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Cooperation and competition among aged parents and adult children

Montoro, Julian, Ph.D.
Case Western Reserve University, 1994

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COOPERATION AND COMPETITION
AMONG AGED PARENTS AND ADULT CHILDREN

by

JULIAN MONTORO

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy

Thesis Adviser: Dr. Jetse Sprey
Department of Sociology
CASE WESTERN RESERVE UNIVERSITY
May, 1994
COOPERATION AND COMPETITION

AMONG AGED PARENTS AND ADULT CHILDREN

Abstract

By

JULIAN MONTORO

This study examines the social structure of cooperation and competition in the aged parent and adult child relationship. Elderly parents and adult children may use different strategies to influence each other to resolve conflicts in a way which is mutually rewarding. Using game theory, data (N = 113 dyads) were collected from two mixed-motive games of cooperation and conflict--Prisoner's Dilemma and Chicken.

In particular, the present study explored the emergence of intergenerational cooperation between elderly parents and their adult children; aged parents and adult children dyads were classified into different response state groups regarding their reactive cooperative or competitive strategies; the relation between a dyad's perception of each other while engaged in a conflict situation was examined; and social and personal characteristics were related to each outcome group.
On the basis of the subjects' interaction, dyads were classified into four stable response outcome groups: a) cooperators (Doves); b) competitors (Hawks); c) dominant-submissive (Dom-Sub); and d) moderate cooperators (Sneakers). Analysis of their preasymptotic interaction patterns revealed differences among these outcome groups. In particular, Doves made more intentions and actual cooperative behavior than the other dyads. Results also indicated a significant effect for the type of conflict: high conflict situation (Chicken game) versus low conflict situation (Prisoner's dilemma), over couples' strategic variables. No differences were found with regard of the subject's personal and social characteristics and their classification into each outcome group. Implications for public policy, family caregiving and intergenerational relations were considered.
CASE WESTERN RESERVE UNIVERSITY

GRADUATE STUDIES

We hereby approve the thesis of

___________________________
Julian Montoro

candidate for the Ph.D. in Sociology

degree.*

(signed)

___________________________
(chair)

___________________________

___________________________

(___________________________)

date 11/18/93

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[Signature]
"Entre el amor y el egoísmo se da un conflicto sin tregua:
Lo que ganamos en egoísmo lo perdemos en amor.
Lo que ganamos en amor lo perdemos en egoísmo...."

"El oficio de ser hombre es el arte de entregarse en el momento
oportuno y a las personas adecuadas...."

ACKNOWLEDGMENTS

I wish to express my sincerest appreciation and debt to my Thesis Advisor, Jetse Sprey, for the opportunity to work with him. He always encouraged me to develop and complete this work with his invaluable guidance, advise, instruction and assistance throughout the two year process of thesis. Of many friends that supported and advised me I should like to say a special thankyou to Tracy Fedirko for her continuous feedback and wit.

Of course, the data in this study represent only a few (but to me very important) strategies of conflict resolution that parents and their adult children shared with me: I want to thank you for providing some answers and raising new questions.

Finally, the complexion of this thesis would not have been possible without the Fulbright-MEC doctoral grant that I received from the Government of Spain and the U.S. International Institute of Education.
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I. INTRODUCTION:

The aging of modern industrial societies has brought with it new concerns about the relations among individuals. In the United States, due to the declining fertility and mortality rates, the number and proportion of older americans has been growing substantially (U.S. Bureau of Census, 1989). This "demographic revolution" (Pifer and Bronte, 1986) is expected to have an effect on individuals and social institutions. Social institutions such as the family are being challenged (Shanas, 1980). In particular, older people and their families find themselves in a situation wherein the relationship between parents and children is particularly affected. Older people are living longer and with a higher level of physical health, and as a result, aged parents and their adult children will have more potential not only for a continuation of the parent-child relationship, but also for a prolonged experience of caring for each other (Riley and Riley, 1986).

The issue of generational equity has also become a subject for national debate and public policy during the past decade (Binney & Estes, 1988; Lawlor, 1991). Older parents and adult children are being challenged to develop a new range of strategies, human relations and systems of interaction that support their participation in the later years of the parents' life. The concept of generation when
applied to aged parents and adult children relationship carries two different levels: first, it indicates the microlevel of rank-decent ordering of family members, and second, it also conveys the macrolevel of age group reciprocities and equities (Bengtson, 1993).

The relationship between elderly parents and adult children is carried on by both a sense of kin obligation and personal choice (Rossi & Rossi, 1990). Such relationships could range widely, from reversed roles, as more and more adult children find themselves taking care of their own parents, to partnership as active elderly involve themselves in family and community activities (Mancini & Blieszner, 1989). Contrary to popular belief, older people are not abandoned by their children. Older people and their adult children tend to maintain ongoing relationships with one another (Wellman, 1991). In general, the basic conceptual approaches applied to the aged-parent adult-child relationship, are based on the model of family solidarity (Bengtson & Roberts, 1988). This model assumes that in the dynamic relationships among generations there is a transition from relationships based upon obligation to those voluntarily assumed and maintained by aged parents and their adult offspring (Hess and Waring, 1978). This theory of intergenerational solidarity examines family structure, affectual, consensual, functional, asociational and normative solidarity. Association is defined as interaction, affection as positive sentiment, and consensus as extent of agreement in values and beliefs. In contrast
to the large number of studies based on the family solidarity model, very few empirical investigations of the aged-parent and adult-child relationship have used a conflict perspective (Johnson & Vinick, 1981; Clemens & Axelrod, 1985; Suitor & Pillemer, 1988; Synge, 1988; Hall, 1989). However, findings from both empirical and conceptual approaches do not seem to provide any generally established conclusion about the process of conflict resolution between aged parents and adult children.

The present study represents a new direction in research on the interaction patterns between elderly parents and adult children by focusing on what strategies elderly parents and adult children develop in order to resolve their interpersonal conflicts. The specific aim of this study is to describe the process and structure of cooperation and competition among elderly parents and adult children. It attempts to investigate the effects of dyadic strategies, that will provide the empirical basis for research into the causes and consequences of cooperation and competition among elderly parents and their adult children. It attempts to explore if different strategies of cooperation and competition among aged parents and adult children can be recognized, and furthermore, if these specific strategies can be associated with stable patterns of conflict resolution.

