

**Modeling, vicarious reinforcement and extraversion  
on blood donating in adults:  
Immediate and long-term effects\***

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*Abstract*

*Studied the immediate and long-term effects of modeling on adult altruism using a quasi field experiment in a naturalistic setting. Forty-three female trainee occupational therapists aged 18-21 observed or did not observe a female model volunteer to donate blood. Modeling significantly increased the number of female observers who (a) also agreed to donate and (b) in turn actually gave their blood. The opportunity to donate blood occurred in a naturalistic situation on average six weeks after the commitment. It was concluded that observing a model could produce generalizable and durable behavior change in adults using an altruistic behavior of some cost to the individual. Personality and vicarious reinforcement effects however were not found.*

One of the most potent socializing processes so far discovered appears to be learning through the observation of what other's do. Rushton (1976) has

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reviewed many well-controlled laboratory studies in which it has been amply demonstrated that allowing children to see an altruistically behaving model affects not only the amount and direction of those children's subsequent altruistic behavior but also its durability and generalizability. Thus, for example, both Rushton (1975) and Rice and Grusec (1975) showed that altruistic modeling produced very strong durability in children's generous behavior, over a two-month period in the former study and over a *four*-month period in the latter. Rushton (1975) also showed that the modeled behavior, whether generous or selfish, generalized across such changes in the two-month retest situation as a different experimenter in a different locale.

Despite the impressive number of studies that demonstrate the effectiveness of behavior change induced as a consequence of model observation, there still remains uncertainty about the processes involved. Many competing theoretical accounts of the modeling process have been proposed (cf. Bandura, 1969; Gewirtz, 1969; Kohlberg, 1969) and these will hopefully generate productive research in this field in the future. Of more immediate concern however is the *atheoretical* criticism of most of the *sources of data* which psychologists might use to test between these alternative models. Critics of laboratory modeling experiments suggest that 'experimenter-bias' and 'demand characteristics' may account for the findings equally as well as formal theories of modeling. The usual demand characteristics explanation is frequently at the conceptual level and is of the form: 'Children are removed from their classroom, taken to a strange place and introduced to an experimenter interested in testing them. Obviously, the children "strive after meaning" and attempt to work out what is expected of them. When they see a model donate to a charity, they reason that this is what the experimenter wants them to do. Subsequently, children are motivated to please the experimenter and therefore also donate to the charity'.

One solution to this perplexing problem is to show that the processes that are discovered in the laboratory with children are also generalizable to the real world with adults. Relatively few studies however have looked at the effects of altruistic example on adults in naturalistic situations. Those that have, find similar results to the experiments carried out with children (Bryan and Test, 1967; Hornstein, Fisch and Holmes, 1968; Wagner and Wheeler, 1969). The present study was designed to extend these findings and see whether observing a model can produce *durable* and generalizable behavior change in adult observers. To investigate this question, two dependent variables were used, separated both in time and across situational demands. The first consisted of the subject signing or not signing a form volunteering to donate some quantity of blood at a point in the future. The second was whether the subject did or did not eventually donate a pint of blood when the

opportunity was subsequently provided, some weeks later, by the local Blood Transfusion Service.

A still further issue to be investigated is the part played in learning by individual differences in temperament. A general person variable which might be of interest to social learning theorists is that of 'introversion-extraversion'. Recent theoretical re-formulations of this trait anchor it to possibly genetically based anatomical and physiological substrates that are thought to mediate reinforcement (see Gray, 1970, 1973; Nicholson and Gray, 1972). Essentially it is suggested that introverts (especially neurotic introverts) are particularly susceptible to punishment effects whereas extraverts (and especially neurotic extraverts) are particularly susceptible to reward. In order to test these hypotheses in a social learning context, it was decided to manipulate vicarious reinforcement effects (Bandura, 1971) to the model. According to Bandura's (1971) social learning theory, an individual does not necessarily have to undergo *direct* experience with reinforcing or punishing consequences in order for his behavior to be modified. Simply observing the reinforcement contingencies occurring to *others* can result in behavior change. Thus, if the hypothesized individual differences in temperament exist they would be expected to interact with and affect the reception of these social learning variables. Specifically neurotic introverts would be most susceptible to changing their behavior after watching punishing consequences accrue to a model whereas neurotic extraverts would most likely evidence behavior change following observation of rewarding consequences occurring to a model.

