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A family study of altruism and its correlates

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University of Hawaii, 1990

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A FAMILY STUDY OF ALTRUISM
AND ITS CORRELATES

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF
THE UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN PSYCHOLOGY

AUGUST 1990

BY

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DEDICATION

This work is dedicated to Jackie and Jonathan Darvill, who have taught me more about the meaning of altruism over the past five years than all of the works cited and data presented within.

ACKNOWLEDGEMENTS

I would first and foremost like to thank my chairman Dr. Ron Johnson for his patient guidance, and for providing me with a model of a psychologist who is dedicated to an honest search for the truth through unbiased scientific inquiry. If I can live up to that model in my own professional career I know it will stand me in very good stead. A special thank you is also due my friend and colleague George Danko. George's guidance was less consistently patient than Ron's, but he is solely responsible for teaching me everything I know about computer analysis, and a good deal of what I know about interpretation of statistical analyses. To my other special friend and colleague, Keli Honbo, thank you for pointing out that the glass was half full while I busied myself seeking out the scoundrel who drank half my water. To my wife Jackie, and my son Jonathan, to whom this work is dedicated, I owe the greatest debt of gratitude. Few families would have had the love and courage to see me through these difficult times. To my parents, Jack and Marian Darvill, a simple thank you seems inadequate. How does one thank two people who waited 35 years for their son to decide what he was going to do with all that education they paid for? I would be a far better person if our altruism concordances were higher. Finally, I would like

to extend a special thank you to Dr. J. Phillippe Rushton. Although I have not had the honor to meet Dr. Rushton in person, he is responsible for blazing the trail I and others now follow. My reading of his research has given me the impression of a man of courage and integrity who is happiest when breaking new ground in psychology. May he continue to do so.

ABSTRACT

Data from 334 subjects were gathered using a self-report measure of altruism, along with measures of adjustment, dimensions of conscience, and religious orientation. Subjects included 102 families (adult offspring and parents). Correlations on altruism and related measures were taken between parents and offspring and between non-related members of the two cohorts. Comparison of intrafamily and interfamily correlation matrices supports the hypothesis that individual differences in offspring altruism can be predicted from parental altruism scores. Fathers' scores on altruism and related personality characteristics were most clearly predictive of offspring altruism scores, while mother-offspring correlations were limited to measures of past experience of receiving help and perceived cost of helping. Group differences in mean altruism scores were found with male subjects and older subjects obtaining higher mean scores on measures of giving and receiving help, and female and younger subjects obtaining higher mean scores on a measure of perceived cost of helping.

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I. INTRODUCTION

Over the past two decades social scientists have shown an increasing interest in the topic of human altruism. More recently this interest seems to have expanded to include those who make public policy in the United States as the nation finds itself in need of a higher level of altruism among its people. A country founded in no small part on the unquestioning faith of its citizens in rugged individualism and open competition, America appears increasingly imperiled by Americans' lack of a sense of mutual interdependence and social concern. Our business and industrial machine, forged in the furnace of nineteenth century Social Darwinism, is popularly believed to be lagging behind a Japanese industrial machine fueled by the power of individual self-sacrifice. A nation that has long advertised its quality of life to the world with phrases such as, "the American dream" finds itself awash in a sea of pollution, violent crime, drug addiction, and homeless citizens. Given this state of affairs, it is little wonder that the dominant themes of the last Presidential election tended to stress the need for individual citizens to make sacrifices for the benefit of their countrymen. Cleaning and maintaining the environment in North America, housing the homeless, improving education, making neighborhoods safe, and cutting the demand for illegal drugs in our

society are all issues that require an increase in the capacity of individual citizens to engage in altruistic sacrifice. This need for greater individual altruism is all the more pressing in light of dwindling government resources. When the President calls for a "kinder, gentler America", supported by "a thousand points of light", he is making an appeal for just such an increase in the national level of altruism. Nearly three decades ago, John Kennedy made a similar appeal for national altruism, exhorting Americans to sacrifice individual gain for the commonweal with the phrase, "ask not what your country can do for you, but what you can do for your country." During his short tenure as President, Kennedy issued another plea to the nation to reach the moon by the end of the decade, and this request generated a flurry of interdisciplinary scientific research activity aimed at solving the problems inherent in such an ambitious endeavor. Scientists from vastly disparate disciplines, who a few years earlier would likely have had little to do with one another, came together to solve a common problem. This unique cross-fertilization of ideas facilitated the sort of novel hypotheses and procedures necessary when one is breaking new ground. It is ironic that Presidential appeals to increase the national spirit of altruism have gone comparatively unheeded by the same scholarly community that put a human being on the surface of the moon. The appeal for a

kinder, gentler society must surely be at least as worthy a cause.

If we accept that such a kinder, gentler society must arise from the individual efforts of its citizens, an appropriate first step would seem to be to explore the various dimensions of the altruistic personality. Of particular interest are dimensions of the altruistic personality which might give us some clue as to its origin. A more complete understanding of the cultural and biological bases of the altruistic personality may enable policy makers and professionals in relevant fields such as education to promote altruistic behavior by encouraging the development and expression of personality factors which lead to such behavior.

The present study builds upon recent research on individual differences in altruistic behavior, and in particular upon the work on self-reported altruism begun by J. P. Rushton and his associates (e.g., Rushton, Chrisjohn, & Fekken, 1981; Rushton, Fulker, Neale, Eysenck, & Eysenck, 1986), and expanded upon by Johnson, Danko, Darvill, Bochner, Bowers, Huang, Park, Pecjak, Rahim, & Pennington (1989). A unique feature of the present study is that it looks at parent-offspring correlations on measures of altruism and related personality traits. The central goal of this research is to assess the extent to which individual differences in measurements of various

dimensions of the altruistic personality within a sample of young adults is predicted by the measurement of these personality dimensions in their parents. The central hypothesis underlying this study is that strong positive correlations will be found between parents and offspring. It is assumed that this correlation will be the result of parental influences on both the cultural and biological levels. At the cultural level, the parent's role as socialization agent is relevant. Psychologists have long considered the family to be the principal source for the socialization of important behavior patterns, including altruism. Freud (1935) proposed psychology's first well elaborated theory of the development of moral behavior within the family. While the Oedipal model is burdened with certain fatal flaws, Freud's notion that prosocial behavior owes much to the parent-child relationship has obvious merit and has continued to be the common wisdom within psychology.

The parental role in the transfer of genotypic characteristics needs neither defense nor explanation. Parents are the indisputable engine of genetic transmission. Whether or not parents make a contribution to offspring altruism through this medium is considerably more controversial. Recent theories emerging from the fields of sociobiology and behavior genetics suggest that biology may in fact be an important factor in observed individual

differences in human altruism. Research from these areas suggests that parents and families contribute to these individual differences not only by perpetuating genes that predispose their bearer toward altruistic behavior, but by the special challenges that a close association with genetic relative presents to the pursuit of individual genetic fitness.

Before elaborating on the details of the present family study of altruism, the relevant literature from both psychology and sociobiology is reviewed. Special emphasis is given to the altruistic personality type and to possible familial factors in its formation.

II. REVIEW OF THE LITERATURE

Defining Altruism

The ability of any science to contribute to progress in a given area is closely tied to how its practitioners define that area. Too narrow a definition may result in a very limited contribution. Early learning psychologists found that their very limited definition of that topic placed limitations on their ability to contribute to improvements in education and child rearing. On the other hand, the use of too broad a definition may result in no useful contribution at all, and lack of agreement on a definition may result in conflicting contributions, the sum of which may well be negative. Unfortunately, it is this condition which seems to prevail in the area of altruism research.

Biological Definitions

Altruism is popularly defined as a willingness to place the welfare of others before the welfare of oneself. While psychological definitions have generally been in agreement concerning this aspect of altruism, biologists are divided on this very central issue.

Biologists have traditionally been concerned with altruism in non-human species, and the contemporary biological definition of animal altruism requires the organism to behave in such a way as to promote the genetic fitness of

another at the expense of its own. Biological altruism involves risking or sacrificing such basic things as opportunity to breed, offspring, or even life itself. The existence of such behavior presents a significant challenge to a science which bases many of its theories on the premise that species evolved as they did because certain phenotypes maximize genetic fitness. Most of the attempts to assimilate altruism into a theory of genetic selection have involved demonstrating that, in many cases, altruists are either preserving their genetic fitness by helping individuals with whom they share genetic material (e.g., Hamilton, 1964; Dawkins, 1976), or that they are acting to preserve their species (Wynne-Edwards, 1962). A limitation of both of these approaches is that altruism is often directed toward individuals that are not genetically similar to the altruist. In fact, there are a number of instances in nature where the beneficiary of an altruistic act is not even a member of the same species as the altruist! An alternative biological explanation of altruism suggests that the sacrifices made by altruists are not sacrifices at all, but investments in a system of interdependency or reciprocity which maximizes the genetic fitness of each individual altruist (Trivers, 1974). If this view is valid, altruism may not involve putting the welfare of another before one's own at all; rather, it is yet another way in which individuals within a species

promote their own individual fitness. Such a notion, if true, could fit nicely with the individualistic philosophy that most Americans are so comfortable with. Perhaps God helps not only those who help themselves, but those who help others as well.

Psychological Definitions

Psychological definitions of altruism are not as demanding of the altruist as are biological ones. Risks to genetic security are not specifically required, and so psychologists haven't traditionally had to wrestle with the issue of why altruism has survived the rigors of natural selection. Despite this apparent advantage, psychologists enjoy no greater harmony concerning the issue of how altruism should be defined than do biologists. True, there has been general agreement that an altruistic act should have as its principal beneficiary someone other than the altruist, but there is less agreement as to whether or not all helpful acts qualify as acts of altruism. Some psychologists favor a simple "behavioral" definition of altruism which states that any act that benefits another qualifies as altruistic. As an example, consider the following definition by Midlarsky (1968):

...a subcategory of aiding, referring to helpful actions which incur some cost to the individual but bring either very little or nothing by way of gain, relative to the magnitude of the investment. (p. 229).

In a definition such as this no regard is given to the intent of the actor, it is only the outcome of the act that is important.

Many contemporary researchers do consider the actor's intent before assigning the label "altruism" to a given behavior. Among these adherents to a "motivational" definition of altruism, most insist that there be no a priori expectation of reward for the act. For example, Macauley and Berkowitz (1970) define altruism as "behavior carried out to benefit another without anticipation of rewards from external sources" (p. 3). Essentially identical criteria are included in the definitions of a number of other motivational theorists (e.g., Bar-Tal, 1976; Staub, 1978; Walster & Piliavin, 1972).

A Possible Common Ground

A number of researchers from both the behavioral and the motivational camps insist that for an act to be considered altruistic it must involve some sort of sacrifice on the part of the actor. The above definition from Midlarsky is an example of a behavioral version of this type of definition, and but motivational theorists, notably Bryan & London (1970), place a similar requirement for sacrifice on their definitions of altruism. This addition of a cost factor adds a new, and potentially measurable,

dimension to altruistic behavior in humans, as the degree of sacrifice involved in different acts may be placed on a continuum with relatively minor sacrifices (e.g., sacrifices of time or small amounts of money) at one end of the continuum and the sort of life- or fitness-threatening behaviors involved in the biological definition at the other. Alternatively, subjects could be asked to give their personal assessment of the cost involved in a particular act of altruism, regardless its nature, and the effect of perceived cost on helping could be studied. Viewing acts of altruism in cost-benefit terms is a longstanding practice among sociobiologists. By incorporating this aspect of the sociobiological definition into our own, psychologists will be in a position to test some of the predictions of sociobiological theory concerning human altruism. Specific acts of helping could be assessed in terms of whether the cost to the altruist is offset by the benefit to the recipient, and/or whether the cost to the altruist is offset by the potential for later reciprocity. Such reciprocity may come directly from the beneficiary or indirectly, perhaps from friends or relatives of the beneficiary, or from witnesses to the altruist's behavior.

Using a cost-benefit analysis of altruism provides psychology and sociobiology with the potential for a methodological common ground. It does not in itself

suggest that the mundane, routine sort of human altruism that psychologists study, and the genetic fitness altruism of the biological definition have a common biological base, but it does provide a means of addressing the issue. The view held by researchers in the field of sociobiology is that the two types of altruism are related, and that everyday helping behavior among humans has its basis in structures which evolved to serve the cause of biological fitness. This view is beginning to gain a foothold among psychologists, particularly among those who recognize the possibility that altruism may be a stable, measurable personality characteristic (e.g., MacDonald, 1984; Rushton, Chrisjohn, & Fekken, 1981; Rushton, Russell, and Wells, 1985). The psychological and sociobiological research reviewed below is investigated from the perspective that biology and evolution may in fact play some role in observed individual differences in altruistic behavior, although it is by no means implied that these factors explain as much of the variance in altruism as do socialization and enculturation. The definition of altruism guiding the present research views altruism as constituted of behaviors involving some degree of self-sacrifice where the primary immediate beneficiary is someone other than the altruist, although the possibility that reciprocity is involved in the motivation of altruism is not ruled out.

Psychology and the Altruistic Personality

The notion that there may be stable individual differences in altruism has only recently begun to gain respectability among psychologists. The first workable instrument for measuring the altruistic personality was introduced less than a decade ago by J. Philippe Rushton and his associates (Rushton, Chrisjohn, & Fekken, 1981). In introducing the Self-Report Altruism Scale Rushton summarizes the status of the altruistic personality in psychology in 1981:

If a survey were to be taken of researchers in the field of altruism as to whether they believed there was such an entity as "the altruistic personality," the majority would answer with a resounding "no." There are very few, if any, programs of research in operation on consistent patterns of individual differences in altruistic behavior, although just about every other conceivable research approach has been used. ... No, researchers do not study the altruistic personality for the fairly compelling reason that they don't believe there is such a thing. (p. 293).

In fact, Rushton's criticism is more appropriately directed toward social science researchers in the field of altruism. Researchers in the field of sociobiology have been studying the notion of an innate disposition toward altruistic behavior since the early 1970's. A review of this literature, along with psychological data supporting sociobiological theories of altruism is reviewed in a later section of this chapter. The reluctance of social scientists to apply their methodologies to the study of the altruistic

personality may be traced to an early "failed" attempt to detect reliable individual differences in prosocial behavior. In their landmark publication entitled, Character Education Inquiry, Volume II: Studies in the Nature of Character: Studies in Self Control, Hartshorne, May, & Maller (1929) administered 33 different behavioral tests of altruism, honesty, and self-control in classroom, play, home, church, and athletic contexts to 11,000 elementary and high school students. Scores on these measures were analyzed along with the results of extensive parent, peer, and teacher ratings of the helpfulness of individual children. The authors reasoned that by correlating scores on all of these measures, they could determine whether the childrens' behavior was specific to particular situations or under the influence of general personality traits. Correlations among the behavioral measures were low ($r=.23$ on average) leading the authors to conclude that consistent, measurable moral and prosocial personality traits such as altruism do not exist.

The interpretation these authors made of their data had implications for future work on altruism, and on personality traits in general. For example, Mischel (1968) observed that the typical coefficient of consistency of a behavior across situations is around $r=.30$ and suggested that such low predictive value renders the concept of personality traits effectively useless. Mischel's

assessment is exemplary of the "specificity" view of human social behavior.

Not all authors share this pessimism regarding the possibility of reliably measuring prosocial personality traits. Three exponents of the contrasting "generality" view of behavior; Burton (1963), Eysenck (1977), and Rushton (1980, 1981) have each suggested that the important data of Hartshorne et al. have been wrongly interpreted. Burton undertook a detailed reanalysis of the data on honesty from the Character Education Inquiry. He observed that, while the correlations between the various tests were indeed low, they were also uniformly positive. He also noted that the lowest correlations in the study all involved tests with either low or unknown reliability. In his reanalysis, Burton dropped these unreliable measures and subjected the remaining scores to a factor analysis. The results revealed a single strong component which consistently accounted for at least twice the variability of the second component. All correlations were positive in direction, and all but one exceeded $r=.50$, suggesting that the low scores in the original Hartshorne, et al. analysis were due to excessive error variance.

Setting aside the issue of methodology in the Hartshorne et al. study, Eysenck (1977), and Rushton (1980, 1981) suggest that the requirement that any two single measures of a proposed personality trait must show a strong

correlation for the existence of that trait to be supported is unduly stringent. Both of these critics of the specificity view point out that a degree of inconsistency in behavioral manifestations of a trait across situations is to be expected, as different situations place different demands on the individual. As Eysenck expresses it: "To imagine that the existence of a general trait of honesty precludes the existence of degrees of temptation, or of degrees of immorality between one act and another, is quite unrealistic; there is, of course, no such implication in the 'generality' theory." (Eysenck, 1977, p. 32). Under the generality theory envisioned by researchers such as Eysenck and Rushton low correlations between any two single measures of a trait are to be expected, as there is always a certain element of randomness in any given single measure. They suggest that a more accurate interpretation of the Character Education Inquiry data could be made if the various service measures were combined into a battery and correlated with the results of the peer and teacher evaluations of individual subjects. Rushton (1981) reports correlations of +.50 to +.60 when data are analyzed in this way, suggesting that it is possible to measure and predict altruistic behavior.

In addition to his reanalysis of the Character Education Inquiry data, Rushton, along with his colleagues, broke new ground in the establishment of consistent

patterns of individual differences in altruistic behavior across situations with the introduction of the twenty-item Self-Report Altruism Scale (SRA-Scale) Rushton, Chrisjohn, & Fekken (1981). Rushton and his associates gave the SRA-scale to 146 university undergraduates and correlated their scores on this measure with four behavioral and four paper and pencil measures of altruism. Behavioral measures included (1) volunteering to read to blind persons in response to a telephone solicitation; (2) responding to a plea for experimental subjects; (3) having taken a first aid course; and (4) having completed an organ donor card (attached to all Ontario drivers' licenses. Paper-and-pencil measures of altruism included (1) a questionnaire measuring sensitive attitudes compiled by the Educational Testing Service (ETS: Derman, French, & Harman, 1978); (2) the nurturance scale of the Personality Research Form (PRF: Jackson, 1974); (3) a measure of helping in emergency scenarios; and (4) the Jackson Vocational Interest Survey (JVIS: Jackson, 1977). Having high helping interests on this last measure was expected to predict high scores on the SRA-scale. After adjusting for measured social desirability responding, Rushton's measure of altruism correlated positively and significantly with one of the behavioral measures (having filled out an organ donor card), and three of the four paper-and-pencil measures (the ETS measure of sensitive attitude, the PRF nurturance

scale, and the responses to the emergency vignettes. Further, the SRA-scale predicted a linear combination of all eight measures at $r=+.40$ ($p<.01$). Rushton also looked at personality correlates of altruism and found that SRA-scores correlated positively with measures of social responsibility (Berkowitz & Daniels, 1964) and empathy (Mehrabian & Epstein, 1972) at the $p<.01$ level, and negatively with the Christie and Geis, (1968) measure of Machiavellianism ($p<.05$).

The line of inquiry pioneered by Rushton and his associates was extended and elaborated upon by Ronald Johnson and his colleagues at the Behavioral Biology Laboratory (BBL) of the University of Hawaii (Johnson, Danko, Darvill, Bochner, Bowers, Huang, Park, Pecjak, Rahim, & Pennington (1989). Johnson et al. collected data from 1052 university undergraduates in six different countries and two American states (Hawaii and Missouri) using a self report altruism measure inspired by the Rushton SRA-scale. The original 20 items from the SRA-scale were utilized along with 36 new items, added to make the scale more appropriate to a wider cultural and socio-economic range. In another departure from the Rushton et al. instrument, the Johnson scale involves three measures related to helping behavior. For each of the 56 items the subject is asked how often he or she has performed a given altruistic act, using a five point scale (never, once, more

than once, often, very often). For items where it is logically appropriate to do so, subjects are then asked to rate the frequency with which they have been similarly helped in the past, using the same five point scale. Finally, subjects are asked to rate the importance of each behavior as an act of altruism using a four point scale (unimportant, slightly important, moderately important, very important, very important). Psychometric properties of the scale were found to be quite good with a test-retest reliability of .94 for all three of the measures, and coefficient alpha (Cronbach, 1951) reliabilities ranging from .89 to .94 for the "gave help" measure, .86 to .90 for the "received help" measure, and .91 to .95 for the "importance of helping" measure.

In addition to testing the psychometric properties of the altruism scale, Johnson et al. investigated several theoretical correlates of self-reported altruism. Measures of included the revised Eysenck Personality Questionnaire (EPQ-R; Eysenck, Eysenck, & Barrett, 1985), Dimensions of Conscience Questionnaire (DCQ; Johnson & Noel, 1970), and the Intrinsic-Extrinsic Religious Orientation (IERO) scale (Feagin, 1964; Allport & Ross, 1967). Scores on the three measures of altruism correlated positively and significantly with scores on the guilt, extroversion and intrinsic religiosity measures. Further, stable group differences emerged across the three altruism measures and across five

categories of items based upon the nature of the sacrifice involved in the various acts of altruism. Missouri subjects scored above the median on all 15 measures, Egyptians on 12 of 15, Yugoslavians on 11 of 15. Korean and Taiwanese scored at or below the median on 13 of the 15 altruism measures. National income was not positively associated with altruism scores. Subjects from Egypt, a country poor in resources, yielded much higher mean altruism scores than those from relatively more prosperous Korea and Taiwan. The authors speculate that the stress placed on altruism toward strangers in the scale may have biased the measure against East Asian subjects, whose cultural traditions favor altruism toward kin. A follow up study is underway in which items are included which concern altruism toward friends and relatives, and preliminary analysis suggests that shifting the focus away from helping strangers does bring scores of East Asian subjects up.