Human relations are based on the ability and motivation of people to negotiate, manage, react, or respond, in a cooperative and/or competitive manner.
Therefore, people, friends, spouses, family members, etc., may hold harmonious bonds and may live in mutual respect in the face of great differences in beliefs of values (Sprey, 1969). Intergenerational relations, and in particular the aged parent and adult child bond are, presumably, of an intimate nature, and of long duration. Their differences in values, arguments and conflicts, must be strategically managed and negotiated in a way that whatever consensus or outcome is agreed upon, can be jointly lived with (Sprey, 1972). Two areas of sociological research may benefit from the study of interaction patterns on the aged-parent and adult-child bond: (1) Social Public Policy: designing training programs that promote strategies that assure much better levels of social support, knowing the strategies of cooperation between elderly parents and their adult children, and generalizing to elders' interaction with other supportive members; and (2) Family Relations: relevant information will be obtained about major theoretical questions such as: How is orderly cooperation between family members possible? Family harmony is considered a problematic rather than a normal state of affairs (Sprey, 1969; 1971; 1988; 1990; 1991). Viewing the family as a process, the ability of elderly parents and adult children to negotiate becomes relevant.
II. THEORETICAL FRAMEWORK:

Intergenerational relations, in particular those relations between aged parents and their adult children, are considered as part of an ongoing family system (Broderick, 1993). Elderly parents and adult children may interact in a cooperative or competitive manner. The interesting question is to determine what interaction patterns among them lead to managing conflicts in a cooperative or competitive manner. The main thrust of this paper, is to uncover these patterned relationships of the aged parent and adult child that are indicative of conflict management. Strategic, predispositional, and interactional factors influencing the conflict resolution process among aged parents and adult children will be discussed. The study will focus on the process of managing conflicts in interactions between aged parents and adult children.

In order to implement this systemic approach, a structural analysis of games of strategy (game theory) is put forward. Game theory is a structural theoretical approach that may be used to examine the available set of strategies of cooperation and conflict between aged parent and adult child. Game theory is an empirical approach to the study of conflict resolution. This theory provides a paradigm for studying conflicts of interests, and a model for prescribing how rational decision-
making is made. This study does not focus on the normative aspect of game theory, but on the use of the so-called "mixed-motive games" or situations in which each subject has the option to compete or to cooperate with the other. Thus, the use of the main ideas, assumptions, and concepts of game theory in the present study is particularly recommended because these "mixed motive games" can provide measures of interpersonal interactions. Each subject, in order to attain mutual cooperation, must overcome not only the temptation to compete, but also must trust the other to do the same. Mixed-motive situations involves not only a conflict of interests between protagonists (intergenerational conflicts), but also a conflict within each subject (personal conflicts) concerning whether to cooperate or compete. Therefore, the basic assumptions and concepts of game theory are very much appropriate to explore the logic of decision making in social situations in which the outcomes depend upon the decisions of two autonomous subjects. Game theory provides an abstract framework for modeling these situations involving interdependent choices. Thus, this approach, as a theory of interdependent decision making, may provide relevant information to the study of family and

---

intergenerational relations, and in particular to the aged-parent and adult-children relationship.

The application of game theory as an structural approach to the study of families is also relevant with regard to the study of the family as a whole. Families are systems encompassing more than individuals. Families are primarily formed by dyads, triads, and even larger interpersonal groups. Game theory may offer an initial paradigm to research basic dyadic relations within the family.
III. GAME THEORY:

1. Description of Prisoner's Dilemma and Chicken Games:

Two-person, mixed-motive experimental gaming has focused on the simplest symmetric $2 \times 2$ games. The Prisoner's dilemma (PD), and Chicken (CHK) are the two games that have received the most attention. It must be emphasized from the beginning that "the question, to what extent Prisoner's Dilemma represents the real world, implications of attitudes towards hierarchy or of individualist or collectivist orientations and the like are not about game theory" (Rapoport, 1992). These questions do not belong to game theory, but to the behavioral sciences. The real contribution of Prisoner's Dilemma and related games to the behavioral sciences has been to generate more questions rather than to provide definitive answers. Therefore, the use of Prisoner's Dilemma and the Chicken games in this study is an attempt to explore the structure of conflict resolution between elderly parents and adult children. This research will most likely produce a better understanding of the interaction processes among them and the findings will enable us to raise new and more fundamental questions to be addressed by later research.
The two-person Prisoner's Dilemma Game is known as a mixed-motive (or non-zero sum) game because the two players have both common and conflicting interests. The game was introduced by Luce and Raiffa (1957), but the Prisoner's Dilemma nickname is derived from the anecdote reported by Albert W. Tucker (1950):

"Two suspects are taken into custody and separated. The District Attorney is certain that they are guilty of a specific crime, but he does not have adequate evidence to convict them at a trial. He points out to each prisoner that he has two alternatives: to confess to the crime the police are sure they have done, or not to confess. If they both do not confess, then the District Attorney states he will book them on some very minor trumped-up charge such as petty larceny and illegal possession of a weapon, and they would both receive minor punishments: if they both confess they will be prosecuted, but he will recommend less than the most severe sentence: but, if one confesses and the other does not, then the confessor will receive lenient treatment for turning state's evidence, whereas the latter will get "the book slapped at him."

The crucial feature of the game is that one player can gain the most by "confessing," if the other player has not "confessed," but otherwise "not confessing"
is a better strategy. A player's strategy (namely his decision to "confess" or not "confess") reflects his trust or mistrust, and his wish to cooperate or exploit the other player. The payoff matrix might look like the following:

Figure I: Prisoner's Dilemma Game

<table>
<thead>
<tr>
<th></th>
<th>PRISONER #1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NOT CONFESS</td>
</tr>
<tr>
<td>PRISONER #2</td>
<td></td>
</tr>
<tr>
<td>NOT CONFESS</td>
<td>1 YEAR (#1)</td>
</tr>
<tr>
<td></td>
<td>1 YEAR (#2)</td>
</tr>
<tr>
<td>CONFESS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 YEARS (#1)</td>
</tr>
<tr>
<td></td>
<td>3 MONTHS (#2)</td>
</tr>
</tbody>
</table>

The second game that will be used in the present study is the game of Chicken. This is a two-person game, and like the Prisoner's Dilemma, an important model for a diverse range of human conflicts. It was in the 1955 movie Rebel Without a Cause that the game of chicken came to be popular. The game consists of two teenagers simultaneously driving their cars off a cliff, jumping out at the last moment. The teenager who jumps out first is "chicken" and loses. However, it
was Bertrand Russell (1959) who recognized the game of chicken as another game-theoretic dilemma:

"It is played by choosing a long straight road with a white line down the middle and starting two very fast cars towards each other from opposite ends. Each car is expected to keep the wheels of one side on the white line. As they approach each other, mutual destruction becomes more and more imminent. If one of them swerves from the white line before the other, the other, as he passes, shouts "Chicken!" and the one who has swerved becomes an object of contempt."

