defendant was more severely punished than the attractive defendant; however, when the offense was attractiveness-related (swindle), the attractive defendant was treated more harshly. The overall Attractiveness \times Offense interaction was statistically significant, $F(2, 108) = 4.55, p < .025$, and this interaction was significant, as well, when the control condition was excluded, $F(1, 108) = 7.02, p < .01$. Simple comparisons revealed that the unattractive burglar received significantly more punishment than the attractive burglar, $F(1, 108) = 6.60, p > .025$, while the difference in sentences assigned to the attractive and unattractive swindler was not statistically significant, $F(1, 108) = 1.39$. The attractiveness-swindle condition was compared with the unattractive-swindle and control-swindle conditions also, $F(1, 108) = 2.00, ns$. Thus, strictly speaking, we cannot say that for the swindle attractiveness was a great liability; there was a tendency in this direction but the conservative conclusion is that when the crime is attractiveness-related, the advantages otherwise held by good-looking defendants are lost.

Another feature of the data worth considering is that the sentences administered in the control condition are almost identical to those assigned in the unattractive condition. It appears that being unattractive did not produce discriminatory responses, per se. Rather, it seems that appearance had its effect through the attractive conditions: The beautiful burglar got off lightly, while the beautiful swindler paid somewhat, though not significantly, more. It can be recalled that in the unattractive conditions the stimulus person was seen as relatively unattractive and not merely average looking. Therefore, the absence of unattractive-control condition differences does not seem to be the result of a weak manipulation in the unattractive conditions.

Perhaps it is possible to derive a small bit of consolation from this outcome, if we speculate that only the very attractive receive special (favorable or unfavorable) treatment, and that others are treated similarly. That is a less frightening conclusion than one which would indicate that unattractiveness brings about active discrimination.

TABLE 1 / Mean Sentence Assigned, in Years ($n = 20$ per cell)

Defendant Condition		Offense	
Attractive	Unattractive	Attractive	Unattractive
4.35	5.20	5.45	4.35
4.35	5.10	2.80	4.35

Especially now when the prospect of reducing the size of juries is being entertained, it would be important to find out whether extralegal considerations are more likely to have greater influence as the number of jurors decreases.

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ENDNOTE

1. This information, as well as copies of the case accounts referred to below, can be obtained from the first author.

This study was supported by a grant from the University of Maryland General Research Board.

As indicated earlier, previous findings (Efran, 1974) that attractive offenders are treated leniently can be interpreted in a number of ways. The results of the present experiment support the cognitive explanation we offered. The notion that good-looking people usually tend to be treated generously because they are seen as less dangerous and more virtuous remains tenable. The argument that physical attractiveness is a positive trait and therefore has a unidirectionally favorable effect on judgments of those who have it, would have led to accurate predictions in the burglary conditions. However, this position could not account for the observed interaction. The cognitive view makes precisely that prediction.

Finally, we feel compelled to note that our laboratory situation is quite different from actual courtroom situations. Most important, perhaps, our subjects made decisions which had no consequences for the defendant, and they made those decisions by themselves, rather than arriving at judgments after discussions with others exposed to the same information. Since the courtroom is not an appropriate laboratory, it is unlikely that actual experimental tests in the real situation would ever be conducted. However, simulations constitute legitimate avenues for investigating person perception and interpersonal judgment, and there is no obvious reason to believe that these processes would not have the effects in trial proceedings that they do elsewhere.

Whether a discussion with other jurors would affect judgment is an empirical, and researchable, question. Perhaps if even 1 of 12 jurors notes that some irrelevant factor may be affecting the jury's judgment, the others would see the light.

CRITICAL THINKING QUESTIONS

1. This article used pictures only of females to show defendants of varying attractiveness. Would the same results be obtained if male defendants were used? In other words, do you think that attractiveness stereotypes operate in the same way for males as for females? Defend your answer.
2. As the authors of the article noted, the methodology of the study differed from real-life jury trials in several ways. For example, subjects made their decisions alone and were presented with a paper description of the person and deed, not a real-life person and crime. Design a study that would investigate the same variables studied in the article in a more natural environment.
3. Would the results of this study be generalizable to situations other than jury trials? Think of a situation in which the attractiveness of a person making a request or performing a certain action may result in his or her being treated differentially as a result of his or her attractiveness. Explain your answer.
4. What implications do these findings have for the U.S. legal system? How could the effects of irrelevant factors such as attractiveness somehow be minimized in the real-world courtroom? For example, would telling the jurors beforehand about the tendency to let attractiveness influence their judgments make any difference? Why or why not?

ADDITIONAL RELATED READINGS

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