In addition to group differences among the various cultures sampled, a stable gender difference emerged with males scoring higher on the scale than females. This gender difference cut across the various cultural groups. In their meta-analysis of the altruism literature, Eagly and Crowley (1986) show that males tend to score higher on measures involving helping strangers than do females, and it was initially felt that the emphasis on help given to strangers of the altruism scale may account for the gender

difference in the Johnson et al. study. However, preliminary analysis of the data from the follow up study on altruism toward friends and acquaintances has not supported this hypothesis. Further, the gender-bias favoring males is consistent across the five categories of sacrifice, although the difference is greatest for categories physical effort and risk of physical or psychological harm.

It is quite probable that these mean differences will ultimately be explained as an artifact of the type of items used in the scale. Whether the instrument is truly gender biased or not, however, it yields similar patterns of individual differences within each gender. The measure of giving help correlates, significantly and positively with guilt, extraversion, and intrinsic religiosity; and negatively with shame. Receiving help correlates significantly and positively with extraversion and negatively with shame for both sexes, and positively with intrinsic religiosity for males only. Rated importance of helping shows a positive significant correlation with guilt and intrinsic religiosity.

The strongest correlations obtained in the Johnson et al. study were between the three altruism measures. Correlations between giving and receiving help for both sexes are in the high seventies, while more modest but equally significant correlations ($p < .001$) are obtained between giving help and rated importance of helping, and

between receiving help and rated importance. The extremely high correlation between giving and receiving help is supportive of Robert Trivers' (1974) sociobiological theory of reciprocal altruism, which is reviewed in detail in a later section of this chapter.

The results of the Rushton et al. and the Johnson et al. studies, along with the reanalyses of the Character Education Inquiry data by Burton, Eysenck and Rushton suggest that it is indeed possible to accurately measure the altruistic personality. We now have good evidence from psychology that there are stable individual differences in altruistic behavior, and that altruism can be predicted from measures of other related personality factors. We also have good evidence that at least part of the variance in human altruism may be due to genetic variation. This evidence comes from four sources: (1) research on the affective basis of altruism; (2) developmental research which suggest that individual differences in altruistic tendencies are discernable at a very early age; (3) the results from an MZ/DZ twin study by J. P. Rushton; and (4) evidence from social science research which supports the various sociobiological models of human altruism. All of these areas will be reviewed in the sections which follow.

The Affective Basis of Altruism

The search for an intrinsic, affective motivator for human altruism has focused on empathy. Martin Hoffman (1981) defined empathy as a largely involuntary, vicarious reaction to emotional cues emitted by another person. Hoffman sees empathy as innate and having a neurological basis, but he believes that empathic arousal only becomes an important source of altruistic motivation as children develop cognitively. Specifically, once a child learns to recognize, (1) that the cause of their empathic distress resides in the distress or misfortune of another, and (2) that it can reduce or eliminate this aversive empathic arousal by acting to relieve the other person's distress, it will reliably respond to empathic arousal by alleviating the distress of the suffering victim.

A major proponent of the notion that empathy motivates altruism is Daniel Batson. Batson and his colleagues have added a valuable dimension to research on the empathy-altruism connection by conducting experimental research in this area. In one study, Batson, Bolen, Cross, & Neuringer-Benefiel (1986) placed 60 female undergraduate subjects in an empathy arousing situation and manipulated the ease with which subjects could escape the source of empathic arousal. The experimental situation involved a confederate named "Elaine" who was allegedly receiving electric shocks while participating in two-minute digit

recall trials. Subjects believed that they and Elaine had been randomly assigned to roles as workers or observers in the experiment, and they watched the tribulations of the "worker" over a closed-circuit television monitor which was actually connected to a videotape player. In the "easy-escape" condition, the subject was told after two trials that she had the option of helping Elaine out by taking her place as "worker" if she so desired, otherwise she was free to go. In the "difficult-escape" condition, the subject was again given the option of helping Elaine, but if she elected not to do so she needed to remain on as observer and witness Elaine's misery through eight more trials. Batson and his colleagues found that helping correlated positively with scores on a paper-and-pencil measure of empathy. Further, they found that subjects were more likely to help in the easy escape condition, where a non-altruistic means of alleviating empathic distress was available. Data from these and other experimental designs utilized by Batson and his colleagues (e.g., Batson, Dyck, Brandt, Batson, Powell, McMaster, and Griffitt, 1988; Toi and Batson, 1982) provide support for Hoffman's notion that empathy is an affective motivator of altruism. These studies also open the possibility of situational variables intruding on the affective basis of altruism. The notion that people will avoid altruism when the situation allows them to do so is consistent with Trivers' theory of

reciprocal altruism, which is reviewed in a later section of this chapter.

Developmental Trends in Altruism

Developmental research has revealed altruistic traits in very young children. Following up on Hoffman's notion that empathy is a basis for altruism, Hoffman and Sagi (1976) conducted an experiment on infant empathy by exposing 36-hour-old infants to, (1) another neonate's cry, (2) an equally loud computer simulation of a crying infant, or (3) silence. They found that infants were much more likely to cry in response to the real infant's cry than to the computer simulation or the control condition.

A major longitudinal study by Radke-Yarrow & Zahn-Waxler (1982) validates Hoffman's model of the development of an empathy-altruism connection, and provides some insight into the etiology of individual differences in empathy-based altruism. These researchers identified three profiles of responding to empathic distress in two-year-olds. Children in their sample either reacted by showing concern for the distressed individual, by turning away and shutting out the source of distress, or by lashing out violently at the source of the other's pain (e.g., tearing up the newspaper article that made Mommy cry). When these youngsters were retested at age seven, roughly two-thirds

of them displayed the same style of reaction to empathic distress as they did as two-year-olds.

On a strictly behavioral level, altruism can be detected in children much younger than two years of age. Specific altruistic behaviors can be seen as early as the first year of life. By 12 months of age, children can be seen "sharing" interesting experiences by pointing (Leung & Rheingold, 1981), and they will occasionally offer toys to their companions (Hay, 1979). By 18 months, some children may be found helping out with the household chores (Rheingold, 1982). By the end of the third year, a primitive form of reciprocity develops. Levitt, Weber, Clark, & McDonnell (1985), studied 29 to 26 month olds and found that toddlers who had previously received a toy from a peer were more likely to share a toy with a peer later on (with a little encouragement from Mom) than were children who had not experienced sharing from the peer.

Demonstrations of sympathy and compassion are also fairly common among very young children (Radke-Yarrow, M, Zahn-Waxler, C., & Chapman, M. (1983), and Zahn-Waxler, C., Radke-Yarrow, M., & King, R. (1979) have documented individual differences in these traits in 18-to 30 month-olds.

Altruism in Twin Sets

Perhaps the most convincing bit of evidence for a genetic component to human altruism comes once again from J. Philippe Rushton. Rushton and his colleagues (Rushton, Fulker, Neale, Blizard, & Eysenck, 1984; Rushton, Fulker, Neale, Eysenck, & Eysenck, 1986) conducted a study of MZ/DZ twin concordances using a sample of 573 adult twin pairs, a measure of nurturance, a measure of empathy, and the SRA-scale. Using Falconer's heritability estimate (Falconer, 1981), Rushton et al. found concordance rates for the monozygotic pairs of .53 for the SRA-scale, .54 for the empathy scale, and .49 for the nurturance scale. The Falconer's estimates for the dizygotic pairs were .25, .20, and .14 respectively, resulting in broad heritability estimates of 56% for altruism, 68% for nurturance, and 70% for empathy.

Altruism and Evolution

The impressive magnitude of Rushton's figures, coupled with the evidence from developmental research and the experimental manipulation of the empathy factor, makes it a questionable practice at best to ignore the possibility of a biological component to human altruism. At the same time these data are coming out of psychology, the new science of sociobiology is generating new theories as to the possible evolutionary bases of the human altruistic

personality. Two of these theories, Kin Selection and Reciprocal Altruism, are reviewed below. A third theory, concerning the evolutionary bases of parental encouragement of altruism, is reviewed in a later section on family influences on the altruistic personality.

Kin Selection

One of the most powerful of the contemporary sociobiological theories of altruism is the theory of kin selection. J.B.S. Haldane was the first to work out the essential features of kin selection (Haldane, 1955) but, as Trivers (1985) points out, Haldane shied from embracing his own formulation and left the work of introducing kin selection to the world to an obscure graduate student named William Hamilton. Hamilton (1964, 1972) expanded upon Haldane's theory and coined the term inclusive fitness to explain how behaviors which seem to benefit only others can actually result in a net genetic benefit to the altruist. The key term here is "genetic", for while Hamilton clearly believes that the unit of selection is the individual organism, he recognizes that the unit of retention is the gene. An individual's inclusive fitness is the frequency of its genes in the future generations of a breeding group. One's inclusive fitness can be enhanced by increasing the individual fitness of near relatives, as they share common genes. The actual probability that any given gene in ones

own genotype will have an exact duplicate in the genotype of a relative is referred to as the degree of relatedness (expressed as r) between the two. Degree of relatedness can be estimated mathematically, so altruism can be expressed in cost-benefit terms: the enhancement of an organism's inclusive fitness must outweigh the cost to its individual fitness. In a diploid species, such as our own, where each individual gets approximately half its genes from each parent, it is a fairly simple matter to determine degree of relatedness among family members. Parents and offspring share roughly half their genes in common, as do siblings. Aunts, uncles, and half-siblings share one quarter of their genes in common, and cousins are about one eighth related. Hamilton's model, then, would predict that the cost-benefit ratio of altruism should increase inversely to the degree of relatedness of the beneficiary. In order for an act of altruism toward an offspring or a sibling to be genetically cost-efficient, the benefit of helping (in enhanced inclusive fitness) must be better than twice the cost of helping (in reduced individual fitness). For half-sibs, aunts, and uncles, the ratio must be better than four to one, for cousins eight to one, and so on. To view the situation another way, all other factors held equal, a diploid organism (such as homo sapiens) should be about twice as likely to risk its individual fitness for its children, or its siblings

as for its half-sibs, and twice as likely to display altruism toward a half-sib as toward a first cousin. Given relationships such as these, the sociobiologist can observe patterns of altruism in nature and calculate the degree to which they approximate Hamilton's cost-benefit model.

Hamilton (1964) demonstrates the power of his model by applying it to an organism which is not diploid. In an organism where genetic investment in various offspring is not symmetrical, kin selection theory should predict a unique pattern of altruism, based upon the peculiar genetic mathematics of the organism. Such organisms can be found in the order Hymenoptera. The various species of hymenoptera (ants, bees, and wasps) are haplodiploid, which is to say that they may have either one or two sets of chromosomes. Females are diploid, and like all diploid organisms, they inherit 50% of their genetic material from each of their parents. In contrast, male hymenoptera are born of unfertilized eggs and are thus haploid, receiving all of their genetic material from the mother. Following Mendel's first law, then, hymenoptera offspring can only gain genetic material from one half of the mother's chromosomes, and the distribution from one offspring to the next is random. For the haplodiploid hymenoptera, this means that they are related to their offspring by the usual 50%, but to their sisters they are related 75%, as each of them will receive an identical contribution from the

father, in addition to the standard 25% of shared genetic material from the mother. This presents the extraordinary situation in which the degree of relatedness between hymenoptera sisters exceeds that between mother-offspring pairs, making the cost of altruism toward sisters lower than the cost of altruism toward offspring (since fertile sisters will spread more of a female's genes than will fertile offspring). The phenomenon of sterile female workers among the hymenoptera, who forgo reproduction and devote their energies to raising fertile sisters, is thus explained by Hamilton's theory of kin selection. What appears to be altruism, actually serves the inclusive fitness of the actor.

A striking instance of vertebrate kin selection was researched by Sherman (1980). It is a habit among Belding's ground squirrels Spermophilus Beldingi to signal the presence of a predator by climbing to a conspicuous perch and emitting a loud "alarm call" while gazing in the direction of the predator. This allows other squirrels in the area to locate the source of danger by observing the direction of the caller's stare. Unfortunately, it also makes the caller very easy for the predator to locate, and half of the squirrels who fall victim to predation are giving out with an alarm call just prior to their demise. Sherman's observations suggest that 10% of all encounters between Belding's ground squirrels and predators end in the

death of a squirrel, so being an alarmer is very risky business indeed, and would certainly seem to qualify as an act of altruism under the biological definition. According to the kin selection theory, a squirrel's willingness to give forth with an alarm call should be proportional to its potential gain in inclusive fitness, and this is just what Sherman found. Nearly all observed alarm calls were emitted by females. As it happens, female Belding's ground squirrels tend to live and breed in fairly close proximity to their juvenile families. By contrast, males disperse as juveniles nearly 10 times as far as females. Nor does fatherhood seem to do much to curb male wanderlust, as they continue their roving ways in successive years of breeding. The result is that the female spends her life in close proximity to a large number of close relatives, and is thus usually in a position to enhance her inclusive fitness by serving as an alarmer. Since the roguish male is very seldom to be found near his family, this sort of altruism is seldom cost-effective for the male squirrel. Sherman's data are perfectly consistent with what kin selection would predict about gender differences in squirrel altruism. Alarm calls almost always come from female Belding's squirrels.

Of course gender differences in the altruism of Belding's ground squirrels, and male-female differences in dispersal are only correlationally related here. It is

possible that males are selected to keep moving because they are poor alarm callers and thus present a liability to the group. It is also conceivable that a third gender-related factor is behind both phenomena. The kin selection explanation gains strength when one looks at the relationship between individual differences in female altruistic behavior and differences in the number of their surviving, nearby relatives. Sherman found that female squirrels with mothers, sisters, daughters, or granddaughters about were over three times as likely to call as those who had no relatives nearby ($p = .03$).

Kin Recognition

A critical assumption underlying kin selection theory is that animal relatives have some way of recognizing one another. Trivers (1985) reviews a number of mechanisms for kin recognition that have been uncovered by sociobiological research. He suggests that some species may be able to detect relatives by memorizing their smell. That animals can transmit complex pieces of information by releasing chemical scents (pheromones) is well documented (e.g., Valenta & Rigby, 1968; Gleason & Reynierse, 1969). This hypothesis is also consistent with psychological data suggesting that breastfed infants as young as one week of age can discriminate their own mothers' axillary odor from

that of other people (MacFarlane, 1975; Cernoch, & Porter, 1985).

Another line of research reviewed by Trivers suggests that some species are able to determine relatedness by a system of phenotypic matching, perhaps using the self as a model. He offers as an example the sweat bee (*Lasioglossum zephyrum*). Sweat bee nests are guarded by a sentry who admits only nest mates, and who seems to possess a remarkable capacity for determining degree of relatedness, favoring closer relatives over more distant ones. Artificial removal of newly hatched bees before they have any contact with nest-mates has no effect on their probability of being admitted to the nest, demonstrating that guards recognize relatives that they have never seen before.

Bees are not humans, of course, and despite the intriguing evidence concerning olfactory discrimination of mother in breastfed infants, the ability of homo-sapiens to reliably discriminate kin from non-kin on the basis of smell or other phenotypic characteristics is likely to be treated by most psychologists as questionable at best. While such a means of kin recognition may have existed at some point in our evolutionary past, it certainly seems to have little utility now. On the other hand, most contemporary psychologists would likely be quite comfortable with the notion that much of an organism's ability to detect genetic relatives is based on associative learning.

Trivers (1985) suggests that this may be a very common way in which animals learn to discriminate kin. The more socially sophisticated species spend a period of time in close association with their mothers and have an opportunity to witness siblings doing the same. One possible mechanism for sibling recognition may be simple association of certain individuals with preferential access to mother. Sherman's research with *S. beldingi* supports this notion. Twice during his study, females with one-year-old daughters disappeared before their new litters emerged from the underground nest. After the neonates emerged from the burrow, their one-year-old sister, having never seen them before, treated them as if they were non-kin. Sherman's data also point to a learning factor in mother-child recognition among *S. beldingi*. In instances where infant squirrels emerged from the nest for their first time and returned that same evening to the wrong nest, their new "foster" mothers treated them as part of the family. The importance of these data to a general theory of kin selection, lies in their suggestion that simple, associative learning (of which humans are certainly capable) plays an important role in the ability of a species which clearly demonstrates kin-biased altruism to detect genetic relatives.

Kin Selection in Human Altruism

An easy criticism of kin selection as a paradigm for human altruism would seem to reside in the fact that, in our Western society, few of us live in close proximity to very many of our kin. Such an argument is unimpressive to the sociobiologist, who takes a much longer historical perspective on behavior than do most psychologists. Homo sapiens has evolved under a set of conditions quite different from those of contemporary Western society, making this society a poor paradigm in this instance. Wilson (1977) expresses the sociobiological perspective when he states that our cultures are "jerry-built on the Pleistocene". This statement needn't be interpreted as meaning that human culture and learning are unimportant contributors to our behavior, merely that the biological aspect of human motivation evolved, for the most part, in the absence of culture as we now understand it, and that this precultural motivational system likely had an important impact on the cultural institutions that we have generated. Seen against this framework, modern human prosocial behavior is driven by an affective motivational system which evolved to serve the same fitness-oriented altruistic behavior observed in so many different species. Further, the various cultural institutions that have been established to support and encourage human altruism, and which certainly must explain much more of our social

behavior than does our biology, were themselves constructed by ancestors subject to the same set of motivators. Thus our cultures are, in a sense, "jerry-built" on a motivational system designed in and for the Pleistocene. This may help to explain the amazing diversity of our cultures, as each has found its own unique way of adapting the old organism to the new environment it is helping to create. Far from threatening human society (and human social scientists) the evidence unearthed by sociobiology would appear to make human culture, and those who study its influences, all the more important. In fact, the search for kin selection in our species has led the sociobiologist into the anthropological and psychological literatures for examples. Some of the relevant literature from both fields is reviewed below.

Evidence of Kin Selection Among Humans

A powerful design for estimating the genetic factor in human behavior involves comparing concordances within monozygotic (MZ), and dizygotic (DZ) twin pairs. The great difference in shared genetic material between these two groups provides researchers with an equally powerful mechanism with which to study the influence of kinship on altruistic behavior. Segal (1984) utilized an MZ/DZ design to study cooperation within 5- to 10-year old twin pairs. Thirty-four pairs of MZ twins and 13 pairs of DZ twins were

set to work on a difficult puzzle solving task while researchers coded their cooperative and competitive behaviors. The MZ twins were significantly more likely to keep the puzzle equidistant between themselves during the session, attend to one another's contributions to the task, and direct positive facial expressions (e.g., smiles) toward one another. In contrast, the DZ pairs were significantly more likely to engage in physical aggression during the session. Perhaps the most striking result of Segal's study concerns the relative success rates of the two groups. Although the groups were matched for I.Q., 94% of MZ pairs completed their puzzle within the allotted time period compared with only 46% of DZ pairs. In a second phase of her twin study, Segal gave her subjects the task of tracing pictures of trees with a red pen. Subjects either earned points for themselves (competitive condition) or for their twin partner (cooperative condition) by completing the task within a prescribed time period. Not surprisingly, all subjects worked harder for themselves than they did for their partner, however the MZ twins worked significantly harder for each other than did DZ twins.

A common criticism of the use of MZ twins in behavioral research is that they constitute a unique, and perhaps unrepresentative, subpopulation within the greater human population. In contrast to hymenoptera sisters,

human MZ twins account for only a very small proportion of their species. A finding of differential altruism among more common genetic and social relationships might be more meaningful. Essock-Vitale and McGuire (1985) solicited retrospective accounts of instances of receiving help from 300 women, and found that help exchanges between genetic relatives accounted for nearly 36% of the total reported while help received from non-genetic relatives (including spouses) accounted for only 21%. Of course, the greatest single source of help seems to be non-relatives (43%), suggesting that kin selection is, at best, one of many factors involved in human altruism. However, it is noteworthy that the authors reported a relationship between the degree of help involved in a given exchange and the degree of relatedness between the participants.

The relationship between degree of relatedness and altruism was studied in a pair of experiments reported on by Michael Cunningham (1986). In the first study, subjects were asked to indicate their willingness to help 14 potential beneficiaries who differed in their relative social power and in their degree of personal as well as genetic closeness to the subject. Acts of altruism were arranged in three categories by the type of sacrifice involved (physical, monetary, and dangerous), three levels of cost were involved in each category. For example, in the category of helping in dangerous situations, the

situations ranged from entering a burning building to help someone on the second floor, to swimming half a mile to perform a rescue, to jumping on a terrorist hand-grenade with a 75% chance of death and a certainty of serious injury. Correlations between the percentages of subjects willing to help in each of these nine categories and the degree of relatedness of the target revealed that the latter accounted for fully half of the variance in the former. When the spouse and best-friend were dropped from the equation, 94% of the variance in willingness to help was accounted for by degree of genetic relatedness. Many of the particular details of Cunningham's data are even more supportive of a kin selection factor. For example, altruism toward spouses (who are a reproductive resource) averaged as high as altruism toward genetic relatives including the first-born offspring. On the other hand, grandparents (who are generally not a reproductive resource) were less likely to be chosen as beneficiaries of high-cost altruism.

Cunningham reports on a second study in which subjects were asked how many hours they would be willing to sacrifice to help a single relative. The degree of relatedness of the target was manipulated, as well as his or her potential to reciprocate. Again, the higher the coefficient of relatedness, the higher the degree of sacrifice subjects were willing to endure. Cunningham found no

relationship between willingness to give time and potential reciprocity.