In summary, our hypotheses were (1) Adults viewing an altruistic model who volunteers to donate blood will both volunteer and subsequently donate more blood than adults who do not view such modeled altruism. (2) The amount of blood both volunteered and subsequently donated should be the following function of observed vicarious reinforcement contingencies: positive > none > punishment  $\leq$  no-model control. (3) Since susceptibility to vicarious reward should grow with increasing extraversion and susceptibility to vicarious punishment should decrease with increasing extraversion, extraverts should both volunteer, and subsequently donate, more blood in the vicarious reward and vicarious punishment conditions than introverts, while no such differences should occur in the other two conditions.

## **Method**

### *Participants*

Forty-three female trainee occupational therapists aged 18-21 were recruited to

come into the Psychology Department at appointed times to take part in an experiment on 'social interaction'.

### *Personality tests*

Two weeks before the social interaction study was scheduled, participants were administered, in a group testing situation, the Eysenck Personality Inventory (Eysenck and Eysenck, 1971) and the Cattell 16 Personality Factor Questionnaire (Cattell, Eber and Tatsuoka, 1970) both of which yield measures of extraversion and neuroticism (anxiety). In addition to these self-report measures of personality a teacher who knew all the girls well, independently completed a Teacher's Rating Scale (Nicholson and Gray, 1972) which allowed a composite score to be computed for each girl both for extraversion and neuroticism.

### *Design*

A one-way analysis of variance was employed with four levels, these being altruistic model plus positive vicarious reinforcement; altruistic model plus no reinforcement; altruistic model plus vicarious punishment; and a no-model control condition.

### *Procedure*

*Participants introduction to model.* Participants came to the social psychology laboratories at their appointed time. They were met by a female experimenter and taken to a comfortable room with chairs and couches and introduced to a same sex model, a somewhat older and slightly sophisticated female confederate who was introduced as a 'Visiting Lecturer to Oxford' and who was 'helping in this study just like you are'. The experimenter then told both the model and the subject that they were taking part in a study on social interaction and that they were to sit facing each other in chairs provided and converse for about 10 minutes on their plans for the forthcoming summer vacation. This social interaction was then video-recorded without the subjects' awareness and served as the basis for a separate study. During the interaction the model acted in a friendly and interested manner towards the subject. After 10 minutes, the experimenter re-entered the room, informed them that their part in the study was now concluded and then debriefed both the subject and the model regarding the fact that they had been recorded. Following debriefing the subjects' permission was sought to use the videotapes. Finally the experimenter thanked both the subject and the model,

handed them a petty cash slip explaining to them both that the Department would pay them a fee to cover their expenses, and directed them to an office where they would receive payment.

*Experimental manipulations and initial testing.* On the floor above the laboratories and near the general offices, elevators, and mail boxes (i.e., in a setting quite dissimilar to the social laboratories), there was a table surrounded by 'Give Blood' posters. A second female accomplice wearing a large 'Give Blood' badge sat at the table. On the table were information pamphlets and donation forms. The arrangement was made to look as indistinguishable as possible from a real blood collecting service. Indeed all the forms and brochures were genuine and a number of regular members of the department expressed interest in donating their own blood. The table was located in such a position that the model and subject had to walk past it in order to reach the office where they were to receive payment for their part in the social interaction study. The Blood Collector approached both model and subject, introduced herself as representing the Regional Blood Transfusion Service and gave them a brief talk on the importance of giving blood.

*Modeling conditions.* At this point the Blood Collector addressed herself directly to the model and asked her if she would be willing to volunteer to donate a pint of blood and sign a donation form to that effect. When the model agreed to sign the form, the Collector asked her approximately how much she would be willing to donate over the next several months up to a maximum of six pints. It was stressed that the number she suggested at that point was not a commitment but rather for the Blood Transfusion Centre's information. The model replied that she would give the maximum of six pints. The collector thanked the model and excused herself to go to the nearby table to collect the appropriate forms. At this juncture the vicarious reinforcement manipulations were put into operation.

*Positive vicarious reinforcement.* An accomplice, a male in his late twenties, approached the model and, addressing her by name, asked her what was going on. When informed, the accomplice heaped praise upon the model for her public spirit and the model herself said that she felt pleased that she had volunteered.

*Neutral vicarious reinforcement.* The accomplice approached the model, addressing her by name, greeted her and asked her how she was in a pleasant manner. No reference was made to the blood donating.