The game of Chicken simulates the basic features of brinkmanship and appeasement. The dilemma occurs at the last moment: each driver has calculated his reaction time and his car's turning radius (which are assumed identical for both cars and drivers); there comes a moment of truth in which each must decide whether or not to swerve. This decision is irrevocable and must be made in ignorance of the other driver's decision. There is not time for one driver's last-minute decision to influence the other driver's decision. The way players rank outcomes in highway chicken is obvious. The worst thing (0/0) that can happen is for both players not to swerve. The best thing (3/1 or 1/3) that can happen, the
real point of the game, is to show your machismo by not swerving and letting the
other driver swerve. You survive to gloat, and the other guy is "chicken." Being
chicken is the next to worst outcome, but still better than dying. Finally, there is a
cooperative outcome in chicken. It is not so bad if both players swerve (2/2). Both
come out alive, and no one can call the other a chicken. The payoff matrix might
look like the following:

Figure II: Chicken Game

<table>
<thead>
<tr>
<th>DRIVER #2</th>
<th>SWERVE</th>
<th>DRIVE STRAIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWERVE</td>
<td>2 (#1)</td>
<td>3 (#1)</td>
</tr>
<tr>
<td></td>
<td>2 (#2)</td>
<td>1 (#2)</td>
</tr>
<tr>
<td>DRIVE STRAIGHT</td>
<td>1 (#1)</td>
<td>0 (#1)</td>
</tr>
<tr>
<td></td>
<td>3 (#2)</td>
<td>0 (#2)</td>
</tr>
</tbody>
</table>

The stories from the Prisoner's dilemma (PD) and Chicken (CHK) games
may be translated into a game which, in its basic form, is played by two persons
who are not allowed to communicate, except by the choices they make in the game.
During each trial, each player must choose between two options which, in the
literature, are traditionally labeled "C" for cooperation and "D" for competition.
The choices made by the players are simultaneous and irrevocable. The outcome payoff matrix consists of four possible combinations of choices:

Figure III: Cooperation and Defection Game

<table>
<thead>
<tr>
<th>PLAYER #2</th>
<th>PLAYER #1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(C) Cooperation</td>
<td>(C) COOPERATION</td>
<td>(D) DEFLECTION</td>
<td></td>
</tr>
<tr>
<td>C (#1)</td>
<td>C (#1)</td>
<td>D (#1)</td>
<td></td>
</tr>
<tr>
<td>C (#2)</td>
<td>C (#2)</td>
<td>D (#1)</td>
<td></td>
</tr>
<tr>
<td>(D) Defection</td>
<td>(D) DEFLECTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D (#2)</td>
<td>C (#1)</td>
<td>D (#2)</td>
<td></td>
</tr>
</tbody>
</table>

The points received by each player depend both on his own choice and the other player's choice. In a Prisoner's Dilemma situation (see figure V-VI on pp. 36) if both players choose C, then the payoff is mutually beneficial. If one player chooses C and the other D, the payoff for the player choosing D is greater than if they had both chosen C; while for the player choosing C the payoff is less than if they had both chosen C or D. Finally, if both players choose D, the payoff is less than if they had both chosen C.

The following game payoff possibilities were suggested by Rapoport and Chammah (1965), and have been adopted in the literature: "R" stands for "reward for cooperation" and it corresponds to the (CC) outcome where both players choose...
C: "T" stands for "temptation to defect," and it corresponds to the (DC) outcome for the player choosing D while the other chooses C; "S" stands for "sucker" or "saint," and it corresponds to the (CD) outcome for the player choosing C while the other chooses D; and "P" stands for "punishment," or a (DD) outcome where both players choose D.

The essential difference between the Prisoner's Dilemma and the Chicken games is in their payoff structure. In Chicken, the "sucker" payoff is greater than the "punishment" payoff (S > P); in Prisoner's Dilemma, the punishment payoff is greater than the sucker payoff (P > S). For example, in the present study, the two payoffs for the PD and CHK games (figures V-VI on pp. 36) fulfill this condition since for the CHK game sucker = -10 > punishment = -25; and in the PD game punishment = -3 > sucker = -10. The structural change between both games affects the psychological interpretation made by the players. For instance, in a prisoner's dilemma "trust" might be necessary for a cooperative outcome, and less "trust" might be required in a Chicken game. There is a transition from a trust-suspicion dimension to one of "brinkmanship," in which threats and counterthreats are foremost.

Research also indicates that greater cooperation occurs in the Prisoner's Dilemma game when increasing the number of trials. Iterated plays of the same game are the most common experiment. It produces data enough to consider what
Rapoport (1988) called the "learning factor." Players hope that by choosing cooperation they will somehow induce the partner to cooperate. What is important in iterated games is not how particular individuals play, but how a whole class of individuals plays. Interaction sequences may present more or less stable patterns. The iterated Prisoner's Dilemma differs from a one-shot dilemma on what Axelrod (1984; 1988) called the "shadow of the future." It makes sense to cooperate now in order to secure cooperation in the future. Players subjectively weigh a present advantage against possible future losses. Most experiments have involved few number of trials, but Rapoport & Chamhah (1965) had subjects play 300 or more trials with similar results.

2. Dimensions of Experimental Games:

2.1 Type of Game Structure:

Rapoport and Chamhah (1965; 1966) examined the long-term time courses of choices in both games. Their results showed that the proportion of cooperative (C) choices begin to increase slowly in frequency usually reaching a proportion in
excess of 60 per cent by trial 300. The game of Chicken tends to elicit higher proportions of (C) choices than the Prisoner's Dilemma game. This is what logic would suggest since in the Chicken game neither strategy is dominant and (C) is the safer alternative. In the Chicken game, the frequency of (C) choices exceed more than 70% after 300 trials (subjects tended to behave more cautiously, that is, to choose (C) more frequently, the worse the punishment of joint defection (DD).