Kin Selection in Moral Reasoning About Altruism

As psychologists we are interested not only in subjects' self-reports of who they would be likely to help, but why they would behave differentially toward different individuals. The cognitive dimension of altruism is of interest to a number of researchers in psychology (e.g., Iannotti, 1978; Eisenberg-Berg & Hand, 1979). A classic psychological study of kin selection in adolescent moral reasoning about altruism was conducted in 1973 by Sebastian (reported by Freedman, 1979). She borrowed Kohlberg's (1964) well-known dilemma of "Heinz and the Drug", manipulating the degree of relatedness of the person needing the medication. The results were that 79% of Sebastian's adolescent subjects felt that Heinz should steal the drug in order to save his daughter, while only 55% felt that he was justified in stealing to save the life of a friend. When subjects were presented with a choice between giving the drug to a sibling as opposed to giving it to a friend, no subject chose the friend (although five did refuse to state a choice). Content analysis of the rationales given by subjects for their choices revealed that the central issue in kinship situations was the saving of life, while in the non-kin situations the central issue was stealing.

The research cited above used adolescents and adults as subjects. It would be of greater interest to the present study to know if this kin bias is characteristic of children, as parental socialization for altruism takes place during the childhood years. Freedman (1979) cites a 1977 study by Ginsburg on the ontogeny of kin bias in children. Ginsburg asked children of various ages if they would save their playmate or their parents if such a choice were forced upon them. Three- and four-year olds invariably chose to rescue their playmate. Kin bias began to emerge in the six- and seven-year-old subjects. These data are consistent with the psychoanalytic timetable for resolution of the Oedipal conflict, and the cognitive developmental literature on the ontogeny of social cognition, which shows a shift in relevant factors such as role taking ability which accompanies the shift to operational schemata at around this age (e.g., Selman, 1976, 1980). Ginsburg's data also suggest that kin bias, while not present at birth, does emerge in a predictable fashion in human beings.

Kin Selection Across Cultures

Anthropologists have been among the harshest critics of sociobiology, and, as one might imagine, much of this criticism has utilized data on cultural variation.

Ironically, a number of powerful arguments in support of human kin selection have emerged from this assault.

Marshall Sahlins has been at the forefront of the attack since quite early on. Sahlins (1976), asserts that the ethnographic record on kinship and family/marital organization renders an explanation of altruism based on a simple coefficient of relationship untenable. He cites as an example, cross-cultural variation in postmarital residence. In matrilocal societies, individuals often lose sight of paternal blood ties, while in patrilocal societies contact with maternal relatives is lost. In either case, individuals find themselves sharing with and pledging allegiance to relatives with whom they share a smaller coefficient of relationship than they do with others who live further away, and who are often treated as strangers or even as enemies. Freedman (1979) takes issue with this argument, pointing out that the very fact that some form of kinship system (even if imperfect, as in Sahlins' examples) is universal. In no instance cited by Sahlins, is the tracing of individual lineage a matter of complete indifference. Kinship does, in fact, seem to be an important factor in organizing human social behavior, and societies will make a systematic effort to preserve at least partial kinship lines intact even when environmental conditions make this difficult.

Another of Sahlin's criticisms concerns the Polynesian opu system which traces descent from a common ancestor. The choice of these ancestors is often arbitrary with the result that two genetic brothers can belong to different opu. Since property rights and obligations are based on the opu relationship, this would indeed seem to present a problem for a kin-bias explanation of altruism. Freedman again addresses this challenge suggesting that the existence of such an overlapping system of kinship may be an artifact of the relatively high degree of endogamy that life on an isolated island would predict. It may be that in a culture where most individuals can expect to share some degree of familial relationship to most others in the society, inclusive fitness is best served by a looser definition of kinship. Freedman points out that a number of other cultural institutions unique to Polynesia can be so explained, including the high rate of adoption or hanai. Studies of the institution of hanai cited by Freedman suggest that genetic kinship, far from being ignored in the Polynesian family, remains an important factor in the lives of adopted children. For example an ethnographic study of Tahitians by Levy (1973) found that adoptees always knew who their blood relatives were, that these relationships remained important to them, and that the majority of adoptions involved close kin. Information such as this

suggests that the Polynesian opu concept represents a more liberal concept of kinship, rather than a renouncement of kinship, and that it does not entirely replace traditional family ties.

Other anthropological observations have been openly embraced by the sociobiologist and incorporated into kin-selection theory. Perhaps the best sociobiological theorist best known in this regard is Richard Alexander (1974, 1975, 1979). One of Alexander's favorite anthropological paradoxes is the "mother's brother" phenomenon in which responsibility for a woman's children falls not on her husband, but on her brother. On the surface, this would indeed seem paradoxical in terms of a genetic fitness explanation of altruistic behavior, since we find males supporting 25% relatives rather than 50% relatives. However, Alexander (1974) points out that in societies practicing mother's brother child-support, cultural practices regarding sexual behavior render paternity dubious, regardless of the social father. Under such a circumstance, a man's support for his sister's child (a certain 25% relative) makes sense under an inclusive fitness model. Perhaps more important, it is difficult to imagine another model which would explain such a phenomenon as simply.

Another cultural anomaly which seems to refute kin selection, but which Alexander believes supports it, is the

habit within some societies of distinguishing between "parallel-cousins" (offspring of siblings of the same sex), and "cross-cousins" (offspring of siblings of the opposite sex), treating the former as more closely related than the latter. Ordinarily one would predict that both types of cousin would be identically related (12.5%). As it happens, Alexander finds a significant correlation between societies which make such a cousin distinction, and the institution of polygyny, in which a single male may have more than one wife. As a man's wives are often sisters in these societies, it may be the case that parallel cousins are also half-siblings, and are indeed more closely related than are cross-cousins.

Like anthropologists and sociobiologists, psychologists have an interest in the issue of cultural variation in the kinship-altruism connection. Recently, University of Hong Kong psychologist Hing-Keung Ma has studied differences in Chinese and English subjects' reasoning concerning altruism and kinship. Taking a cue from Sebastian, Ma (1985a) modified Kohlberg's dilemma of "Heinz and the Drug", varying relationship between the protagonist and the person needing of the drug. In Ma's initial study 78 Chinese and 213 English tenth and twelfth graders were asked if Heinz should steal the needed medicine for a spouse, an offspring, a best friend, or a stranger. Ma

found that degree of relatedness was equally predictive of altruism for both samples with the parent-child relationship generating the most positive responses. The only significant group difference occurred when the target of the altruism was a stranger. In this instance, the English subjects were more likely to respond affirmatively. This result is consistent with data from the cross-cultural study of self-reported altruism conducted by Johnson and his colleagues. Korean and Taiwanese subjects in that study scored lower than subjects from Western nations on the altruism scale which was biased toward rendering help to a stranger. A follow-up study is under way to determine if manipulating the target of altruism (friends and relatives vs. strangers) alters the relative scores of Asian and Western respondents. Preliminary analysis suggests that this is indeed the case. Studies such as these suggest an interaction between cultural variables (e.g., the traditional Asian support for kin-based altruism) and the degree to which systems not dependent upon simple kin selection manifest themselves. MacDonald (1984) points out that the lack of reliable mechanisms for kin recognition among humans means that we are dependent upon cultural institutions to focus our evolved tendencies to help our relatives. In urban industrialized societies, where such cultural institutions are weak or nonexistent, these evolved tendencies toward kin-biased altruism spill over

such that we find ourselves often helping individuals in whom we have no genetic investment. The fact that kinship remains an important factor in cultures in which family reciprocity is not well supported speaks strongly for the notion that kin-bias plays an important part in predicting many instances of human altruism. I also suggests yet another important role for parents and the family in the molding of the altruistic personality, in that family members provide the model for the beneficiaries of our altruism. To the degree that within-family altruism is differentially encouraged in different families, one would anticipate individual differences in the adult altruistic personality profile.

Trivers' Theory of Reciprocal Altruism

Examples of kin selection in nature are plentiful, and psychological research with human subjects has revealed within our own species a marked tendency to favor close relatives over strangers as regards altruistic acts (e.g., Sebastian, 1973; Ma, 1985; Johnson et al., work in progress). Nature also provides numerous instances of altruistic acts directed toward non-kin, and these are not as easily explained under Hamilton's model. To the degree that an individual or a kinship might expect altruistic behavior toward non-kin to be returned, altruism directed outside the kinship would be predicted. Robert Trivers

suggests that nature has selected for just this type of "reciprocal" altruism in a number of species, including our own, and he has elaborated on this premise in his theory of reciprocal altruism (Trivers, 1971, 1985). As in the case of kin selection, altruism under the theory of reciprocal altruism is predicated on a cost-benefit model with genetic fitness as the medium of assessment. The concept is elegant in its simplicity: if organisms trade altruistic acts over a period of time, there will be a net profit in individual fitness for both parties provided that 1) benefit to recipient exceeds cost to altruist for individual acts of altruism, and 2) nobody cheats the system (i.e., reaps the benefit of altruism but fails to reciprocate). The model leads to a number of testable predictions regarding animal behavior. First, altruism should favor those in greatest need to insure that benefit exceeds cost. Further, since the net benefit to both parties can only be optimized by exchanges of altruism over a period of time, reciprocal altruism should be associated with individuals who interact frequently. Trivers (1985) supports each of these predictions, citing the research of Gerald Wilkinson (1984) on the vampire bat (Desmodus rotundus). Vampire bats feed off the blood of large mammals during the night. Of course large mammals are selected to avoid feeding these parasites, and some bat forays are more successful than others. Very young and very old bats are particularly

prone to periods of failure to feed. Maximum individual fitness among vampire bats depends on a system of reciprocal altruism in which well fed animals see their less successful neighbors through the lean times by regurgitating blood to them. Wilkinson captured vampire bats and starved a subset of them before returning the captives to their environment. He found that neighbors were differentially altruistic depending upon the need of the experimental animal (measured in terms of hours remaining until total starvation), thus demonstrating a sensitivity to the cost-benefit aspect of altruism. He also observed that frequency of interaction predicted altruism in his subjects. Food regurgitation occurred only in instances where altruist and beneficiary were observed together at least 60% of the time.

Frequency of interaction is an important variable in reciprocal altruism. If the mathematics of reciprocity is to work out such that both parties can expect a net gain in individual fitness, a large number of instances involving altruism is required. This means that species exhibiting reciprocal altruism should be expected to enjoy a fairly long life-span, and this seems to be the case (Trivers, 1985). It also means that social conventions should evolve which encourage long-term commitments between individuals (e.g., friendships and multiparty alliances). Trivers (1985) cites the field research of himself and Irven DeVore

with baboons in this regard. Like males in many social vertebrate species, baboons form linear dominance hierarchies in order to determine access to resources and to available females. In addition to these linear hierarchies, male baboons form what Trivers refers to as "central hierarchies", or alliances between individual animals which enable them to dominate others. There are cases in which the dominant baboon in the linear hierarchy is not a member of the central hierarchy. In these instances, it is possible for the baboon "gang" to dominate the dominant individual in the troupe. This was the case in the troupe that DeVore and Trivers studied. They observed three separate occasions in which a particular member of the central hierarchy mounted a female who was at the height of her estrus in defiance of the authority of the dominant male baboon. In each instance the dominant male attempted to charge the happy couple and break up their copulation, and in each instance one of the other members of the four-male central hierarchy interposed himself between the dominant ape and the mating couple. Here is a case of a stable alliance formed for the purpose of enhancing the individual fitness of at least one of its members; but are these alliances truly reciprocal? According to the research of Craig Packer (cited in Trivers, 1985), pairs of baboons who form alliances against a more dominant third male do indeed trade off mating

privileges over time. Packer also observed that males who most frequently rendered this sort of assistance were most often aided themselves. Baboons, then, demonstrate both an institution of long-term commitment which facilitates reciprocal altruism and a sensitivity to the issue of equity in the reciprocal relationship.

In addition to predicting cost-benefit sensitivity and preferential treatment of regular companions, reciprocal altruism predicts that there will be occasions upon which individuals will find it adaptive to cheat the system. At first blush, the fact that reciprocal altruism leaves open the possibility of a successful cheating strategy would seem to be detrimental, if not fatal, to the theory. As it happens, the notion of competing strategies of cheating and honest reciprocal altruism explains a good deal of animal behavior. Among the implications of this competition among strategies are the following:

1. The cheating strategy should be most effective in situations where individuals interact very infrequently, since non-reciprocation is expected to result in the loss of future altruistic benefits to the cheater.
2. With the possibility of cheating ever present, reciprocal altruism should lead to a selection for the ability to recognize cheaters.
3. Selection should favor harsh treatment of cheaters once they are found out.

4. Once a set of traits has evolved to regulate the system of reciprocal altruism, selection should favor mimicking these traits in order to influence the behavior of others.

Trivers (1985) finds evidence for most of his predictions in the behavior of birds. Male birds seem to work out a system of mutual restraint regarding the protection of territorial boundaries. They learn the distinctive songs of their immediate neighbors, and respond to a neighbor with less aggression than they would to a stranger. This avian detente holds as long as the neighbor's song issues forth from the center of his own recognized territory. If a bird should be so bold as to violate protocol by calling out from the side of his neighbor's territory opposite from his own territory, the implicit peace treaty between them is declared null and void and the wronged party will respond appropriately. By carrying out his mating ambitions at an additional border of his neighbor's mating territory, the bird is taking unequal advantage of the reciprocal relationship: he's cheating. The cheated bird recognizes this and responds by withholding altruism. Whether such withholding of altruistic restraint constitutes the type of moral aggression that predicted by reciprocal altruism is surely questionable, however Trivers (1985) relates an anecdote from de Waal's (1982) study of chimpanzee behavior which demonstrates

clear moral retribution directed against a cheater. A chimp had helped defend another against aggression from a third. Later, when the roles were reversed and the erstwhile altruist was in need, her gestures went unheeded by her former ally and she was abandoned to the aggressor. The offended ape responded by chasing after the errant ally, barking and striking at her. Interestingly, the two had made up before the day was out. Trivers' theory would predict such ultimate resolution of disputes between reciprocal altruists, as it is in the best interest of all concerned that the cheater be allowed to mend his or her ways and re-enter the mutual helping relationship.

As beneficial as such a system of mutual altruism is to all participants, it is still most beneficial to one who can successfully and consistently cheat. If one can receive repeatedly the benefits of altruism while avoiding both reciprocation and moral retribution, one has a powerful mechanism indeed for supporting individual fitness. Trivers (1974) offers an example of successful cheating from the literature on cleaning symbiosis among fishes. A number of species of marine life have evolved which feed off of ectoparasites which lodge in the scales of larger fish. Although the cleaners would make a fine meal for the fish they service, the elimination of the cleaners would lead to the death of the larger fish from disease and so restraint is selected for. In fact, the

larger fish will often risk itself in the defense of the cleaner further demonstrating altruism. Eibl-Eibesfeldt (1959) studied two species of false cleaner fish, which mimic the appearance and behavior of the true cleaners, but which ultimately bite chunks out of the fins of the larger fish rather than cleaning them. These cheaters are quick enough to dart away before suffering any consequences, and the good work of the species that they impersonate maintains their good reputation with their prey. Trivers points out that the ability of reciprocal altruism to withstand the evolution of entire species of cheaters attests to the value of reciprocity to individual fitness.

Human Reciprocal Altruism

As was the case with kin selection, Trivers' theory has implications for the evolution of altruism in humans as well as in non-human species. Some of the predictions of the theory of reciprocal altruism as it relates to non-humans were reviewed above. In his original paper introducing reciprocal altruism, Trivers (1971) recast and expanded on these in his attempt to apply his theory to our own species. The following is a synopsis of Trivers' essential predictions regarding altruism in humans:

1. We should not expect people to be complete altruists. Given the benefits which accrue to successful

cheaters, it is anticipated that people will indeed cheat if they can do so and get away with it.

2. If someone is caught cheating, it is expected that he or she will be dealt with harshly. Moralistic aggression is a logical mechanism for protecting the fragile system of reciprocity.

3. Under normal circumstances people will be expected to be more altruistic toward friends than toward strangers, as friends are more likely to be in a position to reciprocate at a later time.

4. Given the beneficial nature of reciprocal altruism, and the important role of friendship in reciprocal arrangements, we should be selected to readily initiate and cement new friendships. Under this hypothesis, we should expect traits such as gregariousness and extraversion to correlate positively with altruism.

5. People should be sensitive to the cost/need relationship of a given altruistic act. The more you sacrifice in a given act of helping, the more credit you should anticipate receiving. Further, the greater the perceived need of a potential beneficiary the greater should be our willingness to sacrifice.

6. There should be a selection toward guilt and the desire to make reparations. It is in the best interest of a cheater who has been found out and those who have been cheated if the cheater turns trustworthy and rejoins the

reciprocal relationship, since ultimately reciprocity works to the advantage of all participants.

7. Given that reciprocity is associated with such features as friendship, moralistic aggression, guilt, and pity (forgiveness), selection should favor mimicking those traits in order to manipulate others to behave altruistically toward us (recall the false cleaner fish studied by Eibl-Eibesfeldt). In other words, Trivers anticipates a certain degree of selection for hypocrisy.

8. On the other hand, we should also be selected to spot hypocrites, lest the entire reciprocity system break down under the stress of massive abuse.

9. The human reciprocal system is expected to be both complex and plastic. The developmental plasticity of the organism allows it to learn to curb its guilt when it is adaptive to cheat. In short the morality we learn from our parents is often rather a relative one.

Each of Trivers' predictions will be addressed separately, with the single exception that the related issues of hypocrisy and the spotting of hypocrites will be treated together.

Cheating. Psychology's own version of reciprocal altruism is embodied in the "norm of social responsibility", which states that each of us is obligated to help another in need, regardless of the personal cost of helping (e.g., Berkowitz & Daniels, 1964). If the past several

decades of research on helping behavior have revealed anything at all it is that people often welfsh on this particular clause of the social contract when given the opportunity to do so. The brutal murder of Kitty Genovese in full view of thirty-eight of her unresponsive neighbors stimulated a good deal of public interest in such failures of human altruism, and, ultimately, a good deal of research on the subject. John Darley and Bibb Latane were among the first to attempt to fathom this sort of mass apathy, and their research suggested that people will fail to respond to a person in need when they feel that there are others present who might do so instead (Latane & Darley, 1970). It seems that when other equally qualified potential altruists are about, the tendency is to opt out of making a contribution to a neighbor who is in need. Latane, Nida, & Wilson (1981) attribute this failure to intervene to social comparison, suggesting that when others fail to intervene, the situation is interpreted as less serious. One might also interpret such readiness to pass the obligations of the social responsibility norm on to the next guy as a strategy which serves to maximize one's individual fitness. The diffusion of responsibility afforded by the presence of other non-responders allows one to fail to act altruistically with less fear of retribution or loss of potential future altruism. In short, it facilitates cheating on the system of reciprocal altruism. This theme of diffusion of

responsibility has been investigated in other, less dangerous and violent settings with similar result. For example, Freeman, Walker, Borden and Latane' (1975) uncovered a fact that restaurant employees have always known: The larger the number of diners at a table, the smaller their individual tips.

The diffusion of responsibility made possible by the presence of other non-responsive bystanders provides a cheater with a handy means of cheating without suffering social repercussions. In many situations, individuals opt not to honor the norm of social responsibility without benefit of the anonymity provided by the presence of fellow cheaters. To do so places one in the position of having to explain oneself, and so a degree of cognitive restructuring of the event in question is anticipated. Such restructuring may take the form of defensive denial, a distortion of one's judgement of the need for help in a situation where one failed to offer it. (Schwartz, 1977; Schwartz & Howard, 1981). The idea behind defensive denial is to deny that the norm of social responsibility applies to a given situation by denying that the situation calls for assistance. The tendency to engage in this process of minimizing the importance of a situation should increase as a function of the cost of helping. Tyler, Orwin, & Schurer (1982) tested this notion on a group of dormitory residents at Northwestern University. Subjects were asked how

willing they would be to help others by reducing their energy consumption. Students lived in rooms fitted with individual air conditioning units, and the interviews were conducted during the summer. Half of the subjects were told that the university was considering alternatives to voluntary energy conservation, including a mandatory 10 percent reduction in energy consumption, removal of the air conditioning units, and billing individual rooms for electricity. In interviewing the other half of sample, no mention of potential personal costs was made. As predicted, students who had the cost conservation measures "brought home" to them reported that they believed the energy crisis to be less serious than those who were simply allowed to insulate themselves from consideration of cost over need issue.

Rationalizing one's way out of compliance with the norm of social responsibility can take the form of minimizing the victim as well as minimizing his or her need. The phenomenon of "victim derogation" has been well researched by social psychologists. In the classic study, Lerner & Simmons, (1966) showed subjects video image of a woman participating in a learning experiment who was punished for wrong answers with an electric shock. The woman was a confederate of the experimenters and in no real pain, but subjects were led to believe that she was experiencing a good deal of pain. Half of the subjects in this study were

given the opportunity to help the "victim" of the learning experiment by voting to have her taken off the punishment schedule and placed on a reward schedule under which she would be paid for correct answers. Other subjects were not given this opportunity. When asked to evaluate the victim, those who had no opportunity to help gave her lower ratings than those who had helped her escape her plight. Data from this and subsequent similar experiments led Lerner to propose the "just world hypothesis", which states that people need to believe that people get only what they deserve out of situations. An extension of the just world hypothesis is that if one witnesses suffering or need in another, and cannot (or will not) help, then it must be true that person deserves his or her fate. Such a rationalization was recently employed on the floor of the U. S. Senate by Senator Jesse Helms of North Carolina who justified his refusal to dedicate tax dollars to fight the AIDS epidemic by suggesting that victims of the disease brought their condition upon themselves by virtue of their "immoral" lifestyle.