*Vicarious punishment.* The accomplice approached the model as before. When told what was going on the accomplice disapproved strongly of the model's behavior suggesting that she would regret it and the model herself said that she was sorry that she had volunteered.

After manipulation of these independent variables the Blood Collector approached again and gave the model a form to fill out. This the model did at the

nearby table. The subject was then asked independently if she were also willing to volunteer to donate her blood and, if so, how many pints she might be willing to give, from one up to six.

*No-model control.* In this condition as soon as the Blood Collector had given her talk on the importance of giving blood, she addressed herself directly to the subject and asked her if she would be willing to volunteer to donate, and, if so, how much, e.g. from one to six pints. In this condition the model removed herself from the situation and engaged in conversation with an accomplice until the subject had either said yes or no and, if yes, had filled in the form.

In all the above conditions, the number of pints the subject volunteered to donate constituted the first dependent variable. If she refused to give, for whatever reason, and did not fill out the donating card, she was given a score of zero.

*Follow-up study.* The completed donation forms were forwarded to the Regional Transfusion Centre who then subsequently mailed appointment cards to each of the potential donors. For those who failed to attend on the first occasion, 4 additional separate appointments were mailed over the next 3 months, spaced on average 3 weeks apart.

## Results

Eight subjects were dropped from the analyses due to their overeagerness to make a response to the testing situation, i.e., prior to the experimental manipulations, the subject had either spontaneously volunteered to donate her blood (60 %) or had proffered an excuse as to why she could not do so (40 %).

Within the personality tests, consistency was found for the measures of extraversion. Eysenck's scale correlated  $r = .71$  ( $p < .001$ ) with Cattell and  $r = .62$  ( $p < .001$ ) with the Teacher's Rating Scale which in turn correlated  $r = .66$  ( $p < .001$ ) with Cattell. Less consistency was found for neuroticism (anxiety). Eysenck's measure correlated  $r = .59$  ( $p < .001$ ) with Cattell and  $r = .10$  with the Teacher's Rating Scale which correlated  $r = .01$  with Cattell.

The first dependent variable consisted of the number of pints of blood the subject agreed to donate. Table 1 presents the results as a function of experimental condition.

Using the unweighted means solution for unequal  $N$ s, the comparison between the three experimental conditions and the no-model control condition failed to reach significance ( $F [1,31] = 2.08$ ). No other comparisons approached significance, nor was there an overall main effect (all  $F$ s  $< 1.00$ ).

Due to the extremely restricted distribution of scores (subjects who agreed to

donate volunteered *either 1 or 6 pints*), the results were also analyzed for the *number* of subjects within conditions who agreed to donate (see Table 1). In order to assess the impact of behavioral example, subjects were collapsed over

Table 1. *Mean number of pints of blood volunteered and number of subjects volunteering and donating by modeling condition*

Testing	Vicarious reward	Modeling condition		
		Model present	No model	
		No consequences	Vicarious punishment	No consequences
<b>Volunteering</b>				
Mean	2.8	2.6	2.1	0.9
SD	(3.1)	(2.8)	(2.7)	(2.1)
N	9	11	7	8
Number volunteering	5	8	5	2
<b>Donating</b>				
Donors	2	4	3	0
Nondonors	7	7	4	8

vicarious reinforcement conditions; the proportion of subjects exposed to the altruistic model who volunteered to donate was compared with the proportion in the no-model condition. In the model condition, 18 of the 27 subjects agreed to donate at least one pint of blood, while only 2 of the 8 subjects in the no-model condition volunteered to give blood (Fisher Exact  $p < .05$ ).

The second dependent variable consisted of whether the subject, having signed a pledge card, would actually donate blood when given an opportunity to do so. Table 1 also presents these results. In the model condition, 9 of the original 27 subjects actually donated, while 0 of the original 8 subjects in the no-model condition gave blood (Fisher Exact  $p < .07$ ).<sup>1</sup>

Correlations were calculated between the personality variables and the amount of blood volunteered both within and across conditions. These correlations were all nonsignificant.

1. This comparison makes the assumption that none of the subjects who refused the initial request to sign the donation form would have actually donated if they had

been asked. Otherwise of course the correct comparison would have been 9 of 18 versus 0 of 2

## Discussion

This study replicates the finding that exposure to altruistic models increases altruistic behavior in observing adults (Bryan and Test, 1967; Hornstein et al., 1968; Wagner and Wheeler, 1969). Furthermore it demonstrates that these effects can endure over time and across situations using a behavior of some cost to the individual. It is not in any way obvious how the results found here could be attributed to a 'demand characteristics' or an 'experimenter effects' explanation since the durability of the modeled behavior was not tested for six weeks on average. The second test was performed in an independent situation, far removed from either the initial situational demands or the experimenter's or model's expectancies.