Since the game structure is likely to exert an influence on the subjects' behavior (Rapoport and Chammah, 1965; 1966; Santa Barbara, 1972; Epstein and Santa Barbara, 1974), it is expected that elderly parents and adult children will be sensitive to structural aspects of the conflict situation. Therefore the first prediction for this study is:

**Hypothesis 1:** Aged parents and adult children dyads who attain a stable cooperative state will be characterized by a higher level of competitive reciprocity in a Prisoner's Dilemma game than in the Chicken game.

2.2 Response State Outcomes:

The most striking general finding in using the Prisoner's Dilemma game is the "DD lock-in outcome effect" (Flood, 1958; Scodel et al. 1959; Rapoport and Chammah, 1965; 1966). When the Prisoner's Dilemma game is repeated many
times there is a tendency for long runs of (D) choices by both players to occur. Likewise, family studies have found that many marriages and families seem to develop more or less stable patterns in their ways of dealing with each other (Reiss, 1971; Kantor and Lehr, 1976).

Previous research (Pilisuk, Potter, Rapoport, and Winter, 1965; Rapoport and Chammah, 1965; 1966; Santa Barbara, 1972; Santa Barbara and Epstein, 1974) has indicated that dyads in mixed-motive games tend to stabilize their interaction after many trials. Some dyads develop a cooperative outcome, some stabilize their interactions in a state of high competition or conflict, and others stabilize at an intermediate level. Following Pilisuk et al. (1965), dyads who attain a state of high cooperation will be referred to as "Dovcs," and those who attain a state of high conflict will be labelled "Hawks." In addition to these two groups, Santa Barbara (1972) and Santa Barbara and Epstein (1974) found that among those dyads who attained an intermediate level of conflict, some presented a dominant-submissive pattern (i.e., one member is exploited by the other in a consistent manner). In these studies, the criterion for cooperation is redefined in terms of the proportion of (CC) responses a dyad experiences (Rapoport and Chammah, 1965; Santa Barbara, 1972; Santa Barbara and Epstein, 1974). Their findings indicated that about thirty percent of dyads were classified as cooperators (CC) and competitors.

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2 The criterion for classifying dyads is fully discussed in the method section.
(DD) in the Prisoner's dilemma and Chicken game. Likewise, about twenty percent of dyads displayed a dominant-submissive response outcome, and only ten percent played mutually cooperative, competitive, or dominant-submissive from the beginning of the game. Finally almost forty percent of dyads did not reached any stable response outcome at all.

Therefore, since stable response outcomes were likely to happen, the next prediction in this study is:

**Hypothesis 2:** Aged parents and adult children dyads will attain states of stable cooperation and competition in an experimental game situation.

2.3 Strategic Interaction:

In game theory a strategy is a complete plan of action that describes what a player will do under all possible circumstances. In playing mixed-motive games, players previously using a stable strategy may also try to decide the most appropriate goals in that particular game. They also may try to influence each other to verify the efficacy of using different strategies. In other words, players may use the initial trials of the game to initiate a bargaining and conflict resolution
process. Behavioral patterns may be qualitatively different at the early stage of interaction during which players engage in a negotiating process.

The strategies in mixed-motive games of the simplest kind are either the frequency of a cooperative (C) or a competitive (D) response (see table on pp. 21). Choosing (C) allows a player to enjoy mutual cooperation or joint gain maximization. The goal of choosing (D) is to do better than his partner or to maximize his own gain (Rapoport and Chammah, 1965).

Strategies of reciprocity will provide additional relevant information about how subjects reciprocate each other's moves (see table pp.23). Overall reciprocity may be cooperative (Cn+1/Cn), or competitive (Dn+1/Dn). Cooperative reciprocity (Cn+1/Cn) indicates that one player chooses (C) after the other chose (C) in the previous trial. Competitive reciprocity (Dn+1/Dn) indicate that one player chooses (D) after the other player chose (D) in the previous trial.

However, as Rapoport and Chammah (1965) indicated, the first-order conditional probabilities are much more interesting measures of reciprocity (see table on pp. 21). These measures are concerned with the proportion of (C) responses on trial n + 1, given the occurrence of a particular response state on trial n. The authors' interpretation of these measures is: a) "trustworthiness" in that it appears to be a propensity to respond cooperatively to the other's cooperative response (Cn+1/CCn, i.e., one player responds cooperatively (C) in trial n + 1
following a cooperative joint (CC) response on the preceding trial n); b) "forgiveness" indicates a propensity to respond cooperatively to one's own cooperative choice (Cn+1/CDn, i.e., a player responds cooperatively (C) in trial n+1 following his own cooperative (C) response and the other defecting (D) choice on the preceding trial n); c) "repentance" which indicates a propensity for one player to respond cooperatively following his own defecting response (Cn+1/DCn, i.e., a player responds cooperatively (C) in trial n+1 following his own defecting (D) response and the other cooperative (C) response on the preceding trial n); and d) "trust" in that one trusts the other not to continue defecting (Cn+1/DDn, i.e., player one responds cooperatively (C) in trial n+1 following both players defecting (DD) response on the preceding play n). However, in the Chicken game, the first-order conditional probability of "forgiveness" needs to be interpreted as an "appeasing" response in that it is the fear of a (DD) outcome that prevents the player from retaliating.
Table I: Strategies