Moralistic Aggression. It is common wisdom that nobody likes a deadbeat, and research bears this out. When thirty-eight of your friends and neighbors fail to come to your aid it is difficult to assign blame, but in a situations where reciprocal roles and requirements are clearly delineated, failure to meet one's obligation to help is not

well received. An interesting ethnographic of study of Israeli children by Katriel (1987) illustrates this point. Amongst Jewish Israeli children, there exists a powerful custom of ritualized sharing known as xibudim. Xibudim requires that a child who possesses a treat or snack must share it with others of his or her party. Children invoke the norm of sharing by shouting "bexibudim!" repeatedly after the fashion of a chant whenever one of their party purchases a snack. Not to respond to this plea is considered an affront (the word is derived from the verb lexabed, literally, "to respect"). Such a transgression requires a good explanation from the non-altruist lest he or she be branded "miser", "pig", and subjected to public ridicule and gossip within the group. Consistent cheaters face the possibility of being ostracized by the group altogether. The ritualized nature of xibudim makes it relatively easy to spot cheaters and engage in this sort of moralistic aggression.

There are options available to the purchaser of a snack who wishes to avoid sharing it. One option is to shout "bli xibudim!" ("without sharing") upon declaring one's intention to purchase the snack. For this approach to be legal, one must make one's declaration not to share before the "bexibudim" chant begins. Even then, abuse of this privilege will often make one the butt of gossip within the group. Another ploy is to claim that the food

item is one's breakfast or lunch. This requires that the excuse be believable (i.e., the item must be substantial), and, again, overuse of this strategy will bring on the wrath of the peer group. Even failure to share spontaneously (i.e., without being chanted at) sufficiently often will bring on moralistic aggression from the peer group.

In most situations in our society, failure to honor the system of reciprocal altruism is not as clearly visible as in the above example. However, the delicate American sense of justice and moral outrage is in ample evidence. Our willingness to sue, boycott, appeal to government or industry "watchdog" agencies, etc. are all indicative of our capacity for moralistic aggression in cases where we feel that the reciprocal account is out of balance. The race riots of the 1960's may be seen as moralistic aggression inspired by centuries of failure on the part of the white majority in America to compensate the black minority for their contributions to system of reciprocity upon which the nation is founded.

Favoring Friends. A system of mutual helping requires a long term relationship, and so we would expect more altruism to be directed toward friends than toward strangers. The previously mentioned research of Ma suggests that this is so. Ma (1985b) presented 519 English and 400 Chinese adult subjects the following dilemma: "You

and X are in a boat which is sinking, but only you or X can be rescued. Would you sacrifice yourself so that X could be rescued if X is: A young stranger, 20 years old? An old stranger, 70 years old? A famous scientist who is a Nobel Prize winner? An immediate relative? Your best friend? A postman? Someone you dislike? A child, 6 years old? Subjects then rated each choice on a seven point scale (definitely yes to definitely no). From this data, Ma derived a five level "hierarchy of human relationships". Predictably blood relatives head the list of people subjects would die for, and they are followed in order by best friends, the young, weak, or elite (e.g., Nobel laureates), common strangers, and enemies. This pattern held up across both samples, although Ma's Chinese subjects reported a greater willingness to sacrifice for friends and young, weak, or elite others than did Englishmen.

The tendency to favor friends over strangers when distributing altruistic favors appears rather early in the lifespan. Birch & Billerman (1986) found that their preschool subjects were more likely to make a sacrifice (such as sharing a favorite snack) for a friend than for a mere acquaintance. Kanfer, Stifter, & Morris (1981) tested the willingness of 3- to 6-year olds to delay gratification in order to benefit another. Subjects were given the option of playing with an assortment of attractive toys, or

engaging in a task (chip sorting) which earned them prize tokens. They were told that the tokens would be used either to buy a toy for an anonymous "other child", a classmate chosen by the experimenter, or a friend. While only 5% of the subjects were willing to do any work for a stranger and only 25% worked to benefit a classmate, over half (55%) were willing to do work for a friend's benefit, and 50% worked the full 15 minutes for the benefit of their friend.

The anthropological literature provides us with an example of the extremes to which reciprocal altruism can be taken among friends. Barash (1979) reports that the Chukchee people of Siberia once pushed friendship to a limit few in the West would endure. Chukchee men once managed large herds of reindeer over great distances, and this kept them apart from their wives for extended periods of time. Marriage is a fine example of a reciprocal relationship, but we have already observed that people will often cheat their reciprocal relationships when they can get away with it, and such was the inclination of the Chukchee herders. In order to preserve both the peace and some reliable claim to paternity, Chukchee herders would enter into formal wife-sharing arrangements based upon friendship and mutually compatible travel routes. These arrangements, presented the Chukchee with the dual advantages of assuring that no one went without a partner for

an extended period of time, and that no one was supporting the offspring of another man who was not also supporting his offspring. The whole affair was kept between friends.

Making Friends. If friends are critical to reciprocal altruism, and reciprocal altruism is valuable to one's individual fitness, then friends are a valuable asset which we should be eager to seek out. Barash (1979) again reports on some of the anthropological data which support this notion. For example, if a Rwala Bedouin returns your greeting, he has committed himself to render help to you in the future. An important reciprocal alliance is thus formed by a simple exchange of greetings. The Latin American compadrazgo system is another example of an institution which solidifies reciprocal alliances. Here, not a mere friendship, but literally a kinship is forged in the absence of any genetic relationship. Two otherwise unrelated sets of parents become compadres/comadres, assuming many of the rights and responsibilities of kinship, including responsibility for one another's offspring should the need arise.

One study out of the developmental psychology literature is of particular interest regarding the importance of forging new reciprocal alliances. Wright (1942) asked 8-year-old boys to divide two toys that differed in attractiveness between a good friend and a stranger. Many of the boys opted to give the more attractive toy to the

stranger. When Wright followed up on these boys he found that they acted as they did because they felt that their relationship with their friend was strong and secure. Another way of putting this might be to say that the friendship was strong enough to stand a little cheating. More important to the present issue, these boys reported that they felt that by offering the more attractive toy to the new boy, they might make a new friend.

Cost/Need Sensitivity. There is good evidence from the psychological literature that people regulate their altruism according to the perceived need of the beneficiary. This tendency has been observed even in young children. Ladd, Lange, & Stremmel (1983), presented children in kindergarten through the fourth grade with the opportunity to help another child with his or her homework and found a tendency in all age groups to offer the most help to those who needed it most. These results were particularly significant since they suggested that the tendency to help those in greatest need overwhelmed the traditional tendency for children to help members of their own sex. In another study Midlarsky and Hannah (1985) found that children between the ages of 6 and 16 were more likely to help an injured toddler than an age mate who had suffered an identical injury. Finally, Ma (1985b) found that subjects reported being more willing to assist

strangers if they were presented as weak, sick, or of an extreme age.

Trivers' prediction that human altruism will demonstrate sensitivity to the extent of the beneficiary's need seems to be well supported. What of the related prediction that cost is a factor in helping? A number of studies from the social psychological literature address this issue. From the standpoint of genetic fitness, potential physical harm is a cost factor of great interest, and several studies have shown that the presence of such a possibility is indeed a deterrent to helping (Midlarsky & Midlarsky, 1973; McGovern, 1976; Shotland & Straw, 1976; Borofsky, Stollak, & Messe, 1971). Other studies have looked at cost factors of a less extreme nature finding that bystander intervention is negatively affected by factors such as investment of time and effort, (e.g., Darley & Batson, 1973; Batson, Cochran, Biederman, Blosser, Ryan, & Vogt, 1978).

Jane Piliavin and her associates provide an informative review of the literature on bystander intervention utilizing a model which includes a cost-benefit perspective very compatible with that of Trivers (Piliavin, Dovidio, Gaertner, & Clark). Under Pialiavin's model, individuals consider both cost of helping (to the benefactor) and cost of not helping (to the beneficiary) when deciding whether or not to intervene. She predicts that when costs of

helping are low to moderate, helping should increase as a function of increases in a victim's need for help. This relationship will not hold, however, when the cost of helping is high. With high costs of helping, victims should anticipate indirect help at best, and very likely no help at all. Further, individuals who fail to render help in such high-cost situations, should be expected to minimize their own personal cost of not helping (or what Piliavin refers to as "empathic cost") by engaging in cognitive reinterpretations of the situation such that the perceived cost to the victim is minimized. Piliavin finds ample evidence for her predictions in the literature, including the literature on "just world" rationalization practices such as victim derogation.

There is a good deal more evidence for cost/need sensitivity than can be accommodated here, and a good deal more research should be done in this area by way of testing the notion of reciprocal altruism. For example, if Trivers is correct in attributing our sensitivity to cost factors to a need to enhance or defend our individual fitness, then we should expect to see lifespan-developmental trends in cost-sensitivity. Specifically, one should expect to see cost of helping lose some of its grip on the probability of helping as an individual's fitness becomes more secure. For example, an individual with an independent, adult offspring should be less inhibited by high cost

(particularly in situations involving physical danger) than a person with young, dependent children, or no children at all. Presumably, other factors held equal, grandparents should be still less cost sensitive.

Guilt and Reparations. The powerful grip of reciprocity on people in all cultures is well illustrated when the reciprocal account is forced out of balance. The Ming emperors of China understood the power of reciprocity and used it to their advantage in their dealings with Europeans attempting to make inroads into the Chinese market. A European trader, attempting to court the emperor with gifts, found his generosity consistently overwhelmed by more costly and spectacular gifts from his host. No matter how precious the European's offer, he inevitably found himself leaving the encounter even further in the emperor's debt. Barash (1979) points out that Kwakiutl Indian chiefs of the Pacific Northwest also utilized the norm of reciprocity as a weapon against rivals. Kwakiutl chiefs competed with one another at their traditional potlatch feasts to determine who could give away the largest amount of food or the greatest number of blankets. The most magnanimous chief was recognized as the greatest among the nobility, and those he out-spent were saddled with shame until they could set the reciprocal balance straight.

The tremendous power of guilt in instances where reciprocity is violated is confirmed in the psychological literature. Johnson, et al. (1989) found a significant positive correlation between a measure of guilt and scores on a self-report altruism scale. In addition to this correlational data, a number of experimental studies have shed some light on the nature of this relationship between receiving help from another and emotional dissonance. Jeffrey Fisher and his colleagues (Fisher & Nadler, 1974; Fisher, Harrison, & Nadler, 1978) found that perceived similarity between donor and self was a factor. The similarity factor is particularly germane to Trivers' model, since it implies a similarity on the need dimension. For example, in the Fisher, Harrison, & Nadler (1978) procedure, similarity was manipulated by describing the helper's task-relevant background to the recipient of help (suggesting that it was either equivalent to or greater than the beneficiary's).

In yet another experiment, Fisher and his colleagues manipulated both degree of imbalance in the reciprocal relationship and the friend versus stranger status of the helper. Nadler, Fisher, & Itzhak (1983) utilized a 2 (friend vs. stranger) x 2 (ego-relevant vs. non ego-relevant help) x 2 (help given once vs. twice) between subjects design on a sample of Israeli men. Ego relevance was determined by the degree to which the task required

intellectual skill, and this had the predicted effect of enhancing dissonance over having been helped. Aside from the main effect of ego relevance, interactions between this factor and both amount of help given and social proximity of the helper were reported. Help from a friend had the effect of lowering self reported scores of personal self-esteem and well-being, in the ego-relevant condition versus the non ego-relevant condition, but only when help was given twice. This interaction was not observed when the altruist was a stranger. While ego-relevance as defined in this study may have a wide range of connotations having little to do with reciprocity and guilt, one aspect of this factor is an implication that reciprocity will be difficult or impossible. If the altruist needs to help the subject because the subject is intellectually inadequate to the task, it is unlikely that the subject will be able to repay the altruist in kind, and this may play at least a partial role in his affective dissonance. If this is the case, one would anticipate that the effect would be enhanced if the altruist is a friend, since friendship constitutes a long-term reciprocal alliance. One would also expect the situation to be exacerbated by repeated instances of helping since this makes the unpayable debt even greater.

Hypocrisy and Spotting Hypocrites. Doth natural selection make occasional hypocrites of us all? The advantage to an organism's fitness of successfully cheating

a system of reciprocal altruism is well demonstrated by Eibl-Eibesfeldt's false cleaner fish. Entire species have evolved due in no small part to their capacity for mimicking traits valued by reciprocal altruists. Among human reciprocal altruists these traits include, the readiness to make friends (new reciprocal alliances), a high degree of sympathy and empathy, gratitude toward one who has helped you, guilt when the reciprocal account is balanced too far in your favor, and moralistic aggression when the balance tips too far the other way. Anyone who has ever been involved in direct sales knows that any good trainer of canvassers will stress the importance of all of these in making a sale, and television advertisers certainly demonstrate their awareness of what motivates people to buy. Of course, purchasing goods is not considered to be altruistic however similar the essential features of a good salesman and a good reciprocal partner may be. The author is unaware of any efforts on the part of social scientists to look at the phenomenon of hypocrisy (and sensitivity to hypocrisy) within the framework of a controlled, mutual helping situation. This seems an incredible oversight given the fact that so many people seem to tacitly accept the possibility. That this is so is evidenced by the importance of this theme in dramatic literature, and by the fact that so many researchers bring up the point so

"matter-of-factly", offering no real empirical evidence.

Take the following quote from Barash (1979), as an example:

A system of this sort is vulnerable, as any good con man knows. Why not take the altruism from another, then refuse to pay it back? ... Of course, the evolutionary process can be as calculating as the cheater, maybe more so. If selfish individuals are cheating in a reciprocal system, selection would favor those altruists who could discriminate true reciprocators from those who had cheated last time around. It could become a never-ending spiral: greater care by would-be reciprocators selects for greater slyness on the part of cheaters, which in turn selects for greater discrimination by the altruists, and so on. Where does it all lead? Just look around. (p. 159).

Barash seems to feel that Trivers' notion that we have evolved both the capacity to dupe others into accepting us as altruists and the capacity to spot such hypocrisy on others as self evident. The present writer, while inclined to agree that these hypotheses are well-supported anecdotally, would like to see a more scientific assessment of them done. Here is yet another opportunity for psychologists to contribute to the responsible testing of Trivers' theory.

Developmental Plasticity. The last of Trivers' predictions outlined here is particularly relevant to the parental role in the molding of the altruistic personality. Trivers suggests that the unstable nature of the human reciprocal system, and the vulnerability of our more important and complex social traits to learning influences combine to enhance individual differences in human

altruistic behavior. One of Trivers' predictions regarding the interaction of offspring developmental plasticity and parental influence is that parents manipulate their offspring to behave altruistically toward kin. This forms the basis of another of Trivers' theories which is reviewed in a later section. The important point here is that Trivers believes that parents may also influence their children to be selfish in some situations where the rules of reciprocity dictate that altruism is called for, but where cheating is a valid option (insofar as it enhances individual fitness of the offspring or its kin). The presence of individual differences in human altruistic behavior established by the research of Rushton et al. (1981), and Johnson (1989) is certainly consistent with this notion, and the influence of parents on these individual differences in altruism is an area that has been well covered in psychology. Social reinforcement of altruistic behavior has been demonstrated to be effective in influencing prosocial behavior in children if it comes from an individual with whom they have a warm and admiring relationship (e.g., Slaby & Crowley, 1977; Yarrow, Scott, & Waxler, 1973). In general, parents would be expected to fit this bill quite nicely.

The author is not aware of any research bearing directly on the issue of direct tuition of selective or conditional altruism of the sort Trivers predicts, but

studies by Rice & Grusec (1975), and Rushton (1975) found that children who observed a selfish model were less generous than those who observed a charitable model even when tested months after these behaviors were modelled. Further, data from the research of Bryan and his associates suggests that children are more attentive to a model's prosocial behavior patterns than to his or her efforts at direct tuition of altruistic behavior (Bryan & Schwartz, 1971; Bryan & Walbek, 1970). In these studies, elementary school children were exposed to models who behaved either charitably or selfishly while extolling the virtues of charity to the children. When the child-subjects were later given the opportunity to donate some of their own resources to charity, the size of their donations was influenced by the model's behavior, but not by his preaching. These findings suggest that, parental preaching notwithstanding, children are likely to pick up on the true rules of the reciprocity game by observing their parents' playing of it. Much more research on this important topic is needed.

Altruism and the Family

The central contention behind the present study is that parents play an important role in the construction of the altruistic personality. Part of this role surely involves the passing on of genetic predispositions which

encourage altruistic behavior, but the greater part of the parent's role in promoting the altruistic personality is the socialization of altruism via direct tuition, selective reinforcement, and modeling of altruistic behaviors. Whether or not we accept Trivers' model of an unconscious inclusive fitness agenda, parents do teach altruistic values and behaviors to their children. It is primarily from our parents that we learn the standards, skills, motives, attitudes and behaviors that are regarded as desirable and appropriate in our natal culture. Cross-cultural research on the altruistic personality by Johnson et al. (1989), and on moral reasoning and altruism by Ma (1985a, 1985b) suggest that altruism is a behavior that is considered desirable and appropriate in many cultures. Research on parental socialization of altruism has focused on two sources of parent influence: Modelling of altruistic behavior, and child-rearing practices. These cultural aspects of parent-offspring altruism are reviewed next.

Modelling and Altruism

Modelling is of particular interest to the present study, since a modelling paradigm predicts a positive correlation between parent and child altruism scores. It is conceivable (albeit unlikely) that a thoroughly selfish individual may shape his or her offspring to behave

altruistically, but a parent must truly be altruistic to model such behavior consistently. Some of the literature on modelling was reviewed in the above section on developmental plasticity under the theory of reciprocal altruism. The following paragraphs present yet more evidence for a parental modelling influence on the altruistic personality.

David Rosenhan (1970) suggested a connection between altruistic individuals and parental altruism. Rosenhan distinguishes between normative altruism (altruism which is motivated by a desire to conform to social norms, such as the norm of reciprocity or the norm of social responsibility) and autonomous altruism (motivated by an intrinsic desire to help others). He studied civil rights "freedom riders" during the 1960's and divided them into two groups based upon this distinction. Fully committed civil rights activists, who had made substantial changes in their lifestyle in order to pursue their ideals, fell into the autonomous category. In contrast, partially committed individuals were those who participated in a single freedom ride and subsequently continued on with their educational and career plans. This latter group was assumed to be normatively motivated. Interviews with these two groups indicated that members of the fully committed group were more likely to have parents who themselves had a past history of activism, while the partially committed subjects tended to report that their parents preached prosocial

values more consistently than they practiced them. Further, while the causes taken up by fully committed activists and their parents were often quite dissimilar, they tended to reflect a common left-liberal sociopolitical ideology (e.g., fighting alongside the anti-Facists in the Spanish Civil War). This would seem to provide further support for the notion of a modelling influence on altruism.

Rosenhan's fully committed activists were also more likely than their partially committed counterparts to report having enjoyed a particularly warm relationship with at least one parent. As was mentioned above, research on parental influences on childrens' prosocial suggests that warmth and approachability constitute an important dimension of a potential model (e.g., Bandura, 1977; Grusec, & Abramovitch, 1982; Hoffman, 1960, 1963; Rushton, 1980; Yarrow, Scott, & Waxler, 1973).

Rosenhan's profile of autonomous altruists among American civil rights workers is very similar to one revealed by London (1970) in his sample of 27 Christians who aided Jews during the Nazi occupation of Europe. His sample of altruists also reported a warm relationship with a parent, and that parent tended to hold both an "altruistic" occupation (e.g., minister, social worker, etc.), and strong moral convictions.

These studies by Rosenhan and London suggest a modelling effect in cases of extraordinary altruism. However, volunteering to put one's safety and security on the line to help an unpopular group comes much closer to the biological than to the standard psychological definition of altruism. An early study by Rutherford and Mussen (1969) looks at the modelling of a more modest sort of altruism between father and son. These authors set out to test the hypothesis that boys' generosity would be related to their perception of their fathers as warm, nurturing, and altruistic toward them. They obtained a "generosity score" for each member of a sample of sixty-three middle-class four-year-old boys by observing how many candies they would volunteer to give away to a friend. Fourteen boys gave no candies away and were placed in a "non-generous" group. Another seventeen boys gave away a large proportion of their candies and were placed in the "generous" group. These designations were validated by teacher-ratings. Both groups of children were then tested using a semi-structured protective measure involving doll-play situations. An example of one of these scenarios involves a boy who wakes up in the middle of the night from a nightmare. The extent of the nurturing behavior attributed to the father doll in this situation is taken as a measure of the child's perception of his own father's nurturing. Rutherford and Mussen found that the mean nurturance scores of fathers on

the protective test was significantly higher for those whose sons were coded into the generous group than for those whose boys were in the non-generous group. Further, of only six boys who reported active, physical comforting of the boy doll by the father doll, all six were in the generous group.

Aside from the studies outlined above, little research has been conducted on parental modelling altruism per se. However, a good deal of research data on the general topic of modelling and altruism exists. An early study by Rosenhan and White (1967) found that children who observed a model donate half of her winnings from a game she was playing to a charity, subsequently donated more of their own winnings from the game than children not exposed to a donating model. Rushton (1975) demonstrated that the effects of observing a generous model last well beyond the initial experience. In an eight-week follow-up experiment, children donated anonymously not only to recipients to whom they had seen the model donate, but also to a new class of recipients.

An interesting study by Hay and Murray (1982) suggests that models not only teach the value of giving, but also the dynamics of reciprocity to children. These researchers observed four groups of 12-month-old infants who had observed an adult either: (1) model giving by offering the baby objects; (2) model receiving by requesting objects

from the baby; (3) model reciprocal exchange by engaging the baby in a game of give-and-take; or (4) sit and chat with the baby's mother. Simply observing the adult behave in a prosocial fashion (condition 1) was not enough to increase the infants' altruistic behavior. Only the infants who had prior experience giving objects to the experimenter or engaging in a reciprocal exchange with them showed an increase in frequency of sharing with the experimenter on later testing. Further, the babies in the give-and-take condition later generalized their altruism to their mothers. These results have implications for Trivers' theory of reciprocal altruism, since they demonstrate that children as young as one year of age model reciprocal exchange, though they do not seem to model selfless altruism.