One possible explanation of the modeling effect may lie in the prior positive interaction between the subject and the model. Furthermore, although not independently manipulated, the model was presented as of high status. Both the power and the positivity of models have been found to increase subsequent imitative behavior (Bandura, 1969). The intervention of the male confederate who in all model contingency conditions greeted the female accomplice warmly, may also have added to the social positivity of the model. Although explanations of how modeling effects exert themselves are still not completely understood, the use of models for inducing behavior change (and as explanations of behavior change) is now well documented.

In this particular situation two factors were at work: modeling of volunteering to donate, and then the act of behaving in accord with this commitment. Whether the modeling would have had any effect without the act of volunteering cannot be known from these results. It would be illuminating to repeat the experiment with a design that did not require subjects to commit themselves at any point but to simply observe altruistic or selfish models and then, *some time later*, to be given an opportunity to demonstrate any new learning. However it should be pointed out that volunteering, per se, was not effective in leading to behavioral altruism since only 9 of the 20 who committed themselves actually gave. Interestingly, in this respect, an experiment by Kazdin and Bryan (1971) on competence, volunteering and actual donating of blood, found similar results. Only 11 out of 24 of their subjects who *volunteered* to donate blood actually gave. Thus it seems that 'volunteering' is not the same as 'doing'.

The experimental manipulation of vicarious reinforcement failed to produce a significant effect. This failure may well have been due to either (a) the insensitivity of the dependent variable in which the subjects felt obliged to offer *either* 1 pint or 6 pints if they were donating, or (b) the failure of the independent variables to

have been manipulated strongly enough. Given the failure of the vicarious reinforcement effects, the correlations of blood donating with personality did not allow us to test Gray's (1970, 1973) theory that introverts are particularly susceptible to punishment.

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*Résumé*

La présente étude analyse les effets immédiats et à long terme de l'altruisme chez l'adulte, développé d'après un modèle exemplaire dans une expérience quasi expérimentale réalisée dans des conditions naturelles. 43 assistantes médicales en cours de formation, âgées de 18 à 21 ans, ont observé ou non une volontaire modèle acceptant d'être 'donneuse de sang'. Cette incitation a augmenté nettement le nombre des observatrices qui (a) ont accepté d'être également donneuses de sang, et (b) qui, chacune à leur tour, ont effectivement donné de leur sang. Cette occasion d'être donneur de sang a eu lieu dans des conditions de la vie réelle, en moyenne six semaines après l'accord donné par les sujets de participer à l'expérience. Il en a été conclu qu'en observant un modèle, on pouvait provoquer un changement de comportement généralisable et durable chez des adultes en faisant appel à un comportement altruiste nécessitant un certain dévouement de la part de l'individu. Néanmoins, on n'a constaté aucun signe de changement de la personnalité ou de traits psychologiques accentués indirectement.

*Zusammenfassung*

Die unmittelbaren und langfristigen Effekte einer Modellvorgabe wurden hinsichtlich altruistischen Verhaltens Erwachsener mittels einer quasi-experimentellen Versuchsanordnung in einer realen Umgebung untersucht. 34 in der Ausbildung stehende, weibliche Beschäftigungstherapeuten im Alter von 18-21 beobachteten eine bzw. beobachteten eine weibliche Modellperson, die als Freiwillige Blut spendete. Die Modellvorgabe erhöhte signifikant die Zahl der weiblichen Beobachter, die (a) zusagten, Blut zu spenden und (b) dies schließlich wirklich taten. Die Gelegenheit in einer realen Situation Blut zu spenden, bot sich im Durchschnitt sechs Wochen nach der erfolgten Einwilligung. Die Ergebnisse erlauben die Schlußfolgerung, daß das Beobachten eines Modells eine generalisierbare und stabile Verhaltensänderung bewirken kann, auch wenn sich die Beobachtung auf altruistisches Verhalten mit gewissen Kosten für ein Individuum bezieht. Persönlichkeitseffekte und Auswirkungen stellvertretender Bekräftigung ließen sich nicht beobachten.