<table>
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<tr>
<th>STRATEGY</th>
<th>INTERPRETATION</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>P (C)</td>
<td>Cooperation</td>
<td>Individual cooperation</td>
</tr>
<tr>
<td>P (CC)</td>
<td>Cooperation</td>
<td>Mutual cooperation</td>
</tr>
<tr>
<td>Cn+1/Cn</td>
<td>Cooperative Reciprocity</td>
<td>Player 1 plays a cooperative (C) choice at trial Cn+1 after player 2 chose (C) at trial n</td>
</tr>
<tr>
<td>Dn+1/Dn</td>
<td>Competitive Reciprocity</td>
<td>Player 1 plays a competitive (D) choice at trial n+1 after player 2's chose (D) at trial n</td>
</tr>
<tr>
<td>Cn+1/CCn</td>
<td>Trustworthiness</td>
<td>Player 1 plays cooperatively (C) on trial n+1 following both players cooperative (CC) response on previous trial n</td>
</tr>
<tr>
<td>Cn+1/CDn</td>
<td>Forgiveness (PD) Appeasing (CHK)</td>
<td>Player 1 plays cooperatively (C) on trial n+1 following his own cooperative (C) response and player 2's defecting (D) response on previous trial n</td>
</tr>
<tr>
<td>Cn+1/DCn</td>
<td>Repentance</td>
<td>Player 1 plays cooperatively (C) on trial n+1 following his own defecting (D) response and player 2's cooperative (C) response on previous trial n</td>
</tr>
<tr>
<td>Cn+1/DDn</td>
<td>Trust</td>
<td>Player 1 plays cooperatively (C) on trial n+1 following both player's defecting (DD) response on previous trial n</td>
</tr>
<tr>
<td>PC - PC</td>
<td>Cooperative Intention</td>
<td>Player 1 plays cooperatively (C) and predicts that player 2 will cooperate (C) as well</td>
</tr>
<tr>
<td>PC - PD</td>
<td>Exploitive Intention</td>
<td>Player 1 plays cooperatively (C) and predicts that player 2 will defect (D)</td>
</tr>
<tr>
<td>PD - PC</td>
<td>Apprehensive Intention</td>
<td>Player 1 plays a competitive (D) choice and predicts that player 2 will cooperate (C)</td>
</tr>
<tr>
<td>PD - PD</td>
<td>Defensive or Punitive Intention</td>
<td>Player 1 plays a competitive (D) choice and predicts that player 2 will defect (D) as well</td>
</tr>
</tbody>
</table>
The notion of the "cautious trust" strategy consists of a cooperative signaling (high level of trustworthiness), and a firmness component (competitive reciprocity responses). The interaction pattern that characterizes the "Doves" has been labelled as a "cautious trust" strategy (Santa Barbara, 1972). In order for cooperative dyads to develop a "cautious trust strategy," they may indicate higher levels of trustworthiness and competitive reciprocity than the other non-cooperative dyads. The effects of this strategy are expected to be different when the structure of the conflict varies (Oskamp, 1970; Santa Barbara and Epstein, 1974). In other words, in the game of Chicken, competitive (D) choices are much less frequent due to the high loses that a competitive (DD) outcome involves (in this study, -25, -25). The firmness reciprocity component of a "cautious trust strategy" is expected to be at lower levels than in the Prisoner's dilemma game (in this study, -3, -3). Competitive reciprocity, as indicated, is expected to be higher in the Prisoner's dilemma game.

The factors that will keep aged parents and adult children effectively interdependent will be their ability and motivation to negotiate in a cooperative manner. Thus, the focus is on the process of strategic resolution, regardless of the frequency, magnitude or content of their differences. Reactive dispositions (or strategies), rather than individual predispositions may be primarily responsible for stable cooperation or competition. Aged parents and their adult children may use
the initial trials of the game in order to initiate a bargaining and conflict resolution process. Therefore, the strategic prediction for cooperative dyads is that:

**Hypothesis 3:** Cooperative aged parents and adult children dyads will be characterized by a cautious trust strategy.

2.4. Attributional Processes:

The following set of variables are concerned with individuals perceptions of each other while engaged in a game situation. Interpersonal perception is a social psychological dimension that, if incorporated in the structure of games of strategy, may serve as an important variable in clarifying the reasons for a particular choice. For example, when a member perceives that his partner is likely to cooperate in a trial, the (D) choice will be an exploitative move. But it will be regarded as a defensive move if he perceives his partner likely to compete. Interpersonal perception data is obtained by requiring each player to predict his opponent's choice on each trial. There are four predict-play combinations (see table on pp. 21): cooperative intentions (predict C-play C); exploitive intentions (predict C-play D); apprehensive or suspicious intentions (predict D-play C); and defensive or punitive
intentions (predict D-play D). These measures are similar in meaning to the first-order conditional probabilities.

Kelley and Stahelski (1970), found empirical evidence in support of the assumption that cooperative and competitive people hold widely different world views. According to Kelly and Stahelski (1970), competitive people would have a cynical and authoritarian attitude, and cooperative people would have a more realistic appreciation of the diversity of humans.

Research indicates that subjects in conflict tend to perceive each other differently than they perceive themselves (Allport, 1958; Deutsch, 1969). These perceptions, may relate to the manner in which they interact. Epstein & Santa Barbara (1975), found that couples who resolved conflict in a cooperative manner perceived each other as cooperative and themselves expressed more appeasing intention; and competitive dyads perceived each other as competitive and themselves at a higher level of exploitative and defensive intentions than other dyads. Therefore, regarding attributional effects it can be predicted that:

**Hypothesis 4:** Aged parents and adult children dyads who attain a stable outcome of cooperation will perceive each other as being more cooperative and express more cooperative intentions than non-cooperative dyads.
2.5 Predispositional Factors: Gender:

Contrary to belief of the female traditional role as being more cooperative than males, early experiments using both Prisoner's Dilemma and Chicken games found that there was an apparent tendency for females to exhibit lower frequency of (C) choices than males (Rapoport and Chammah, 1965; 1966). Although there have been many other studies replicating these findings on gender difference in mixed-motive games, there were other studies that have found no significant differences (Kanouse and Wiest, 1967), and still others have found greater frequencies of (C) choices among males (Tedeschi, Bonoma, and Novinson, 1970). The most plausible hypothesis suggested by Colman (1982) is that a stronger feeling of "evaluation apprehension" in male experimenters is induced in female than in male players. If the game is perceived by subjects as a test of intelligence between players, then women may play defecting (D) choices more frequently than men in order to rule out the possibility of loosing the competition. Colman (1982) conjectures that "in certain circumstances women would be more anxious than men to avoid appearing foolish in comparison with their opponents."

Based on these findings from experimental gaming research, it is not clear whether gender differences are to be expected. However, research on the social network of the elderly shows again and again the prominent role that the mother-
daughter dyad occupies on the provision of care (Brody, 1985; Riley and Riley, 1986). Women are the principal caregiver (daughter and/or spouse), and therefore, the mother-daughter bond may convey a distinctive cooperative character. Research in family communication and conflict also indicates that wives tend to build a climate of agreement (Rubin, 1984), and that daughters and mothers are the most active members in closing conflicts (Vuchinich, 1987). Finally, there are some studies on sex differences regarding competitive and cooperative attitudes in competitive cultures (Spence and Helmreich, 1983). Competition would be concentrate in men, and cooperation in women. Thus, the following prediction may be formulated:

**Hypothesis 5:** Aged parents and adult children dyads whose members are females will be more cooperative than those dyads whose members are males.