Parental Training of Altruism

Much of the research on child-rearing practices and altruism has focused on disciplinary practices which either encourage or inhibit the development of altruism. Martin Hoffman must be credited with initiating this line of research. Hoffman carried out research in a Detroit nursery school and reported on it in two separate papers (Hoffman 1960, 1963). He observed the natural play behavior of twenty-two working-class and middle-class children over three separate half-hour periods and coded

them on two categories of altruism: (1) consideration for others (showing concern for another's feelings); and (2) giving affection (hugging, kissing, and making friendly greetings). He also coded the children on three categories of antisocial behavior: (1) hostility; (2) power-assertiveness; and (3) resisting influence. Hoffman then interviewed the mothers of these children to gain information concerning their disciplinary techniques. These he classified as (1) power-assertive (use of threats and physical force), (2) consequence-oriented ("don't do that because..."), or (3) other-oriented ("don't do that because of the hurt it will cause another"). The results were that parents who used the two inductive reasoning approaches (consequence- or other-oriented), and who were openly affectionate and accepting of their children had children who were rated as highly affectionate toward their peers. The use of the "other-oriented" approach was especially effective. Conversely, parents who used a power-assertive approach raised children who rated high in the anti-social categories of Hoffman's scale. These results suggest that a combination of reasoning and modelling incorporated into child-rearing techniques is a strong source of parental influence on offspring prosocial behavior.

Although warmth and reason will encourage altruistic behavior in children, research also suggests that this

approach must be coupled with a strong, well-defined and enforced set of behavioral boundaries. Diana Baumrind's important work on parenting styles (e.g., Baumrind, 1968) suggests that the "authoritative" parent, who sets firm guidelines and enforces them with a firm inductive-reasoning approach, or even a power-assertive approach, to discipline is most effective at raising prosocial children, and that a lax parenting style is likely to lead to a high level of antisocial behavior from offspring. This observation is supported by that of Zahn-Waxler, Radke-Yarrow, & King (1979) that toddlers whose mothers state forcefully to them that socially responsible behavior is expected of them tend to be rated as more altruistic.

A Fitness-Based Model of Parental Training of Offspring Altruism

The unspoken assumption of psychologists studying parental socialization of altruism is that parents encourage altruistic behavior in their children because altruism is valued by our culture. In other words, learning to behave altruistically is socially adaptive for the child. The research of Johnson et al. (1989) and of Ma (1985a, 1985b) suggest that altruism is valued in quite a wide variety of cultures. The ubiquitous nature of human altruism supports the possibility that altruism is somehow biologically adaptive as well. The theories of kin

selection, and reciprocal altruism suggest two genetic fitness-based mechanisms which may select for altruism among humans and other species. Robert Trivers (1974, 1985) offers a genetic fitness-based explanation for the tendency of parents to encourage altruism in their offspring as well. Trivers hypothesizes that parents are selected to encourage altruism in their young as a means of enhancing their own genetic fitness. Trivers' theory is based on the same arithmetic as Hamilton's theory of kin selection. Since offspring are 50% related to any one of their parents, parents are appropriately selected to invest in the survival and reproductive success of a given offspring. On the other hand, they are also selected to invest in the survival and reproductive success of their other progeny, both realized and potential (i.e., unborn). Given this set of circumstances, there must come a point where the benefit of parental investment (PI) in a given offspring is outstripped by the cost of this investment to inclusive fitness (IF), and at this point PI should fall. That PI often does not fall proportionately to its cost to parental IF can be accounted for by the fact that progeny are themselves selected to maximize their fitness. Offspring are related to their siblings to the same degree that their parents are (50%), but they are perfectly "related" to themselves. So, while offspring have a genetic interest in the well-being of their brothers and

sisters, it is exceeded by their own genetic self-interest. The offspring is thus selected to "undervalue" the cost of PI such that it will reach an optimal cost-benefit balance at a higher level of PI than will its parent. Parental investment can be expressed as a function of time (e.g., time of weaning, fledging, etc.), so one of the important predictions of Trivers' theory is that there should be a bounded period of conflict between parent and offspring over the issue of parental investment as the parent attempts to terminate its contribution and the offspring attempts to prolong that contribution. Note that, since the impetus for this conflict lies in the selection of both parties to maximize their inclusive fitness, the psychoanalytic interpretation that parent-child conflict arises from the innate selfishness of the child is given quite a new twist; the sword of "selfish" instinct may cut both ways.

Trivers' prediction of a period of parent-offspring conflict leads to a further prediction that the arsenal in this conflict will include a good deal of psychological manipulation. This is particularly true on the part of the offspring, since it is at a relatively greater disadvantage physically than psychologically and emotionally. Trivers (1974) suggests that such selection for successful psychological manipulation of parents by offspring can be seen in the natural dynamics of parent-offspring communication.

Neonates signal parents that they are hungry or in danger by crying, and that their needs have been satisfied by tail-wagging, smiling, etc. The existence of an elaborate and effective system of emotional communication is widely accepted by developmental psychologists studying the phenomenon of attachment (e.g., Bowlby, 1969, 1973; Wolff, 1963, 1969; Stern, 1977; Izard, 1982). Such an affective communication system is rife with opportunities for cheating on the part of the offspring. For instance, once it is established that crying will reliably attract adult attention, it can be abused to draw adult attention (or feeding) in excess of what is needed for survival. Alternatively, the offspring might elect to employ a negative reinforcement paradigm, withholding positive signals (e.g., smiling) until demands have been met. Still another strategy for "milking" more PI out of parents might involve older offspring reverting to the use of old signals that were appropriate when it was younger. Such a tactic would be of greatest value to offspring of more highly neotanzed species, where the extreme helplessness of neonates leads to greater selection for parental sensitivity to infant cues. Trivers suggests that the phenomenon of "regression", familiar to psychologists studying the behavior of human children might be explainable under his theory.

Trivers' theory presents a wonderful array of testable hypotheses with intriguing connections to much of the work being done on parent-child interactions within developmental psychology, only a few of which are touched on above. Of particular interest to the present study is Trivers' prediction that parents and offspring should be selected to disagree over the offspring's selfish versus altruistic behavioral tendencies to the extent that these tendencies affect family members. Sibling-sibling altruism provides a convenient example, although similar dynamics hold for other family members. From a cost/benefit standpoint, altruism toward a sibling is only cost-efficient if the benefit to the sibling is twice the cost to the altruist (siblings are 50% related to each other, but are 100% related to themselves). From the parent's standpoint, there is an equal genetic investment in all offspring, so altruism among offspring is favored any time the benefit to the recipient exceeds the cost to the altruist. Given such circumstances, evolution should favor not only kin selection, but parental training to enhance kin selection wherever the cost to the altruist is outweighed by the benefit to the parent in terms of inclusive fitness. Further, the model predicts that some degree of training to behave prosocially toward non-kin is selected for as well, as the relationship between any family member and an unrelated individual may affect the

fitness of all family members with regard to future interactions with that individual. Trivers seems to be suggesting here (as well as in his "reciprocity theory") that evolution selects for something akin to the "golden rule", and that it does so at the level of individual fitness.

Parent-Offspring Conflict and Human Altruism

Trivers' concept of the evolution of human altruism includes an evolutionary explanation for our habit of encouraging altruism in our young, as well as our natural tendency to behave altruistically. According to Trivers (1974), "socialization is a process by which parents attempt to mold the behavior of each offspring in order to increase their own inclusive fitness..." (p.260). Such a definition stands in contrast to the traditional definition of the social scientist, who is accustomed to viewing socialization as a process of enculturation by which parents pass on to their offspring behaviors that are considered appropriate in the child's natal culture. According to Trivers, the enculturating properties of socialization emerged rather as a byproduct the fact that parents (like anyone else) are selected to maximize their own inclusive fitness. This presents a special problem to many in psychology who are accustomed to viewing social learning as an alternative to genetics as an explanatory

model for human behavior rather than as an integral part of the human phenotype. Like any other scientific discipline, psychology is subject to its own peculiar forms of myopia. For much of the history of American psychology, our vision problems have included a certain blindness to biological influences in behavior. Clearly, the most important human behaviors must be learned, and so we have focused on the learning and enculturation process, ignoring the role of biology in mediating these behaviors. Since we have traditionally discounted any notion that biology plays a significant mediating role in human social behavior, it follows that we have not adequately considered the role of biology in the learning process itself. That a good deal of human altruism and prosocial behavior is acquired through parental discipline, modelling, and direct tuition is not presently an area of great controversy within psychology. Nor would one be likely to seriously challenge the notion that the conscious goal of contemporary parents in advanced societies is to enculturate their offspring because this is a good thing for the child and the society. Not even the most rabid proponent of a strong genetic factor in human social behavior would deny parents their due in this regard. In contrast, any suggestion that the tendency of parents to engage in the moral training of their offspring may have evolved at least in part because it serves the parents' inclusive fitness, would likely draw

fire from many within our discipline. Having only recently adjusted to the notion that the learning process may be affected by the biology of the learner, we are woefully unprepared to comprehend the intrusion of biology on the agents of socialization, and on the very process of socialization itself. The research reviewed below suggests that parental socialization for altruism may in fact have roots in genetic evolution, and that the revered institution of social learning itself may be a natural outcome of the evolution of the species.

Perhaps one of the problems that many social scientists have with sociobiological constructs generally, is the extreme nature of the examples sociobiologists draw from the animal literature. It is difficult enough to relate human behavior to that of, say, Hymenoptera when we know that the proximal motivators for our behavior and theirs are so different. The important point to bear in mind in this regard is that, according to sociobiological theory, certain patterns of behavior are common in the animal kingdom because they are biologically adaptive. How they are motivated proximally is of no importance to evolutionary theory. Be that as it may, drawing conclusions about human behavior by observing behavior in animals is not facilitated when extreme cases are cited, and sociobiologists are fond of citing extreme cases. The area of parental manipulation and parent-offspring conflict

is no exception. Possibly the most extreme example comes again from the Hymenoptera which lay "trophic" eggs: eggs whose sole function is to serve as food for what otherwise would ultimately be siblings. Surely, human manipulation for offspring altruism would not take such an extreme form. On the other hand, Alexander (1974) reports that, in times of food shortage, members of our species have been known to feed their youngest child to their older children. This practice certainly sacrifices the individual fitness of the youngest child, while benefiting the inclusive fitness of the parents whose other offspring will now stand a better chance of successfully reproducing. The polynesian practice of infanticide may represent another instance of extreme parental manipulation for offspring "altruism" among humans. No less an expert than Marshall Sahlins himself points out that this practice among Tahitian and Hawaiian chiefs can only be explained in terms of the social and reproductive benefits reaped by the siblings of the sacrificed child (Sahlins, 1976). Mercifully, infanticide and human trophism are uncommon, and the latter, at least, seems to be a response to extreme deprivation. One must still give some consideration to the fact that such things happens at all in our species, and that they happen in a non-random fashion which clearly benefits the parent-/manipulators' inclusive fitness (i.e., the sacrifice of

the youngest offspring in whom the least investment has been made).

On a lighter note, the psychological literature on child-social development teems with examples that support Trivers' theory. According to Trivers (1985) parent socialization of offspring altruism should include the following features: 1) It should take place in what he refers to as an "arena of conflict" (which is to say that parental and child definitions of acceptable levels of offspring altruism are going to be in conflict); 2) It should concern future behavior of the offspring as well as its present behavior; and 3) It should involve a measure of deceit on the part of all family members as everyone attempts to maximize his or her own genetic fitness. Evidence for each of these predictions will be presented separately below.

Socialization Within the "Arena of Conflict". Trivers theory implies that parents will expect a certain level of altruism from their offspring before the offspring is prepared to offer it. As a consequence, there should ensue a period of struggle in which the parent attempts to alter some of the natural personality characteristics of the child, by installing in the child's mind a set of scripts for prosocial behavior (i.e., a "conscience"). This conscience can be viewed as an internal representation of the parents view of what are the appropriate social

behaviors for the child (Hetherington, and Parke, 1986). Research from developmental psychology suggest that the internalization of these parental scripts takes place the ages of three and six or seven years (e.g., Piaget, 1932; Freud, 1935; Kohlberg, 1969). Once internalized, this parental script will remain in conflict with the child's own innate tendency to maximize his or her own individual fitness. Thus, there should ensue a period of internal conflict whereby the child's innate programming, and the parentally acquired scripts "square off". A satisfactory resolution of such a conflict would require its mediation by a cognitive "third party" who could assess the two competing agendas and arrive at a compromise which maximizes the child's individual fitness given the particular set of circumstances into which it has been thrust. Students of psychoanalysis will immediately recognize the elements within this triune personality system as Freud's id, ego, and superego. This similarity between Freud's system of morality-born-of-conflict and that of Trivers is certainly not lost on the latter, who proposes that the energizing force behind the id of child and parent alike is the instinctive drive in each to maximize his or her respective individual fitness. Superego is, in a sense, viewed as a proxy for the id of the parent in the mind of the offspring.

While Trivers seems to consider it quite a coup that his evolutionary conception of moral training dovetails so neatly with that of Freud, contemporary psychologists know that Freud's model for the acquisition of conscience is not without serious problems. Freud's original proposal of an oedipal basis for moral development has been largely abandoned as untenable, even within psychoanalysis. However, the concept of two motivational aspects of personality in dynamic conflict, mediated by a third, has held up quite well. In addition to Trivers, other non-psychoanalysts have found evidence of these Freudian personality dimensions. For example, the factor analytic research of Raymond Cattell has revealed two distinct factors which bear enough similarity to the constructs of ego and superego that Cattell has adopted those terms for these factors (e.g., Cattell, Eber, & Tasuouka; 1970).

Even where Freudian psychodynamic terminology is not embraced, the theme of a period of conflict between the natural inclinations of the child and the internalized rules of parents is evident. In the cognitive-developmental domain, Piaget (1932) describes a period of "heteronomous" or "other-centered" morality in which the child has internalized the rules of her parents, but has not yet made them her own. Prosocial behavior at this stage is said to be motivated by fear of immanent justice and expiatory punishment by others. The notion that

prosocial behavior emanates from one's own self does not emerge until the "autonomous" stage which corresponds with the onset of formal operations. According to Trivers this observed "internalization" of adult standards occurs as an individual moves on to an age where his or her individual fitness is served by the same sorts of behaviors as his or her parents. In other words, as we approach the age of reproductive viability, we begin to see the importance of prosocial behavior; particularly in children.

Finally, even the social learning theorists describe a scenario which would be expected to lead to periods of external and internal conflict between the parental and child agendas. Bandura (1977) describes moral behavior as a class of socially acceptable responses that have become self-reinforcing because they allow us to experience positive affect or avoid negative affect. These behaviors acquire their reinforcing properties because of contingencies which are artificially manipulated by the parents. That these must compete with primary reinforcers should be evident to anyone who has ever put an instrumentally conditioned subject on extinction. One could make the case that parents are manipulating contingencies in the child's environment such that the child is deceived into following a course of action which is counter to its own self interest. Just as Trivers predicts, this involves a period of conflict between the new, parentally imposed

motivational structure and the one that the child follows innately.

Concern over future offspring behavior. If the evolutionary roots of parental manipulation for offspring altruism involve maximization of the parents' inclusive fitness, then the behavior of the offspring once it becomes reproductively viable should be a matter of some concern to the parent. Choosing to marry or not, choice of a particular mate, number of children, post-marital residence, etc. are all issues which bear directly on the inclusive fitness of our parents, and social institutions and ceremonies surrounding these exist in many cultures. Some of the issues surrounding the issue of post-marital residence have already been discussed in relation to kin selection. The fact that some societies find it necessary to dictate either patrilocal or matrilocal residence speaks to the pan-specific importance of protecting parental investment in offspring. Some degree of parental manipulation of mate choice may be another species-universal phenomenon. In our own culture parental input concerning adolescent dating behavior is legendary, but other societies have provisions for more formal parent input in the area of mate selection. According to Trivers, parentally arranged marriages tend either to: 1) be endogamous, thereby increasing the likelihood that the offspring's own family will continue to display altruism

toward the parental family, or 2) have the effect of cementing an alliance between two families which have the potential of providing reciprocal benefits to one another. In traditional Chinese society, the formation of inter-family alliances by parentally arranged marriages was of particular importance, especially among the upper classes. Wolf (1966) reports on the Chinese custom of "Shim-pua" marriage, in which wealthy families actually adopted prospective daughters-in-law while they were still young girls and raised them alongside their future husbands. Thus, inter-family alliances could be cemented before the offspring were even reproductively viable. An unfortunate drawback of the Shim-pua arrangement is that raising prospective marriage couples as "siblings" seems to trigger a natural human disinclination to be sexually stimulated by close relatives (see Barash, 1979 for review). As a consequence these arranged marriages were seldom satisfactory to the married couple. Being sexually turned off by one's mate is certainly detrimental to one's individual fitness, and thus we have a clear case of parental manipulation resulting in true biological altruism in the offspring.

The fact that the institution of Shim-pua survived for as long as it did, despite its negative effect on both individual fitness and individual happiness, is testimony to the importance of establishing kinship ties in Chinese

society. The European and Hawaiian upper classes were also interested in cementing family alliances through their offspring, and the sacrifices they were willing to impose on the genetic fitness of their children were even more extreme. While many Chinese marriage couples were raised as brother and sister, actual genetic inbreeding was actively discouraged by Chinese society. Freedman (1979) points out that traditional Chinese custom requires that marriage take place only between two individuals with a different patronymic (no small feat in China). Conversely, European and Hawaiian royalty actively encouraged endogamy, a practice known to increase the probability of certain diseases. Again, parental manipulation of offspring reproductive behavior is seen to increase the fitness of the parent (by insuring peace with a potential adversary, etc.) while proving detrimental to the fitness of individual offspring.

Finally, there may be some cases in which parents will manipulate one of their offspring not to reproduce at all. Forgoing procreation need not be detrimental to the genetic fitness of an individual, provided that the cost in individual fitness is outweighed by the benefit in increased inclusive fitness via relatives. For the cost-benefit ratio to work out in favor of refraining from reproducing in order to help siblings, the cost of altruism must be outweighed by its benefit by a factor of greater

than two. From the point of view of the parents' fitness, however, any increase in genetic fitness of siblings over the cost to the altruist is beneficial. Trivers (1974) stops short of stating that this situation is implicated in the etiology of human homosexuality although he does raise this rather dubious possibility. Regardless of whether or not parents unconsciously manipulate their childrens' sexual inclination, it is certainly true that many cultures have a provision for celibacy. For example, in many catholic families having a priest in the family is considered a point of pride, particularly for the parents. In earlier times, sending a child off to a monastery or convent was a viable means of reducing the number of mouths that parents needed to feed, and thus can be understood as manipulating an offspring into a nonreproductive lifestyle in order to enhance the inclusive fitness of the parents.

Deception Within the Family. Some of the strongest support for Trivers' theory of parent-offspring conflict concerns the issue of deception. A major facet of parental deception has already been mentioned. One of the principal means of socializing young children is by managing reinforcement contingencies. When parents create an environment in which a child is reinforced for behaviors which are not ordinarily reinforcing to her, and has reinforcement withheld (or punishment applied) after engaging in behaviors which should bring reinforcement,

they are deceiving the child in a very real sense. When parents consciously alter their own behavior patterns or those of the child's siblings in order to model "appropriate" behavior, they are again engaging in deceit. However, deception is not the sole province of the parent. An important aspect of Trivers' conceptualization of parent-child conflict is that deceit is a two-way proposition, with the offspring making a significant contribution. In fact, psychological manipulation is ultimately of greatest importance to the child, whose inferior size and strength leave him no other viable option through which to gain an equal footing with his parents. As Trivers (1974) eloquently explains:

An offspring cannot fling its mother to the ground at will and nurse. Throughout the period of parental investment the offspring competes at a disadvantage... Given this competitive disadvantage the offspring is expected to employ psychological rather than physical tactics... It should attempt to induce more investment than the parent wishes to give. (p. 257).

To put it another way, the sword of deceit cuts both ways, with both parent and child actively seeking to encourage altruism in each other.

The psychological literature from the closely related areas of infant emotional development and parent-child attachment provide a wealth of support for the notion that children indeed attempt to maximize parental investment. As Trivers points out, an offspring generally has a better

knowledge of its real needs than does its parent, and so natural selection should favor some mechanism through which the infant can communicate its needs to the parent. The first common medium of communication between the nonverbal infant and its language-dependent caregiver is an affective one (Ainsworth, 1972; Bowlby, 1969). It was Bowlby (1969) who first suggested that neonates instinctively perform certain emotional behaviors which signal the caregiver that it is in need or that its needs have been met. For example, crying indicates that the infant needs some sort of attention, and a smile indicates that it is satisfied.

The efficacy of this affective infant-caregiver communication system has been well documented. Carol Izard has studied emotional expression in infants by videotaping babies' responses to various stimulus events and then asking adults to rate the facial expressions of these infants (Izard, 1982). This research demonstrated that adult subjects are able to accurately and reliably assess an infant's emotional state by observing its facial expression. Earlier, Peter Wolff (1969) identified three distinct, information carrying cries that infants emit signifying pain, hunger, or anger. He assessed the ability of mothers to distinguish among these three types of cries by playing tape recordings of them while their babies were in the next room, ostensibly being observed by Wolff. Even new mothers responded much more quickly to pain cries than

to hunger or anger cries. More recently, Wiesenfeld, Malatesta, & DeLoach (1981) demonstrated that mothers can reliably distinguish between pain and anger cries only in their own children, suggesting that caregivers who have had experience with their own infant's particular attempts at deception develop a degree of immunity to being duped.

For an affective parent-child communication system to be viable (and open to "abuse" by infants) infants must be able to determine the emotional state of the caregiver. Research indeed suggests that just as parents can read the emotional cues of their offspring, infants can assess emotional states in others. The previously cited research of Martin Hoffman and his colleagues on infant recognition of another infant's distress cry is relevant again here. There is also very good evidence that infants tune in to their caregivers very early on. It has been observed that parents (particularly mothers) commonly speak to their babies in a high-pitched "happy voice" during the first year of the infants life (Fernald & Simon, 1984). By as early as 4- to 6-weeks, infants can discriminate their mothers' voices from those of female strangers when Mom speaks in her "happy voice" much more reliably than when she speaks in an adult monotone (Mehler, Bertoncini, Barriere, & Jassik-Gerchenfeld, 1978). Between 7- and 9-months of age (ages which correspond to the early phases of attachment) infants' ability to distinguish emotions such

as happiness, fear, and anger from adult facial expression undergoes dramatic improvement (Caron, Caron, & Myers, 1985; Nelson & Dolgin, 1985). The abilities of both infant and caregiver to send and receive emotional signals comes together in a powerful system of mutual behavioral regulation which is critical to the attachment process and to the survival of the helpless human infant. A graphic example of the power and precision of this medium of communication can be seen in the phenomenon of interactional synchrony (Stern, 1977). Stern and others have observed mothers interacting with their infants in a synchronized, coordinated fashion which Stern likens to a dance, but which might be more accurately described as a wordless conversation. Mother and infant respond to each others movements and facial expressions in a synchronized, predictable, and meaningful fashion. The basic capacity for interactional synchrony may well be innate. Stern reports on elaborate "dances" between a mother and her three-month-old infant, and Peery (1980) reports that one-day-old infants are already synchronizing their head movements with those of adults.

Trivers notes that a system of communication as effective as the one described here is open to abuse once the offspring becomes aware of its efficacy. An infant will soon learn that its caregivers are responding not directly its needs, but to the emotional distress calls it

emits. So, for example, a cry for food can be sent out when in fact there is no real need for food. In his study of infant crying, Wolff occasionally observed a fourth type of cry which served no apparent function, and which Wolff referred to appropriately as a "fake cry". He suggested that these fake cries served one or both of two possible functions: 1) self-stimulation (i.e., the infant is entertaining him- herself), or 2) capturing the attention of the adult for its own sake. In the latter case the infant can be seen as attempting to "monopolize" the caretaker, keeping him/her close at hand even where there is no particular immediate need. This would have the result of maximizing parental investment in the crier, possibly at the expense of the fitness of parents and siblings. The "angry cry" may serve a similar function with regard to the psychological manipulation of parents. Recall that the 1981 study by Wiesenfeld, et al. found that distinguishing angry cries from pain cries was difficult unless the crier was one's own offspring, presenting the possibility that parents may adjust to this type of deception with experience. If this is in fact the case, it is perfectly in keeping with Trivers' (1971, 1985) prediction.

As children mature, the angry cry evolves into a more intense form of activity widely known among parents as the temper tantrum. Trivers suggests that the temper tantrum

is another behavior pattern that may have evolved in order to maximize parental investment. A child in the throes of a temper tantrum behaves violently and irrationally such that a naive observer might easily gain the mistaken impression that the child was in real physical anguish. Perhaps this is precisely the impression that such behavior is supposed to convey. Trivers (1985) draws on the words of naturalist George Schaller who describes a "temper tantrum" in a pelican chick:

Young, ten or more days old, often begged vigorously for food. Usually a young pelican sat very upright in front of its parent with neck stretched high and wings beating, until it was admitted to the pouch. Sometimes, however, a young bird ran to an adult, threw itself on the ground, and beat its wings wildly, all the while swinging its head from side to side. Occasionally the young lay on its side, beat one wing, suddenly jumped up, ran at and pecked several young in the vicinity, driving them away, only to continue begging. It also grabbed, shook, and bit its own wing with the bill as it turned around and around, growling all the time. In the words of Chapman (1908) the young "acts like a bird demented." (pp. 156-157).

Parents of toddlers will recognize more than a few of these behaviors and strategies. Threatening to hurt others, threatening to hurt oneself, and "acting like a bird demented" are all facets of human temper tantrums, and all too often they are successful in drawing adult attention and holding it for an extended period of time. That so many of the "parenting manuals" at the local bookstore exhort parents to ignore tantrum behavior testifies as to

the fact the effectiveness of these techniques. Trivers points out that these strategies are exhibited by children who often have had no opportunity to model such behavior in others, suggesting that we may be selected to engage in such behaviors as young children.

Yet another manipulative strategy that Trivers believes children may be selected for is the well known phenomenon of age regression. He points out that in species such as our own, where offspring are more vulnerable the younger they are, parents should be selected to respond more positively to the distress signals of younger offspring. Such a notion is consistent with the research of ethological theorists such as Bowlby (1969). This being the case, a logical strategy for an older child who wishes to maximize parental investment is to mimic the distress signals of a younger child. Further, these sorts of behaviors should be associated with threats to the child's accustomed level of parental investment such as divorce, changes in parental work demands, or the birth of a sibling. Again, Trivers sociobiological model of parent-child conflict is consistent with the observations of child researchers in this regard.

One final area where Trivers' theory is remarkably consistent with the psychological literature concerns the phenomena of attachment and separation. In his 1974 article on parent-offspring conflict he states that, in

order to be viable, the system of child-manipulation of the parental altruism must be sensitive to vicissitudes in parental ability to respond altruistically. In other words, there must be some means of distinguishing parental refusal to help and parental inability to help in a given circumstance. Trivers suggests that offspring will predict future parental investment based upon the existing social relationship between parent and child. Put another way, the quality of the parent-child attachment governs the child's expectations for future parental investment, thus regulating his or her behavior toward the attachment figure. Trivers cites as evidence a study by Hinde and his associates with Rhesus macaques. Infant Rhesus responded differently to separation from mother depending both upon the quality of the mother-child relationship, and the reason for the separation. Infant Macaques who had experienced maternal rejection prior to separation were more distressed by the event than more securely attached monkeys. Further, infants who were removed from their mothers by investigators were less distressed and more forgiving than infants whose mothers had been surreptitiously spirited away.

Hinde's work with Rhesus is impressive in terms of its support for Trivers' predictions. Yet more impressive in this regard is the research of Mary Ainsworth and her associates on quality of human infant-caregiver attachments

(e.g., Ainsworth, 1973, 1979; Ainsworth, Blehar, Waters, & Wall, 1978). This line of research, utilizing one-year-olds and their mothers, identified three distinct profiles of mother-infant attachment. These correlate strongly with three profiles of maternal behavior, and with three profiles of infant response to both separation and the presence of a stranger. The majority (70%) of Ainsworth's subjects were securely attached to their caregivers. These infants protested separation from their mothers, were openly approachful toward her upon reunion, and were fearful of strangers when separated from the mother, while less so when in her presence. Insecurely attached infants were of two varieties. The "anxious and ambivalent" infants showed frequent and intense distress regardless of whether or not mother was present, and seemed to be uninterested in maintaining proximity to her and unexcited about reunion with her following a period of separation. Strangers were equally frightening to these children whether Mom was present or not. Mothers of anxious and ambivalent infants were rated as insensitive and awkward in their interactions with their babies, and it appears that their inconsistent behavior led infants to place little faith in their altruistic tendencies. Finally, a third group of "anxious and avoidant" infants was observed. These babies were by no means ambivalent about mother; they were openly rejecting. Upon reunion, they avoided Mom

and ignored her bids for interaction. The mothers of these babies were observed to be quite rejecting in their own right. They were insensitive to their offspring's signals, seldom affectionate, and often irritable. The overall impression one gets of these mothers is that they are much more likely to demand altruism than to offer it, and they are appropriately rejected by their infants.

The results of Ainsworth's research fit well with a model based on the notion that infants are selected to maximize their individual fitness. Infants who have a sensitive caregiver who reliably and consistently gives more altruism than she demands should be expected to invest energy in maintaining close proximity to that caretaker, to seek her out in times of stress or danger (as when faced with a strange adult), and to be visibly upset when deprived of her company. This is precisely what Ainsworth observed in her securely attached subjects. Infants whose mothers are less dependable should be expected to experience a high level of anxiety most of the time, since they are in need of adult altruism for their survival and their caregiver is an unreliable source. Further, they should be ambivalent about seeking out their caregiver, since she is not seen as particularly supportive of the child's individual fitness needs. Finally, infants whose mothers threaten their individual fitness, demanding more altruism

than they give, should be avoided. It appears that they are.

Trivers' biological perspective on emotional development and social learning within the family have implications which go far beyond the area of prosocial behavior. In this model of parent-offspring relations we have perhaps the greatest potential for a common ground between sociobiology and psychology, and much of the groundwork has already been laid by the ethological and psychoanalytic attachment theorists. That so much of the data collected under a social-learning/enculturation model fits so well with the predictions of an evolutionary-fitness model suggests that we have not two theories in opposition to one another, but rather two views of the same phenomenon. Dispassionate research may reveal that they are actually quite compatible. For the purpose of the present research, it is sufficient to know that both the psychological and the sociobiological models recognize the importance of the parent-offspring relationship to the altruistic personality. They provide both a sound basis for justifying a family study of altruism, and a set of hypotheses which may be tested by such an approach.

Rationale for the Family Study

A central assumption of the present research is that individual differences in altruism exist which have both

social-cultural and biological underpinnings. The literature reviewed above provides a wealth of evidence in support of this notion. This literature also reveals that very little has been done to date to provide for measurement of individual differences in altruism, whatever the sources of these differences may be. Rushton and his colleagues gave us an initial push back into an area too long neglected by introducing the first self-report instrument for altruism, and by using this measure to gather valuable data on twin concordances and on psychological correlates of altruism. Rushton's foundation was built upon by Johnson and his colleagues, who added the valuable dimension of a cross-cultural study of the subject. The recent research of Ma on moral reasoning and altruism in Chinese and Western subjects has also contributed in this area of cultural influences on altruistic behavior. A logical next step would seem to be to trace altruism across generations within the family unit. The family is the sole medium for transfer of genetic material across time, as well as the principal source of socialization and enculturation in any society. If there are indeed individual differences in altruistic behavior, as there seem to be, one would anticipate that family members would display similar profiles to one another.

Hypotheses

The hypotheses guiding the present research fall under three over-arching goals. The first and most important of these is to find evidence for the transmission of the altruistic personality across generations within the family. A second goal concerns the assessment of differences in absolute scores on the altruism measures between generations. The final goal of the family study is to further validate the self-report method of assessing individual differences in altruism by replicating the results of the cross-cultural study of Johnson et al., and by manipulating the third measure of altruism (i.e., changing "importance of helping" to "cost of helping"). Out of these three research goals, the following seven hypotheses are generated:

1. The principal hypothesis tested here is that the altruistic personality is transmitted across generations within a family. This hypothesis predicts that the three measures of altruism (giving help, receiving help, and rating the cost of helping) will show significant, positive correlations between parents and offspring. An equally important prediction arising out of this hypothesis is that such positive and significant correlations will not be observed when the means of college-age subjects are correlated with those of unrelated members of the parents' cohort.

2. A second hypothesis investigated in the present study states that the transmission of altruism is accompanied by the transmission of related personality characteristics. The cross-cultural assessment of altruism by Johnson et al. found significant positive correlations between helping and extraversion, guilt, and intrinsic religiosity, and negative correlations between helping and shame. It is predicted that positive and significant parent-offspring correlations will be found among these traits.

3. Hypothesis three states that the new rate-cost measure will tap into a different dimension of altruism than the original rate-importance measure. Specifically, it is hypothesized that the original measure confounded the cost-to-self and benefit-to-other aspects of helping. Eliminating the benefit-to-other aspect should moderate the high positive correlations found between the third measure of altruism and the other two in the Johnson et al. study. It is predicted that the relationship between rated-cost and giving and receiving help will be negative in direction. It is further predicted that this difference will be greater for some groups of subjects than for others. For example, the presence of items involving physical risk or exertion should increase the negative give/cost ratio for female subjects, as cost score will rise and give scores fall relative to those of male

subjects. A similar effect is expected for younger subjects, as resources (such as money) are more precious for college students than for full-time working persons. A final prediction related to the alteration of the importance of helping measure is that the focus on cost-to-self vs benefit-to-other will eliminate the positive correlation between the third measure of altruism and guilt, found by Johnson et al., since guilt focuses attention on social norms (a benefit-to-other focus) and the new measure focuses attention on oneself.

4. A fourth hypothesis is that mean altruism scores for subjects in the two cohorts will differ significantly and predictably. Specifically, older subjects will score higher on the give-help and receive-help measures than younger subjects, and lower than younger subjects on the rate-cost measure. This hypothesis is based primarily on the assumption that older subjects are likely to have had more experiences with a wider variety of situations than college-age subjects. Since the altruism scale was designed to cover a fairly wide range of situations (e.g., altruism in the work-place), they should have an advantage in this area. The relatively wide net cast by the 56 items of the altruism scale should also place restrictions on the younger subjects in that a number of items require the sacrifice of money. Again, cash is in fairly short supply among college students. Finally, older subjects in the

present study are, by definition, parents of adult (and presumably reproductively viable) offspring. From a sociobiological perspective this places them in a better position to risk physical harm while preserving their genetic fitness, relative to their childless offspring. A fitness-based model of altruism would predict that younger subjects should rate the cost of helping higher to the degree that it interferes with their reproductive fitness. Obviously, physical risk items should be particularly important, but the relatively greater preoccupation with matters related to reproduction (courting, etc.) may make sacrifices of time, money and status all the more onerous as well.

5. Aside from generational differences, the sex differences found in the Johnson et al. study will replicate here, with the scale favoring male subjects on both the give-help and receive-help dimensions.

6. Despite the anticipated group mean differences stated in the above hypotheses, it is anticipated that the correlations between measures will be similar within each group, and that these will replicate those found by Johnson et al. with the exception that cost of helping will fail to correlate positively with giving and receiving help. As in the earlier study, the greatest single correlation will be between giving and receiving help.

7. A final hypothesis, related to hypothesis 6, is that item-by-item correlations between generations on the three altruism measures will show a similar pattern of responding across these two groups.

III. METHOD

Subjects

Subjects were 118 undergraduates from the University of Hawaii 102 of whom also provided data from each of their parents. Although the male/female ratio ranged from approximately 1:1 for two of the classes sampled to 2:3 for the two least gender-balanced classes, the rate of responding for male students was quite low, thereby limiting parent-offspring comparisons for the most part to those involving female offspring. Of the 102 complete families in the sample, 84 are families with female offspring, while only 18 are families with male offspring. A breakdown of the total sample by sex and by cohort appears in Table 1.

Table 1.
Breakdown of Subjects by Sex and Cohort

Cohort	Males	Females	Cohort Total
Parent's Generation	105	111	216
Offspring Generation	21	97	118
Gender Total	126	208	Total N=334

Measures

The primary data collection instrument was an adaptation of the 56 item self-report altruism scale developed at the Behavioral Biology Laboratory of the University of Hawaii. A single alteration to the original scale was made for the present study. In the original scale, subjects are asked to rate the importance of each behavior as an act of altruism using a four point scale (unimportant, slightly important, moderately important, very important, very important). It was initially assumed that "importance" would be largely a function of the degree of risk and/or sacrifice involved in the act. Results of data gathered thus far with the scale suggest that other considerations play a part in subjects' rating of the importance of a given item, limiting the usefulness of this measure. In light of the apparent lack of precision of the "importance" measure, this aspect of the altruism scale was modified for the present study such that subjects are explicitly asked how costly the behavior is to the actor. As this represents a significant departure from the original, psychometrically tested instrument, the reliability of the new measure was tested using the coefficient alpha formula (Cronbach, 1951). Coefficient alpha estimate for the original rate-importance measure ranged from .91 to .95 over the seven samples in the Johnson et al. (1989) "Cross cultural assessment of altruism". Coefficient alpha

reliability of the rate-cost measure taken on the present sample of N=334 subjects is .98.

The measure of past experience with receiving the various kinds of help was retained for the present study, and the three additional personality measures employed in the Cross-cultural assessment of altruism (the EPQ-R, the DCQ, and the IERO) are again used here. A description of each of these instruments follows.

The EPQ-R consists of 100 empirically derived yes-no items and provides four scale scores: psychoticism, extraversion, neuroticism, and a lie scale. The 30 item DCQ assesses guilt (over failure to fulfill norms of role reciprocity), and shame (or embarrassment over status incongruity). In a cross-cultural study by Johnson, Danko, Huang, Park, Johnson, and Nagoshi (1987), these two factors of sensitivity of conscience consistently predicted scores on different adjustment measures in the EPQ-R. Guilt was unrelated to neuroticism, while negatively correlated with psychoticism. Shame was associated positively with neuroticism and negatively with psychoticism. These relationships held for subjects from both Occidental and Oriental cultures sampled in this study, and replicated across the seven samples in the Johnson, et al. cross cultural assessment of altruism. Finally, the IERO consists of 21 items, 9 measuring intrinsic orientation (orientation toward attainment of a higher level of

morality), and 12 measuring extrinsic orientation (seeking social support or other personal benefits). The IERO was first used introduced by Feagan (1964) who found that the intrinsic religious orientation correlated negatively with ethnic prejudice, while extrinsic religiosity was positively associated with measures of prejudice. Allport and Ross (1967) replicated Feagan's findings but dropped one item from the Feagan scale. It is the original Feagan version of the instrument that is used here.

In addition to the above materials, each test booklet includes a list of the 56 items of the altruism scale and a set of the five categories used in the Johnson et al. (1989) study. Subjects are asked to place each item into one of these categories based upon what they felt was the primary resource being sacrificed by the altruist. Categories are 1) sacrificing time, 2) sacrificing time plus effort, 3) sacrificing money and/or goods, 4) risking physical or psychological harm, and 5) risking loss of status or an opportunity to increase status.

Procedure

Undergraduate subjects were recruited from four developmental psychology classes, a learning and motivation class and a class on the psychology of women. Data were collected over the course of the Fall, 1989 and Spring, 1990 semesters. Survey packages were distributed

containing one booklet for the student subject and one for each of his or her parents. Students were awarded bonus points which could be added to their final score in the course, and the number of bonus points awarded was based upon the number of surveys turned in. One bonus point was offered if the completed student-booklet was turned in, and another if the parents' booklets were also completed and returned. Returned packages were inspected by the author for similarity of handwriting, and two had to be rejected because the parent data had clearly been "forged" by the students.

IV. RESULTS

Family Resemblances

The central hypothesis of the present study states that family resemblances on the three altruism measures will exceed those expected by chance. This hypothesis was tested by generating separate correlation matrices for college-age subjects with their respective parents and those same subjects with unrelated members of the parent cohort. All correlation matrices were generated by SPSS-X using the Pearson correlation formula with a two tailed test of significance. Creating the matrix of correlations between family members was a simple matter, as the raw data were grouped by family identification codes. Results of the Pearson correlation procedure for family members appear in Table 2, and they offer general support for the notion of parent/offspring transmission of altruism. Significant positive correlations were obtained between fathers and daughters on all three measures of altruism, with the strongest association being on the receive-help measure. Mothers' and daughters' scores on the receive-help and rate-cost measures were positive and significant, but their correlation on the give-help measure is very close to zero.

The low number of male offspring limits the utility of correlations between male offspring and parents. One noteworthy result is a very high correlation on the

Table 2.
Correlations Between all Family Members on Three Altruism Measures

	FATHER			MOTHER			DAUGHTER			SON		
	Give	Receive	Cost	Give	Receive	Cost	Give	Receive	Cost	Give	Receive	Cost
F. Give	1.00	.83 ¹	.19	.26 ²	.37 ¹	-.02	.26 ³	.24 ³	-.04	.09	-.06	-.20
F. Receive		1.00	.24 ³	.23 ³	.40 ¹	.01	.27 ³	.31 ²	-.13	.20	.14	-.22
F. Cost			1.00	.17	.21 ³	.41 ¹	-.03	.03	.22 ³	-.03	.18	.49 ³
M. Give				1.00	.79 ¹	.31 ²	.04	.08	.31 ²	-.03	-.23	.04
M. Receive					1.00	.29 ²	.16	.22 ³	.14	.22	.14	.11
M. Cost						1.00	-.20	-.14	.33 ²	-.03	.31	.63 ²
D. Give							1.00	.82 ¹	-.25 ³	*	*	*
D. Receive								1.00	-.18	*	*	*
D. Cost									1.00	*	*	*
S. Give										1.00	.55 ³	-.34
S. Receive											1.00	.32
S. Cost												1.00

1 p < .001; 2 p < .01; 3 p < .05

rate-cost measure between sons and each of the two parents. These correlations reached statistical significance despite the low N of male offspring.

In addition to separate father-offspring and mother-offspring correlations, a midparent score was calculated and correlated with offspring scores. The results of this analysis appear in Table 3. The lack of a relationship between mothers' give-help scores and those of daughters overwhelms the father/daughter correlations resulting an insignificant, albeit positive, relationship between midparent and daughter give-help scores. Midparent-daughter correlations on the receive-help and rate-cost measures are, of course, significant.