2.6 Personality Factors: Authoritarianism:

A few personal predispositions and/or personality characteristics have been found to be relevant in a game situation. Terhune (1968) has suggested that the direct effects of personality are inconsequential compared to more complex
interactional effects. Previous research indicates that "authoritarianism," as measured by the California F-scale (Adorno et al. 1950), is one of the few personality variables associated with measures of cooperation and conflict (Terhure, 1970; Kelley and Stahelski, 1970; Rapoport, Guyer, Gordon, 1976). Authoritarian individuals (higher F-scores) are associated with low levels of cooperation. Specifically, authoritarian people favor more strict child rearing practices than those who rate low on the California F-scale; they tend to be more prejudiced against ethnic or cultural minorities, and less liberal in their political views. Similarly, authoritarian people would manifest more suspicious and untrustworthy behavior than those who rate low on the scale. The latter being more trusting and trustworthy (Terhure, 1970).

Cooperative and/or competitive dyads may hold widely different world views (Kelly & Stahelski. 1970), yet family relations are based upon a hierarchical structure where parents, in particular fathers, are invested with authority. Therefore, it is likely that authoritarian attitudes and modes of conflict managing will be associated. Authoritarian aged parents would tend to be more competitive than their adult children. Therefore, regarding personality dimensions, it can be predicted that:
Hypothesis 6: Aged parents and adult children dyads who attain a stable cooperative state will tend to be less authoritarian than aged parents and adult children dyads who attain a stable competitive state (i.e., higher scores in the California F-scale).

2.7 Psychological Factors: Self-Concept

Psychological factors may also mediate the structure of conflict resolution. This study attempts to examine the relation between individual's self-concept and their cooperative intentions. Recent research findings suggested that "we compete to overcome fundamental doubts about our capabilities and, finally to compensate for low self-esteem." (Kohn, 1992). The argument is that competition boils down to self-esteem. From a review of findings, David and Johnson (1989) indicated that "cooperative learning situations, compared with competitive and individualistic situations, promote higher levels of self-esteem." They suggested that cooperativeness is positively related to self-concept and internal locus of control among other indexes of psychological health. Therefore, the following prediction can be formulated:
Hypothesis 7: Aged parents and adult children dyads who indicate a high level of self-esteem will tend to be more cooperative in a gaming situation.

2.8 Intergenerational Solidarity Factors:

Intergenerational solidarity and family structure have been found to influence the aged parent and adult child relationship (Mangen, & Bengtson, & Landry, 1988). Studies indicate that associational solidarity (frequency and type of interactions), affectual solidarity (quality of interaction), consensual solidarity (extent of agreement in values), functional solidarity (exchange of tangible goods), and normative solidarity (norms, or family expectations) between aged parents and adult children appear to be of particular salience (Bengtson, Olander, & Haddad, 1976; Olson, Russell and Sprenkle, 1983) for the analysis of patterns of interaction within families. Parents' and childrens' supportive exchange patterns represent the well-being of the family. Research on reciprocity among family members indicates that the quality and durability of family relations in part stems from the functions that the family fulfills for their dependent members (Mancini and Blieszner, 1986).

This study attempts to examine the relationship between intergenerational
relations and the different response state strategies of conflict resolution. In particular, intergenerational interaction, intergenerational exchange, intergenerational norms, and affectual solidarity dimensions, are expected to be associated with cooperative or competitive managing strategies. The dimensions of solidarity are measured using Mangen, Bengtson, and Landry (1988) measurement instruments. Cooperative dyads are expected to present higher levels of intergenerational solidarity than dyads who manage their conflicts in a non-cooperative response pattern. Thus, the following prediction is formulated:

Hypothesis 8: Aged parents and adult children dyads who indicate a high level of solidarity will tend to be more cooperative in a gaming situation.
IV. RESEARCH DESIGN:

1. Method

The data were collected from a convenience sample of aged-parents and adult-children individuals living in the city of Cleveland, Ohio. The choice of a convenience sample was based on two reasons: first, this study is aimed to explore intergenerational patterns of interaction, and it does not seek to establish definite causal relations, origins or consequences of the process of cooperation; and second, the time and resources in order to obtain a random sample of aged parents and adult children for this study were not available.

Subjects' participation was considered on the basis of meeting the following criteria: a) their age, b) the availability for "joint" participation of the couple, and c) the condition of being in relatively good health (defined as able to participate in a two-hour game, and free from any major physical impairments). Subjects included a) a parent, either the father or the mother, over 50 years old; and b) a child, either the son or the daughter, over 25 years old. In total one hundred and thirteen dyads participated in the study. Subjects were reached or contacted for voluntary participation through the Alumni and Parent Relations Association at Case
Western Reserve University (CWRU), local parishes, and by advertising in local newspapers. In particular, a letter inviting them to participate in the study was mailed to approximately 3,000 CWRU alumni and emeriti faculty. Written consent from participants was obtained (Appendix B).

In general, research shows that monetary incentives may affect behavior in either game in a relevant manner (Gallo and McClintok, 1965; Oskamp and Kleinke, 1970). In particular, large monetary incentives might generate higher levels of cooperation. However, as Colman (1982) indicated, monetary incentives do not affect behavior in a pronounced consistent manner, and furthermore, these effects are most likely to interact with other unknown factors when playing the Prisoner's dilemma and Chicken game.

In this study, subjects were paid $10.00 as a compensation. In addition, previous to their participation, couples were informed that the number of points they accrued would be considered for a final award (several cash awards were given to the players who scored the highest).

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3 Appendix A shows one of the adds used to contact couples.
2. Apparatus:

The apparatus consist of two cubicle-like partitions that separate the subjects. Each subject sat facing a panel which contains a payoff display in matrix format. This is a 2 x 2 matrix made of plexiglass with the payoffs printed in each cell. The payoffs for each player were displayed in full to both players. The payoff to a particular player was printed in large type in each cell, and the other player's payoff appeared in small type in each cell.