Generating a matrix of correlations between college-age subjects and unrelated older subjects was accomplished by rearranging the raw data matrix such that offspring appeared not in their own families but in whatever set of parents was adjacent to them in the matrix. This was accomplished by adding "1" to the value of each offsprings' family identification number. The "odd man out" (a woman, in this instance) was reassigned to the first family in the matrix, which was left childless by the procedure. Pearson correlations were then calculated on these artificial "families" and the results compared to those in Table 2. The resulting correlation matrix is not

Table 3.
Midparent/Offspring Correlations for Altruism Measures

	MIDPARENT			DAUGHTER			SON		
	Give	Receive	Cost	Give	Receive	Cost	Give	Receive	Cost
M. P. Give	1.00	.84 ¹	.23 ³	.20	.21	.17	.04	-.14	-.11
M. P. Receive		1.00	.25 ²	.27 ³	.33 ²	.00	.23	.15	-.08
M. P. Cost			1.00	-.15	-.07	.35 ¹	-.03	.27	.61 ²
D. Give				1.00	.82 ¹	-.25 ³	*	*	*
D. Receive					1.00	-.18	*	*	*
D. Cost						1.00	*	*	*
S. Give							1.00	.55 ³	-.34
S. Receive								1.00	.32
S. Cost									1.00

1 p < .001; 2 p < .01; 3 p < .05

shown here, as there were no significant correlations save one between "fathers'" give-help scores and "daughters'" receive-help scores ($r=+.23$; $p<.05$).

The hypothesis that personality and adjustment measures associated with altruism would yield positive correlations across generations was investigated by correlating measures on the DCQ, the IERO, and the EPQ-R between parents and offspring. The results of the Pearson correlation procedure on the two scales of the DCQ revealed no significant correlations, although all correlations were in a positive direction and the correlation between mothers' and daughters guilt score of ($r=+.22$) very nearly approaches significance at the .05 level. Extrinsic religious orientation showed an identical positive correlation between fathers and daughters, and mothers and daughters ($r=+.25$; $p<.05$ for each). Correlations between parents and offspring on the more theoretically important measure of intrinsic religious orientation were not significant.

The Pearson correlation procedure for EPQ-R measures revealed a number of interesting relationships which appear in Table 4. Of greatest relevance to the present study is the correlation between parent and offspring extraversion scores, since this was the strongest predictor of altruism among the personality factors employed in the

Table 4.
Correlations Between All EPQ-R Scales for All Family Members

	FATHER				MOTHER				DAUGHTER				SON			
	P	E	N	L	P	E	N	L	P	E	N	L	P	E	N	L
F. P.	1.00	.29 ²	.55 ¹	-.03	.59 ¹	.27 ²	.29 ²	.23 ³	.53 ¹	.23 ³	.22 ³	.20	.37	-.06	.56 ³	.27
F. E.		1.00	.20 ³	.05	.24 ³	-.03	.22 ³	.00	.31 ²	.41 ¹	.09	.08	-.13	-.26	-.16	-.06
F. N.			1.00	-.14	.39 ¹	.10	.18	-.02	.29 ²	-.04	.29 ²	.05	.48 ³	-.22	.75 ¹	.23
F. L.				1.00	-.02	-.12	-.06	.09	.21	.20	-.10	.29 ²	-.46	-.18	-.56 ³	-.10
M. P.					1.00	.11	.44	.13	.41 ¹	.23 ³	.15	.16	.48 ³	.17	.22	.11
M. E.						1.00	.06	.14	.05	.13	.06	.24	-.05	.00	-.04	-.03
M. N.							1.00	.00	.29 ²	.17	.11	.08	.15	-.17	.29	-.29
M. L.								1.00	.02	.02	.01	.11	-.28	.43	-.48 ³	-.17
D. P.									1.00	.28 ³	.29 ²	.29 ²	.	.	.	.
D. E.										1.00	-.14	.23 ³	.	.	.	.
D. N.											1.00	-.09	.	.	.	.
D. L.												1.00	.	.	.	.
S. P.													1.00	.06	.54 ³	.27
S. E.														1.00	-.06	.11
S. N.															1.00	.31
S. L.																1.00

¹ p < .001; ² p < .01; ³ p < .05

P = psychoticism scale; E = extroversion scale; N = neuroticism scale; L = lie scale

Johnson et al. study. As Table 4 reveals, the correlation between father and daughter on this factor is quite high ($r=+.41$; $p<.001$), while a more moderate positive relationship exists between mother and daughter ($r=+.23$; $p<.05$). Once again, the small number of male offspring presents a problem with interpretation of their data. It must be pointed out, however, that the relationship between fathers and sons on this important factor is in a negative direction. Other cross-generation correlations exist which deserve mention here. Fathers' and mothers' P scores correlate positively and significantly with daughters' P and E scores. Paternal P scores also correlate positively and significantly with daughters' and sons' N scores, while mothers P scores correlate positively and significantly with sons' P scores. Father/son P scores correlate positively and strongly ($r=+.37$), but do not reach significance in this small sample. Both Maternal and Paternal N scores correlate positively and significantly with daughters P scores, and fathers' N scores are significantly and positively correlated with those of both sons and daughters. Daughters' lie scores correlate positively with both parents' lie scores and the father/daughter correlation is significant.

The mixed results of the analysis of parent/offspring correlations on the predictor variables for altruism (i.e., guilt, shame, intrinsic religiosity, and extraversion) led

to an analysis of possible correlations between parental scores on these predictor variables and offspring altruism scores. Perhaps conscience-sensitive, intrinsically religious and outgoing parents raise altruistic children. Parental DCQ measures did not correlate significantly with any of the offsprings' scores on measures of altruism. Paternal intrinsic religious orientation did correlate positively with both daughters' give-help and daughters' receive-help scores ($r=+.23$; $p<.05$ in each case). Mothers' religious orientation was unrelated to any offspring measures of altruism.

Due to the large number of scales involved in the EPQ-R, Pearson correlations between these scales and the three altruism measures are presented in the form of a table. Table 5 reveals positive and significant correlations between fathers' extraversion scores and daughters' give-help and receive-help scores, and a significant negative correlation between paternal E scores and daughters' rate-cost scores. Once again, the number of males makes any serious inferences from their scores questionable, but it is worthy of note that the direction of the correlations of both give-help and rate-cost scores are reversed when fathers scores are correlated with those of sons vs. daughters. Maternal scores on extraversion are unrelated to any of the offspring altruism measures.

Table 5.
Correlations Between Altruism Measures and EQ-R Scale Scores for All Family Members

	FATHER			MOTHER			DAUGHTER			SON		
	Give	Receive	Cost	Give	Receive	Cost	Give	Receive	Cost	Give	Receive	Cost
F. Psychoticism	.16	.24 ³	.20 ³	-.04	.11	.11	.03	.05	-.11	.08	-.14	-.15
F. Extraversion	.40 ¹	.35 ¹	.17	-.13	.07	-.04	.31 ²	.24 ³	-.31 ²	-.16	.10	.27
F. Neuroticism	.02	.18	.18	.05	.03	.01	-.01	-.05	.03	-.21	-.15	.10
F. Lie	.01	-.07	-.07	-.05	.04	-.08	.12	.14	.00	-.25	-.07	-.04
M. Psychoticism	.09	.22 ³	.14	-.01	.18	.18	.12	.12	-.06	.38	.13	-.18
M. Extraversion	.11	.17	.12	.26 ²	.24 ³	.09	.07	.04	-.04	.24	.14	-.11
M. Neuroticism	.19 ³	.27 ²	.02	-.02	.10	.15	.04	.04	-.15	.30	.38	.03
M. Lie	-.04	-.05	-.03	.04	.01	.01	.04	-.12	-.02	.42	.14	-.27
D. Psychoticism	.17	.24 ³	.21	-.02	.21	.14	.08	.26 ³	-.07	*	*	*
D. Extraversion	.26 ³	.20	-.01	-.06	.15	-.13	.43 ¹	.44 ¹	-.23 ³	*	*	*
D. Neuroticism	.04	.08	.15	.13	.14	-.19	.05	-.02	-.07	*	*	*
D. Lie	-.11	-.05	.14	-.02	.06	.00	.12	.01	.04	*	*	*
S. Psychoticism	.30	.27	-.21	.24	.16	-.26	*	*	*	.21	-.03	-.22
S. Extraversion	-.05	-.10	.31	-.12	-.04	.02	*	*	*	.55 ³	.21	.04
S. Neuroticism	-.18	-.17	-.23	.07	-.07	-.27	*	*	*	.04	-.03	.10
S. Lie	-.14	-.05	-.07	.27	.16	.03	*	*	*	-.18	-.29	.15

1 p < .001; 2 p < .01; 3 p < .05

Gender Comparisons

An important facet of the cross-cultural assessment of altruism concerned the issue of gender and altruism. In four of the seven populations sampled, the altruism scale was found to yield higher mean scores for males than for females in giving and receiving help, while mean scores for rated importance of helping were generally lower for males. In spite of these mean differences, however, the personality correlates of altruism were essentially identical within each sex. The issue of gender and altruism is pursued in the present study.

Separate correlation matrices were obtained for males and females for the purpose of assessing similarities and differences in the correlates of helping between the sexes. The correlations for males and females appear in Table 6 and Table 7 respectively. Comparison of Tables 6 and 7 reveals some important similarities between the two sexes in terms of altruism correlates. The most important predictor of helping for both sexes is past experience with having received help oneself. The next most potent predictor of helping is extraversion, which also correlates strongly with having received help. These data replicate those of the Johnson et al. (1989) study. In contrast to the "importance of helping" measure, cost of helping does not correlate significantly with helping in either direction for either sex. Finally, strong positive correlations

Table 6.
Correlations Between all measures for Male Subjects

	ALTRUISM			Psycho.	EPQ-R			DCQ		IERO	
	Give	Receive	Cost		Extra.	Neuro.	Lie	Guilt	Shame	In. Rel.	Ex. Rel.
Alt. Give	1.00	.82 ¹	.10	.16	.37 ¹	.01	-.01	.23 ²	-.13	.01	.01
Alt. Receive		1.00	.23 ²	.23 ²	.35 ¹	.11	-.09	.14	-.07	-.02	.00
Alt. Cost			1.00	.16	.19	.23 ³	-.02	-.15	-.11	-.13	.07
EPQ Psycho.				1.00	.29 ¹	.56 ¹	.00	-.36 ¹	-.18 ³	-.04	-.03
EPQ Extra.					1.00	.20 ³	.03	-.09	-.10	.08	-.10
EPQ Neuro.						1.00	-.07	-.22 ³	.12	-.01	.02
EPQ Lie							1.00	-.09	.01	.16	-.26 ²
Guilt								1.00	.37 ¹	-.07	.09
Shame									1.00	.14	-.04
Intrinsic Rel.										1.00	-.26 ²
Extrinsic Rel.											1.00

1 p < .001; 2 p < .01; 3 p < .05

Table 7.
Correlations Between All Measures for Female Subjects

	ALTRUISM			Psycho.	EPQ-R			DCQ		IERO	
	Give	Receive	Cost		Extra.	Neuro.	Lie	Guilt	Shame	In. Rel.	Ex. Rel.
Alt. Give	1.00	.80 ¹	.07	.06	.34 ¹	.03	.00	.08	-.22 ¹	.00	.06
Alt. Receive		1.00	.11	.23 ²	.35 ¹	.08	-.08	.00	-.27 ¹	-.01	.06
Alt. Cost			1.00	.08	.04	.14	-.09	-.06	-.06	.06	.11
EPQ Psycho.				1.00	.20 ²	.36 ¹	.11	-.33 ¹	-.11	-.08	-.21 ²
EPQ Extra.					1.00	.06	.03	-.02	-.20 ³	.05	-.07
EPQ Neuro.						1.00	-.18	-.08	.15	.03	-.09
EPQ Lie							1.00	.02	.03	.02	-.05
Guilt								1.00	.46 ¹	.11	.11
Shame									1.00	.15	-.06
Intrinsic Rel.										1.00	-.15
Extrinsic Rel.											1.00

1 p < .001; 2 p < .01; 3 p < .05

were obtained for both sexes between psychoticism and receiving help. This relationship was found for Hawaii subjects in the cross cultural study by Johnson et al.

Some important differences in male and female profiles with regard to helping are revealed in Tables 6 and 7. First there is a striking gender-difference in the correlations between the measure of giving help and the two DCQ dimensions. For males, give-help scores are correlated positively with guilt, and negatively, but not significantly, with shame. For females, give-help has a significant negative relationship with shame and a neutral relationship with guilt. Female receive-help scores also show a significant negative relationship with shame, and no relationship to guilt. Male give-help scores are unrelated to either of the DCQ scales.

Two other gender differences revealed in Tables 6 and 7 concern the rate-cost measure. One might have predicted that high rate-cost scores would correlate negatively with high give-help scores for females but not males. This would be in keeping with the "chivalrous" motivation attributed to male altruists by Eagly and Crowley (1986). This particular gender-difference did not materialize, but a significant positive relationship was observed between the rate-cost measure and the receive-help measure for male subjects. Another relationship unique to the male sample

is a positive and significant correlation between rated cost of helping and neuroticism scores.

The issue of gender differences in altruism was further pursued by investigating mean differences between male and female subjects on the altruism measures. The results of the t-tests conducted between sexes on all three altruism measures appear in Table 8 and they show significant differences on each. Males are significantly more likely to report having given and received help, and they rate helping as being overall less costly than do females. The only other predictor of altruism to surface in the correlation matrices of both sexes is extraversion. T-tests conducted on the EPQ-R scales failed to show a significant difference between male and female E scores.

Table 8. Differences in Mean Altruism Scores by Gender

Gender	Give Help	Receive Help	Rate Cost
Males (126)	2.48	2.07	1.68
Females (208)	2.28	1.98	1.86
	t=3.77 ¹	t=1.98 ²	t=2.24 ²

¹ p < .001; ² p < .05

Cohort Comparisons

The present study represents the first opportunity to test the Johnson et al. version of the self report altruism

scale on a non-undergraduate population. Since a principal motivation for expanding on the original Rushton version of the altruism measure was to extend the range of behaviors measured and embrace a wider segment of the population, cohort comparisons constitute an important facet of the family study.

Separate sets of correlations were calculated for parent and offspring cohorts. The cohorts are not quite clean, as some of the undergraduates surveyed were older students. However, 86% of the undergraduates are 25 years old or younger, and only three undergraduates are over thirty. None of the students was older than the youngest parent. The parental cohort spans a similarly wide range (38 to 73 years of age), but as with the younger group of subjects, the majority of this group is of a single, distinct cohort. Eighty-eight percent of the parent group falls between the ages of 38 and 60 years.

Correlations for the younger generation of subjects appear in Table 9, while the correlation matrix for the older generation appears in Table 10. Once again, important similarities and important differences appear. The essential similarities include the positive correlations between give-help scores and scores on the receive-help, extraversion, and guilt scales; between receive-help scores and scores on the rate-cost, extraversion, and psychoticism

Table 9.
Correlations Between All Measures for Younger Subjects

	ALTRUISM			Psycho.	EPQ-R			DCQ		IERO	
	Give	Receive	Cost		Extra.	Neuro.	Lie	Guilt	Shame	In. Rel.	Ex. Rel.
Alt. Give	1.00	.82 ¹	.10	.16	.37 ¹	.01	-.01	.23 ²	-.13	.01	.01
Alt. Receive		1.00	.23 ²	.23 ²	.35 ¹	.11	-.09	.14	-.07	-.02	.00
Alt. Cost			1.00	.16	.19 ³	.23 ³	-.02	-.16	-.11	-.13	.07
EPQ Psycho.				1.00	.29 ¹	.56 ¹	.00	-.36 ¹	-.18 ²	-.04	-.03
EPQ Extra.					1.00	.20 ³	.03	-.09	-.10	.08	-.10
EPQ Neuro.						1.00	-.07	-.21 ³	.12	-.01	-.02
EPQ Lie							1.00	-.09	.01	.16	-.26 ²
Guilt								1.00	.37 ¹	-.07	.09
Shame									1.00	.14	-.04
Intrinsic Rel.										1.00	-.26 ²
Extrinsic Rel.											1.00

¹ p < .001; ² p < .01; ³ p < .05

Table 10.
Correlations Between All Measures for Older Subjects

	ALTRUISM			EPQ-R				DCQ		IERO	
	Give	Receive	Cost	Psycho.	Extra.	Neuro.	Lie	Guilt	Shame	In. Rel.	Ex. Rel.
Alt. Give	1.00	.83 ¹	.21 ²	.10	.33 ¹	.02	-.03	.16 ²	-.25 ¹	-.01	.07
Alt. Receive		1.00	.23 ¹	.23 ¹	.30 ¹	.08	-.06	.04	-.24 ¹	-.02	.04
Alt. Cost			1.00	.17 ³	.11	.18 ²	-.01	-.13	-.13	-.06	.06
EPQ Psycho.				1.00	.21 ²	.47 ¹	.02	-.37 ¹	-.18 ²	-.08	-.05
EPQ Extra.					1.00	.13	.06	-.06	-.15 ³	.06	-.02
EPQ Neuro.						1.00	-.07	-.14 ³	.15 ³	.02	-.01
EPQ Lie							1.00	.10	.09	.05	-.08
Guilt								1.00	.46 ¹	.06	.05
Shame									1.00	.14	-.09
Intrinsic Rel.										1.00	-.25 ¹
Extrinsic Rel.											1.00

¹ p < .001; ² p < .01; ³ p < .05

scales; and between rate-cost scores and neuroticism scores.

The important differences between the two generations center around the rate-cost measure and the DCQ shame measure. Rated cost of helping correlated positively with giving help and with psychoticism for both groups but only the correlations for the older subjects were significant. Conversely, the correlation between the rate-cost and extraversion measures, while positive for both groups, is significant only for the younger subjects. Giving and receiving help correlate negatively with shame scores for all subjects, but these are again significant only for the older subjects.

Mean differences between the generations on altruism measures were investigated by the use of t-tests. The results of this analysis appear in Table 11. The only statistically significant difference between the two groups is on the rate-cost measure with younger subjects rating items as more costly.

Since neuroticism predicted rated cost of helping for both cohorts, t-tests were conducted between cohorts for this along with the other EPQ-R measures. Table 12 contains the results of these analyses. As anticipated, younger subjects score significantly higher on the Eysenck measure of neuroticism. They also score significantly higher in extraversion, which may help to explain the

failure of the older, more experienced cohort to score significantly higher on measures of giving and receiving help. The significant difference between the cohorts on the lie scale of the EPQ-R, while not meaningful in terms of the difference between the groups in rated cost of helping is interesting in its own right as it suggests that subjects from the older generation may be more strongly motivated to represent themselves as morally upright than the college-aged group. This may call into question the significant positive correlation between the give-help and rate-cost measures which is unique to the older cohort.

Table 11. Differences in Mean Altruism Scores by Cohort

Cohort	Give-Help	Receive-Help	Rate-cost
Older (216)	2.38	1.99	1.63
Younger (118)	2.31	2.05	2.09
			t=5.82 ¹

Values of t-tests are presented only for statistically significant differences

¹ p < .001

Table 12. Differences in Mean
EPQ-R Scores by Cohort

Cohort	Psychot.	Neurot.	Extrav.	Lie
Older (216)	2.87	10.08	11.29	3.31
Younger (118)	3.00	13.70	13.27	2.38
		t= 5.72 ¹	t=4.08 ¹	t=5.06 ¹

Values of t-tests are presented only for statistically significant differences

¹ p < .001

Cohort by Sex Interactions

Two (cohort) by two (sex) analyses of variance were conducted on the three altruism measures and these failed to reveal any significant interactions between these two variables. Similar two-way ANOVAs were conducted on the correlates of altruism, and these revealed an interaction between sex and cohort on the guilt dimension of the DCQ. ($F=9.48$; $p<.01$). Although no such interaction was found for the shame dimension, there does appear to be a relationship between age and gender and the guilt/shame profile. A comparison of DCQ and altruism data from Tables 7 and 8 shows guilt to be a positive predictor of helping for males only, while shame is a negative predictor of altruism for females only. A similar comparison of DCQ and altruism data in Tables 9 and 10 shows shame to be a significant negative predictor of altruism only for the older cohort. Further, neither guilt nor shame predict

altruism for male or female offspring alone. These data suggest a strong sex difference in the DCQ correlations with altruism which is limited to the older cohort. Table 13 breaks down the relationship between DCQ and altruism measures by gender for the parental cohort. As predicted, two distinct profiles emerge with guilt correlating positively with male give-help scores and shame correlating negatively with female give-help and receive-help scores.

Table 13. Correlations Between Altruism and DCQ Measures for Older Male and Female Subjects

	MALES			FEMALES		
	Give	Receive	Cost	Give	Receive	Cost
Guilt	.29 ²	.19	-.13	.12	-.04	-.15
Shame	-.13	-.06	-.15	-.25 ³	-.32 ¹	-.19

¹ p < .001; ² p < .01; ³ p < .05

Item-Mean Correlations

Correlations of the means of individual items in the three altruism measures were conducted in order to assess the degree to which different groups of subjects respond similarly to individual items, and in order to assess the relationship of help-received and cost-of-helping for the items. Table 14 shows the item correlations for each sex, and Table 15 shows a similar analysis by cohort. A review

of the data contained within these two correlation matrices reveals strong patterns of similarity between sexes and between generations in scores assigned the individual items on all three measures of altruism. Despite observed mean differences between some groups on some of these measures, all subjects seem to be in general agreement on most of the various items comprising those means. All groups show a very strong correlation between the give-help and the receive-help measures as well.

The item mean correlations in Tables 14 and 15 yield another important bit of information concerning group differences in altruism. Table 14 reveals a different relationship between the give-help and rate-cost measures for the two sexes. For male subjects, this relationship for any given item is neutral, while for females a strong negative correlation is observed. A similar profile emerges in the item-mean correlations between the two cohorts in Table 15. Here a negative relationship between helping and cost is observed for the younger generation, while for older subjects there is no significant relationship between these two measures at all. Thus, it appears that sex and age do indeed predict the nature of the relationship between altruism and cost of helping for individual altruistic acts. Female subjects, and younger subjects are more likely to report that they help less often in situations involving high cost.

Table 14. Correlations of Item Means
of Altruism Measures Between Sexes

	MALE SUBJECTS			FEMALE SUBJECTS		
	Give	Receive	Cost	Give	Receive	Cost
M. Give	1.00	.91 ¹	-.07	.91 ¹	.91 ¹	-.31 ³
M. Rec'v.		1.00	-.38 ²	.85 ¹	.92 ¹	-.45 ²
M. Cost			1.00	-.07	-.44 ²	.86 ¹
F. Give				1.00	.96 ¹	-.32 ³
F. Rec'v.					1.00	-.52 ¹
F. Cost						1.00

¹ p < .001; ² p < .01; ³ p < .05

Table 15. Correlations of Item Means
of Altruism Measures Between Cohorts

	OLDER SUBJECTS			YOUNGER SUBJECTS		
	Give	Receive	Cost	Give	Receive	Cost
O. Give	1.00	.94 ¹	.06	.91 ¹	.90 ¹	-.49 ¹
O. Rec'v.		1.00	-.43 ²	.91 ¹	.93 ¹	-.54 ¹
O. Cost			1.00	-.10	-.38 ²	.66 ¹
Y. Give				1.00	.97 ¹	-.47 ¹
Y. Rec'v.					1.00	-.47 ¹
Y. Cost						1.00

¹ p < .001; ² p < .01; ³ p < .05

The Influence of Type of Sacrifice

Clearly the cost factor involved in specific acts of altruism is more important for some groups than for others. It would be useful to know if the nature of the cost involved in particular altruistic acts played a role in these group differences. In their "Cross-cultural assessment of altruism", Johnson and his colleagues conducted t-tests of male and female altruism means of scale items grouped into the five different categories of sacrifice that were presented to subjects in the present study at the back of their test booklets. In the Johnson et al. study, items were grouped post-hoc by Johnson and by the present author, with a third party resolving disagreements between the two groupings. While the most consistent differences between sexes occurred in the risk-of-harm category, differences existed in each of the other categories as well. In the present study categorization of items is conducted by the subjects themselves. Although there were no cases of unanimous agreement among subjects, in most cases there was a clear majority favoring a particular category. Items in the "money and goods" and "risk of harm" categories were most unanimously agreed upon, while "loss of status category" were the least so. This latter category often barely beat out the "risk of harm" category suggesting that loss of status and risk of psychological harm may be confounded. "Time" and "time

plus effort" categories also were very close on several items. Despite the presence of gray areas within some of the categories, it is hoped that allowing subjects to decide upon categories of sacrifice for the individual items will provide categories which are more valid, and better able to cleanly predict group differences. The 56 items of the altruism scale, along with their respective categories are contained in the Appendix. The major difference between the new categories and the post-hoc categories generated by Johnson and Darvill is an expansion of the "time and effort" category at the expense of the "time" and "loss of status" categories. Two (sex) by two (cohort) ANOVAS were conducted on the mean give-help scores in the five categories. Main effects were found for all of the 15 measures save the receive-help measure in the time-and-effort category. There were no significant interactions. In 9 of the 15 categories, a main effect of gender was found, and in every instance the mean for the male subjects was higher. Table 16 shows the means of each of the 15 measures for each sex, along with the results of individual t-tests where significant differences were found. Four of these differences involve give-help measures (time, time/effort, money/goods, and risk of harm), and three others involve receive-help measures (time, money/goods, and risk of harm). There were also four significant differences between the genders in rated

cost of helping, but the results of the two-way analyses of variance indicate that gender differences do not account for a significant portion of the variance on the rate-cost variables for this sample. The finding of significantly higher mean scores for males across categories of giving and receiving help confirms that of the Johnson et al. (1989) study.

Observed main effects for cohort on the 2 x 2 ANOVAs included only two main effects on the give-help measure. Younger subjects had higher mean give-help scores in the risk of status-loss category, while older subjects' mean giving was higher in the money/goods category. Main effects for the receive-help measure were observed in the time and loss of status categories. Both show higher mean scores for the younger subjects; however subsequent two-tailed t-tests revealed a significant difference only in the loss of status category. The two-way ANOVAs revealed that the majority of the variance on the cost measures is attributable to cohort differences, with younger subjects rating cost of helping higher in all categories. Means on the 15 measures for each cohort along with the results of separate t-tests on each appear in Table 17.

Table 16. Differences in Mean
Altruism Scores for Five Categories by Gender

Altruism Measure	Males	Females	T Value
Give-help			
Time	2.58	2.46	2.29 ²
Time/Effort	2.47	2.24	3.95 ¹
Money/Goods	2.88	2.63	3.46 ¹
Risk of Harm	1.90	1.56	5.30 ¹
Loss of Status	2.29	2.20	
Receive-help			
Time	2.46	2.35	2.05 ³
Time/Effort	2.12	2.07	
Money/Goods	2.10	1.69	5.70 ¹
Risk of Harm	1.50	1.34	3.16 ²
Loss of Status	2.02	1.95	
Rate-cost			
Time	1.44	1.61	2.25 ³
Time/Effort	1.67	1.84	2.10 ³
Money/Goods	2.04	2.11	
Risk of Harm	1.72	2.05	2.76 ²
Loss of Status	1.75	1.97	2.27 ³

Values of t-tests are presented only for statistically significant differences

¹ p < .001; ² p < .01; ³ p < .05

Table 17. Differences in Mean
Altruism Scores for Five Categories by Cohort

Altruism Measure	Older	Younger	T Value
Give-help			
Time	2.49	2.54	
Time/Effort	2.36	2.27	
Money/Goods	2.85	2.50	4.88 ¹
Risk of Harm	1.74	1.59	2.15 ³
Loss of Status	2.15	2.38	3.24 ¹
Receive-help			
Time	2.37	2.43	
Time/Effort	2.10	2.08	
Money/Goods	1.86	1.85	
Risk of Harm	1.41	1.40	
Loss of Status	1.88	2.14	4.06 ¹
Rate-cost			
Time	1.41	1.78	5.01 ¹
Time/Effort	1.62	2.06	5.21 ¹
Money/Goods	2.01	2.22	2.91 ²
Risk of Harm	1.68	2.37	6.03 ¹
Loss of Status	1.66	2.30	6.80 ¹

Values of t-tests are presented only for statistically significant differences

¹ p < .001; ² p < .01; ³ p < .05

V. DISCUSSION

Altruism and the Family

The central hypothesis of the family study of altruism is that the altruistic personality is transmitted across generations through the family unit. This hypothesis seems to be quite well supported by the present data. Of the three measures of altruism, two (receive-help, and rate-cost) show better than chance parent/offspring correlations for both parents, and one (the give-help measure) shows a positive, statistically significant relationship between fathers and daughters. The absence of correlations between unrelated individuals from the two cohorts further strengthens the basic premise that the altruistic personality is transmitted across generations through the family unit.

Results of the attempt to demonstrate the transfer of personality correlates of altruism from one generation to the next were equivocal. Of the four correlates of altruism established by the Johnson et al. study, only extraversion correlated positively across generations. It is worth noting, however, that extraversion was the personality measure most strongly associated with giving and receiving help in that study, and that this result was replicated here. As was the case with the give-help measure, the across-generation association is limited to a strong correlation between fathers' and daughters' E

scores. The difficulty in obtaining male subjects makes it unwise to draw any conclusions regarding parent/son correlations, but the low negative relationship between paternal E and sons' E scores warrants future investigation into the relationship between fathers and sons on both altruism and adjustment measures. This is particularly so in light of the large number of significant correlations between fathers and offspring on the various other EPQ-R scores (see Table 4). Again, data from an N of 18 may not be safely interpreted, but the correlations between fathers and sons on the P and N scales were large enough to obtain statistical significance, and the latter correlation was a remarkable $+0.75$.

The absence of a statistically significant relationship between mother and daughter scores on help-giving and extraversion adds yet another wrinkle to the already complex issue of gender differences in self-reported altruism, as it suggests a special role for fathers in encouraging altruism in female offspring. The exclusive relationship between fathers' intrinsic religious orientation and daughters' give-help scores provides yet another intriguing piece of this puzzle. Such a special role for fathers would be in keeping with other data on parent-offspring altruism. For example, the already cited research of Hoffman (1975) which demonstrated a

cross-gender effect of the use of inductive/victim-centered discipline on childrens' rated altruism fits well with this notion. Presumably, parents who use a victim-centered approach to child-rearing are likely to rate high in altruism, intrinsic religious orientation, and possibly extraversion. Discovery of whether or not a mother/son connection exists for these personality characteristics must await the recruitment of sufficient numbers of male offspring at a later date.

Assessing Cost of Helping

Adding a cost-of-helping measure in place of the original rate-importance measure yielded a number of interesting results. Although the predicted negative correlations between cost and the remaining two measures of altruism never materialized, the high positive correlations found by Johnson et al. (1989) between importance of helping, and giving and receiving help were not observed between cost of helping and the give- and receive-help measures. Further, when correlations were calculated between means of individual items, a negative relationship between the receive-help and rate-cost measures was found for all groups of subjects. Correlations among the means of the items also revealed the predicted pattern of group differences in the

give-help/rate-cost relationship, with female and younger subjects' mean item scores on these two measures showing a significant negative correlation while for males and older subjects this correlation was insignificant.

The prediction that the cost of helping measure would fail to correlate positively with the guilt dimension of the DCQ in the way the original "importance of helping" measure did was also borne out, suggesting that the rate-cost measure utilized in the present study does in fact tap into a different dimension of altruism than the rate-importance measure used in the original scale. This being the case, and considering the high coefficient alpha reliability obtained on both measures, the construction of a scale utilizing both may yield important information. If it is assumed that what is being assessed by the "importance" measure is the subjects' estimate of the benefit of the act to the beneficiary, then the use of both measures would yield a cost/benefit dimension (cost to the altruist versus benefit to the helped). Such a measure would be an important contribution to the assessment of individual differences in altruism for at least two reasons. First, it would provide a means of testing an important hypothesis arising from Trivers' theory of reciprocal altruism. Recall that one of the important predictions of Trivers' theory is that individuals will be sensitive to the cost/benefit dimension of helping, and will be more likely

to help when benefit is high relative to cost. The present data, combined with those from the Johnson et al. (1989) study on the rate-importance measure provide a degree of indirect support this hypothesis. A scale which could yield data from both measures on the same subject would enable a much finer assessment of Trivers' prediction.

Aside from facilitating the empirical testing of the sociobiological view of human altruism, a cost/benefit dimension may help shed light on the observed gender differences in self-reported altruism. Clearly women's altruism scores are more sensitive to suppression by the cost factor. If the view of Eagly and Crowley (1986) that women are motivated to help by a desire to nurture has any merit, the dynamics of cost and benefit should be especially important in their motivation to help. Looking at altruistic motivation in terms of a cost/benefit ratio may prove to be a more valid way to assess altruistic behavior in female subjects.

Gender Differences in Altruism Scores and Correlates

The issue of gender differences in self-report altruism scores continues to resist all attempts to explain it. The first use of the 56 item altruism scale was in the cross-cultural study of Johnson and his associates. One finding of that study was a strong, consistent tendency for

the scale to yield higher mean altruism scores for males than for females. The present study reveals this same tendency. Johnson and his colleagues initially attempted to address the issue of gender bias in the scale by dividing items into different categories based upon what type of sacrifice was involved in the various acts of helping. It was predicted that the high physical risk items, added to broaden the scope of the scale, would account for the relatively lower scores of female subjects. This hypothesis was not borne out. Although the greatest mean difference was in the "risk of harm" category, differences occurred in all of the other categories as well. Essentially the same results were obtained in the present study which generated categories based upon subject ratings of the items. Attempts to alter the wording of the items to include altruism toward friends and relatives have also failed to reduce the gender discrepancy (Johnson, unpublished data). Research is currently being conducted by the second author of "A cross cultural assessment of altruism" (George P. Danko) on this issue.

The issue of gender differences aside, another intriguing gender-related question arises from the present data. Male and female subjects present very similar profiles with regard to correlates of altruism with the single exception of the DCQ variables. The data suggest that sensitivity to guilt is an important predictor of

altruism among males but not females, although female mean scores on the guilt dimension were significantly higher than those of male subjects. For female subjects, higher altruism scores are predicted by lower scores on sensitivity to shame. Shame also correlated negatively and significantly with extraversion for female subjects. Extraversion has proven to be strong predictor of altruism in both the present study and the Johnson et al. (1989) study. This finding is consistent with Trivers' prediction that reciprocal altruism selects for an eagerness to forge new friendships (new reciprocal alliances). If this is so, one would expect individual differences in altruism to correlate with individual differences in "people-oriented" personality traits such as extraversion.

Age Differences in Altruism Scores and Correlates

The significantly more altruistic older generation predicted by in the initial hypotheses of this study did not quite materialize. Overall mean give-help and rate-help scores did not differ significantly between generations, despite the fact that younger subjects rated items as more costly overall. However, dividing the items by the nature of the sacrifice involved in helping did yield results consonant with the earlier stated hypothesis regarding cohort differences. Older subjects were more

likely to sacrifice money or risk physical or psychological harm than were younger subjects.

The greatest source of between-cohort mean differences in altruism measures rests with the cost-of-helping dimension. As predicted, younger subjects considered all acts of altruism to be more costly than did older subjects. Again, this is consistent with a sociobiological view which would predict that any investment of resources is more costly to one whose genetic fitness has yet to be insured by offspring. The fact that the highest t values were for mean differences in the risk of harm and loss of status categories further strengthens the sociobiological hypothesis. Interestingly, the lowest single t value was for the money/goods category.

The correlational data for the two cohorts also reveals a different relationship between cost and helping for each group. For the older subjects cost actually correlates positively with both give- and receive-help scores, suggesting that older subjects who regard helping as costly are likely to report helping frequently. Again, in light of the higher lie scale scores for the older group, this may result from social desirability factor specific to this group. This seems dubious, however, since the mean lie score for these subjects, while higher than that of the younger group, is quite low relative to the norms established for the EPQ-R lie scale. An alternative

explanation may be that the older subjects simply have had more experience with helping in situations involving money or risk of harm, and are thus more keenly aware of the cost factor than their relatively naive younger counterparts.

When item means are correlated, the relationship between the give-help and rate-cost measures for the older cohort is neutral, while younger subjects show a very strong negative correlation between cost and helping for individual items. These data seem more consistent with the "older but wiser" profile of the subjects in the older cohort. There was no systematic tendency for these subjects to rate the specific acts of helping they reported having committed as particularly costly, rather those that are high in frequency of helping are more aware of the costs involved.

The Altruistic Personality

Aside from establishing the role of the family in observed individual differences in altruism, the most important goal of the present study was to confirm the findings of the previous research conducted using the three-measure altruism scale. This goal was accomplished. The most important predictor of altruism in the present study, as in the previous research of Johnson et al. (1989), is past experience with having been helped. The high item mean correlations between giving and receiving

help suggest that specific acts of helping may be motivated by specific past experiences. This finding is consistent with Trivers' theory of reciprocal altruism which is predicated on the notion that we are selected to favor altruism within a system of balanced reciprocity. Of course, the altruism scale deals with help given to strangers and acquaintances rather than friends and reciprocal allies, but Trivers' theory seems to allow for the benefits of altruism to spill over into help for potential new reciprocal partners, or friends or relatives of reciprocal partners. Further, the questions were phrased in such a way as to make the past benefactor of the subject a stranger or acquaintance as well. The emotions which Trivers suggests have been selected for in order to promote reciprocal altruism (e.g., sympathy, guilt, etc.) may be expected to motivate one who has been helped by a stranger to help another stranger in turn.

Apart from the important factor of past experience with receiving help, the most consistent predictors of altruism in the Johnson et al. study were extraversion, guilt, shame, and intrinsic religious orientation. The present research offers strong confirmation of the role of extraversion and dimensions of conscience in the altruistic personality. Extraversion was once again the most powerful predictor of altruism after past experience with being helped. This strong, stable finding is consistent with

London's (1970) profile of Christians who aided Jews during the holocaust. Aside from a strong identification these individuals were marked by a strong sense of adventurousness. The guilt and shame measures correlated differently with altruism for males and females in both the present study and the cross cultural assessment of altruism, although significance was reached on both dimensions for both sexes in the previous study. This difference may be merely a matter of the much smaller sample size here (N=334 vs. N=1056). Religious orientation was not an important factor in predicting altruism in the present sample, but the relationship between intrinsically religious fathers and daughters' altruism may be worth further study.

The existence of a stable altruistic personality is supported by the present data, and future directions for research in this area are suggested. The differential influence of fathers and mothers on daughter altruism must certainly be pursued, as must the influence of parental altruism on sons' helping behavior. A new possibility for testing Trivers' sociobiological theory of altruism exists now that the potential for measuring the cost/benefit dimension of helping has been established. Progress in these areas should add significantly to our understanding of the altruistic personality and the forces that go into its creation.

APPENDIX

Altruism Scale

Abbreviations: T=time; T/E=time and effort; M/G=money or goods; R=risk of physical or psychological harm; LS=loss of status or of potential gain of status.

- T/E (1) I have helped push or restart a stranger's car when it was stalled
- T (2) I have given directions to a stranger
- T (3) I have made change for a stranger
- M/G (4) I have given money to a charity
- M/G (5) I have given money to a stranger who needed it (or asked me for it)
- M/G (6) I have donated foods or clothes to a charity
- T/E (7) I have done volunteer work for a charity
- T/E (8) I have donated blood
- T/E (9) I have helped carry a stranger's belongings (books, parcels, etc.)
- T (10) I have delayed an elevator and held the door open for a stranger
- T (11) I have allowed someone to go ahead of me in a line/queue
- R (12) I have given a stranger a lift in my car
- T (13) I have pointed out a clerk's error (bank, market) in undercharging me for an item
- M/G (14) I have let a neighbor whom I didn't know too well borrow an item of some value to me (e.g., a dish, tools, etc.)
- M/G (15) I have paid a little more to buy an item from a merchant who I felt deserved my support

- T/E (16) I have helped a classmate who I did not know that well with a homework assignment when my knowledge was greater than his/hers
- T/E (17) I have looked after a neighbor's pets without being asked and without being paid for it
- T (18) I have offered to help a handicapped or elderly stranger across a street
- T/E (19) I have offered my seat on a bus or tram to a stranger who was standing
- T/E (20) I have helped an acquaintance to move households
- T/E (21) I have helped a neighbor whom I didn't know that well work on his house
- LS (22) I have absorbed the blame for the mistake(s) of a work-mate when he needed the help
- LS (23) I have done something I honestly felt was wrong in order to help someone I didn't know that well out of trouble
- T (24) I have helped someone I didn't know get up when (s)he slipped or tripped and fell done
- T/E (25) I have helped an acquaintance obtain something important that he or she needed (e.g., a job, a place to live, etc.)
- T/E (26) I have worked past my shift to help someone make a production quota
- R (27) I have called the police after witnessing a crime and identified myself
- LS (28) I have shared credit for an accomplishment when I could easily have taken it all
- LS (29) I have "bent the rules" to help someone I didn't know that well
- T/E (30) I have helped a new fellow-employee at work get settled on the job and learn the tasks involved, even though it was not part of my job
- R (31) I have moved my car into a dangerous position to avoid hitting a pedestrian

- LS (32) I have helped an acquaintance out of a personally embarrassing situation and kept it confidential for his/her sake
- T/E (33) I have volunteered to nurse an acquaintance who was ill
- T/E (34) I have helped a neighbor who needed it harvest his crops
- R (35) I have defended someone I didn't know from being physically harmed
- LS (36) I have deceived someone when I felt it was for their own good
- T/E (37) I have voluntarily served as a witness in a court of law
- M/G (38) I have loaned my car to friends or neighbors
- R (39) I have calmed someone I didn't know who was behaving in a visibly disturbed or frightened manner in public
- R (40) I have walked a stranger through a dangerous area (e.g., neighborhood, parking lot, etc.)
- T (41) I have sacrificed a parking space to a stranger
- LS (42) I have stuck my neck out to "cover for" a work-mate
- T (43) In heavy traffic, I have slowed to let someone coming toward me make a turn in front of me even though it meant having to wait through the red light
- T/E (44) I have stopped on a highway to help a stranger fix a flat tire
- LS (45) When playing a team sport, I often sacrifice an opportunity to score when I see that another player has a better chance
- T/E (46) I have "picked up the slack" for another worker when he couldn't keep up the pace
- T/E (47) As part of a group of people, I have done menial jobs that needed doing without being asked even though they were not part of my responsibilities

- LS (48) I have been offered responsibilities at work which I have declined in favor of a more qualified colleague
- LS (49) On occasion, I have "stretched the truth" to help someone out of an embarrassing situation
- T (50) I have taken a lost child to a store manager so its parents could be found
- R (51) I have saved someone's life (e.g., from drowning, a fire, etc.)
- T (52) I have answered the questions of someone doing a door-to-door or telephone survey
- T/E (53) I have volunteered to work in a hospital
- T/E (54) I have contributed my time and labor to community improvement activities
- R (55) I have attempted to calm someone who was behaving in a frighteningly strange or psychotic fashion
- LS (56) I have worked on a committee of a legal but unpopular minority organization

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