A light behind each cell indicated the outcome on each trial. There were two sets of response buttons located below the panel displaying the payoff matrix. To make a response, the subject pressed one of the buttons aligned with the row (or column) of his choice. A trial began with the sound of a buzzer. Subjects predicted their partner's intention to play, and then made their actual choices. Subjects were required to respond within six seconds of this buzzer, after which the appropriate cell lit up, determined by the intersection of row and column player's choices. This cell remained lit for three seconds, after which there was a one-second pause, then the buzzer signaled the next trial.
The experimenter was in the same room with the subjects. The experimenter's function was to distribute and have the subjects complete the questionnaire on sociodemographics and intergenerational variables, to explain the instructions, and to monitor a personal computer where the subjects' outcomes in each trial during the game was being automatically recorded in the form of an ASCII text data file.
3. Instructions:

The experimenter informed the subjects about the mechanics and purpose of the game, and he did not proceed to the experimental gaming until after both participants indicated that they understood the instructions for the game (Appendix C). Finally, subjects were strongly warned that they should not attempt to communicate with each other by talking, laughing, or in any way indicating how they were feeling about what was happening. The experimenter pointed out to both subjects that their objective in this situation was to win as many points as possible, emphasizing the idea of individual (not team) scores. Instructions may induce the players to play in an individualistic, cooperative, or competitive manner; however, as Rapoport, Guyer and Gordon (1976) reported from their studies, instructions make little difference in playing these games. As they demonstrated, even if the instructions have a subtle impact on players at the outset, the effect will not survive beyond the first few trials.
4. Experimental Structures:

Two experimental conflict and cooperation games, "Prisoner's Dilemma" and "Chicken," were used as the experimental situations.

**Figure V: PRISONER'S DILEMMA GAME**

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<th>COLUMN</th>
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<td>C</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>PLAYER</td>
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<tr>
<td>D</td>
<td>-10</td>
<td>-3</td>
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</table>

**Figure VI: THE CHICKEN GAME**

<table>
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<td>PLAYER</td>
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<td></td>
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<tr>
<td>D</td>
<td>-10</td>
<td>-25</td>
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</table>
5. Procedure:

When subjects arrived, they were seated in one of the cubicles. The experimenter remained in the same room as the subjects. Prior to each game, subjects filled out a questionnaire about his or her personal, familial and relational characteristics (Appendix D). After random assignment of the player number (Row or Column player) and the matrix structure (Prisoner's Dilemma or Chicken game), the experimenter read the instructions to the subjects. They also had a printed copy of the instructions, and each was asked to read along as the experimenter read the instructions aloud. They were informed about how to play the game, the purpose of it, and the cash awards to be assigned to the ten subjects who received the highest scores (one of one hundred dollars; two of seventy dollars; three of fifty dollars; and four of twenty five dollars for each game). Individual instructions and orientations to play were given in order to emphasize the competitive component of the game situation. In other words, since the temptation to collude or agree upon mutual behavior was expected to be relevant for parent-child dyads, individual orientations and incentives were stressed.

Before starting the game, subjects were allowed to ask questions. There was a rehearsal, ten sample trials in order to make sure that each subject understood correctly the mechanics of the game. When both subjects were ready,
the experimenter indicated the beginning of the trials. Subjects were not allowed to communicate to each other. After each 25 trial block, subjects were given a break in order to add up their gains or losses. At the end of the 300 trials, the subjects gave their score sheets to the experimenter.

After completing the session, the experimenter asked the subjects to answer a brief follow-up questionnaire about their attitudes and intentions while playing the game (Appendix E). The purpose of this was to double-check the subjects' understanding of the instructions of the game. In general, subjects reported that the instructions given by the experimenter were clear and that they understood them.

One hundred and thirteen aged parents and their adult children were interviewed at Case Western Reserve University during the Spring of 1993. However, not all of them were considered for the analysis. Three dyads decided not to complete the experiment. Another ten dyads admitted not having understood either the purpose or the mechanics of the game. And finally, seventeen dyads reached a stable outcome in the very first block of 25 trials. This mutual response outcome from the beginning of the game made impossible the inclusion of these dyads in the analysis due to the absence of interactive patterns.
6. Criteria

In order to classify dyads into different groups, it was necessary to define clearly the criterion of cooperation, conflict, dominant-submissive, and other category groups. The particular value in this study was primarily determined by the levels of cooperation and conflict observed in other studies (Rapoport and Chammah, 1965; Santa Barbara, 1972; Santa Barbara and Epstein, 1974). The criterion for cooperation was redefined in terms of the proportion of (CC) response states a dyad experiences. The first twenty out of 25 (CC) response states for at least three consecutive 25-trial blocks in a run of 300 trials, is the criterion for high cooperation. Dyads would be classified in each response state based on their first three-blocks of 25 criterion trials. The first set of 25 trials with 20/25 (CC) response states will be considered the first response state block. Because of the high losses involved in competitive (D) responses, dyads are expected to engage in mutually competitive (DD) response state less frequently than in mutually cooperative (CC) choices, in particular when playing the Chicken game. Therefore, the criterion for the conflict group was set at 12/25 (DD) for at least three consecutive 25-trial blocks. Similar criteria was used for the dominant-submissive group, i.e., that one member receive at least 12/25 (CD) for at least three consecutive 25-trial blocks.
7. Data Organization

The data in this study include survey data, and experimental data. Regarding survey data, self-written questionnaires were used to collect information on the subjects' sociodemographics, social, and psychological characteristics. The following are the measures of intergenerational solidarity dimensions that were included:

a) The Affectual Solidarity Scale (Bengtson, 1973). This construct refers to the nature and extent of positive sentiments toward other members in the family. This is a ten-item scale about mutual parent and child affect. It is a six points Likert-type scale ranging from "not much" to "extremely well." The instrument assesses five dimensions: understanding, fairness, trust, respect, and affection. Formal test of validity and reliability have been conducted by Bengtson (1973), and by Mangen, Bengtson, and Landry (1988). The instruments showed high internal consistency and validity. In this sample of parents and adult children the Cronbach's Alpha reliability coefficient for this instrument was 0.924.

\[1\] All scales presented reliability coefficients at desirable levels, that is, equal or greater than 0.70 (Nunnally, 1978).
b) The Generational Communication and Closeness items (Bengston, 1973). This is a three-item instrument asking about the quality of parent-child relationship. They reflect the degree of communication among family members, similarity, getting together and the general closeness of the relationship. The items measure in a reliable manner as well, and use of these indicators constitutes an appropriate option if space or a global assessment is needed (Mangen, Bengtson, Landry, 1988). It is measured using a six point Likert-type scale ranging from "not well" to "extremely well." The Cronbach's Alpha reliability coefficient for the combination of the three items was 0.87.

c) The Intergenerational Exchange items (functional solidarity, Bengtson, 1988). This is a two item instrument using an eight point Likert-type scale asking how often parent and child do things together. They measure the degree of service assistance. The frequency of exchange of services within family members has been found a valuable indicator for describing intergenerational relations (Mangen, Bengtson, Landry, 1988). Response values range from "almost never" to "almost every day." The Cronbach's Alpha reliability coefficient for this two-items was 0.82.

d) The Intergenerational Norms Scale (Heller, 1970). Family norms are those standards of behavior that govern and mediate intrafamilial interactions and expectations of family as a social system (Mangen, Bengtson, Landry, 1988). As
part of the concept of family solidarity, normative solidarity is viewed as the degree of intergenerational consensus with regard to filial responsibility. The scale is a ten item scale about normative aspects of family relations. Values represent a four point Likert-type scale ranging from "strongly disagree" to "strongly agree." Mangen, Bengston and Landrey (1988) suggested that this measure still is in need of future refinements in order to reduce ambiguity and maximize face validity. The Cronbach's Alpha reliability coefficient for this instrument in this sample was 0.67.

Personality and Psychological factors included two well known and widely used instruments in social sciences:

a) The Authoritarian Personality or The California F-Scale (Form 45 and 40) by T. Adorno et al., (1950). This is a thirty items instrument in a six point Likert-type scale. Values range from "disagree strongly" to "agree strongly." Cronbach's Alpha reliability coefficient for this instrument was 0.89.

b) The Self-Concept Scale (Rosenberg, 1965). This is a ten item self-esteem scale using a four points Likert-type scale. Values range from "strongly agree" to "strongly disagree." Cronbach's Alpha reliability coefficient for this instrument was 0.86.

The experimental gaming data were organized in the same way as previous research using the Prisoner's dilemma and Chicken games (Rapoport & Chammah,
1965; 1966; Santa Barbara, 1972; Kelly & Stahelski, 1970; Epstein & Santa Barbara, 1975). In particular, transformation of the experimental data was necessary in order to classify dyads and to compare strategic interactions across different groups. Thus, using the established criterion for stable response states of cooperation and conflict, I clearly separated the data into Preasymptote and Asymptote. Figure VII (pp. 44) indicates that trials previous to the criterion (three blocks of twenty five trials) is considered the preasymptote data (in this example from trial 0 to trial number 99). Asymptote data includes the three criterion blocks of twenty five trials (from trial 100 to 175). Therefore, the data is considered preasymptote and asymptote. The former includes only the pre-criterion data (0-99). The later includes the criterion data (100-175). Finally, post-criterion trials includes trials after the criterion blocks, up to the end of the game (300 trials).

Analysis of (CC), (CD), (DC), and (DD) criterion was conducted in order to classify dyads as cooperators, competitors, dominant-submissive or any other groups. The name of "preasymptote data" is used to refer to data before subjects reached the criterion established for their classification in any of the groups. Criterion and post-criterion data refers to data including the trials at which subjects reached the criteria of stable response outcome group. When dyads reached the criterion in the last seventy five trials (at trial 225), the criterion and post-criterion data is the same, that is 300 trials.
Figure VII: Type of Data

Type of Data: Preasymptote and Asymptote Data
CHK Game: Score Dyad 112

- Pre-Criterion Data = Trial 0 to 99 (Preasymptote Data)
- Criterion Data = Trial 100 to 175 (Asymptote Data)
- Post-Criterion Data = Trial 176 to 300
Analysis of preasymptote data was conducted in the same manner as
previous research in experimental games, i.e., normalization of the data was
necessary. Due to the expected different number of trials for each dyad to reach
the criteria for being classified as a stable response outcome group, normalization
of the preasymptote data was accomplished using Vincent sixths (Woodworth,
1961). The Vincent sixths were computed as follow: along the base line, the initial
trial is number zero, and the number of subsequent trials to the attainment of the
criterion is called 100 percent, whatever the actual number maybe for any dyad.
Each dyad number of trials to criterion was then divided by six. Then, the
percentage on each strategic variable for the number of trials at each Vincent sixth
was computed.

Analysis was based on the percentage of each strategic variable (see table I
in pp. 21) at the different Vincent sixths. The hypotheses were tested analyzing the
values of the proportion of overall cooperation (P(C)), cooperative reciprocity
(Cn+1/Cn), competitive reciprocity (Dn+1/Cn), first-order conditional
probabilities ("trustworthiness" Cn+1/CCn; "exploitive" Cn+1/DCn; "forgiveness"
Cn+1/CDn; "trust" Cn+1/DD), and predict-play combinations ("cooperative"
intentions (PC-PC); "exploitive" intentions (PC-PD); "apprehensive" intentions
(PD-PC); "defensive" intentions (PD-PD)).
Analysis of the strategic structure (types of games) was examined with an analysis of variance of proportion of (C) cooperative responses for stable response outcome groups, type of game and number of trials (Vincent sixths).

The design for the analysis includes a two factor analysis of variance for outcome group response state, and type of game over the strategic variables. Analysis of covariates included: gender and family role factor (parents or children). Finally, analysis of variance with repeated measures were used for the trials factor. The levels for the number of trials factor was reduced to eight: the Vincent preasymtote sixths, one additional for the criterion data (last trial of the seventy five trials to criterion), and finally the post-criterion data (trial 300). Analysis of variance of the intergenerational solidarity dimensions, the self-concept, and the authoritarian personality scale by outcome response state was conducted. Group post-hoc comparisons were estimated using the Student-Newman Keuls test (Huck, Cormier, and Bounds, 1974).
V. DATA ANALYSIS:

1. Sociodemographic Characteristics:

The final sample (Table VIII, pp. 48) includes data from eighty two pairs of aged parents and their adult children. Almost eighty per cent considered themselves as being part of the American middle class, men represented less than one third of the sample, and more than two thirds of the sample were white. The average educational attainment for the participants was at the level of college, though the group of adult children reported higher level of formal education than their parents (twenty nine percent of parents and fifty two percent of their children reported a college education, respectively). The majority of participants were married and living with a spouse (husband) (fifty six percent). Only a very small percentage stated that they lived alone (thirteen percent). Subjects' self-reported religious affiliation indicated that the sample included a higher percentage of Catholics (forty two percent) than Protestants (twenty seven percent), which is not the case for the American population where Protestants are about sixty percent and Catholics twenty percent.
Table II: Sociodemographic Characteristics of the Sample

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER’S DILEMMA</th>
<th>CHICKEN DILEMMA</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parents</td>
<td>Children</td>
<td>Parents</td>
</tr>
<tr>
<td>Sex (M)</td>
<td>9</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>(F)</td>
<td>34</td>
<td>31</td>
<td>32</td>
</tr>
<tr>
<td>Age (M)</td>
<td>66</td>
<td>31</td>
<td>62</td>
</tr>
<tr>
<td>(F)</td>
<td>60</td>
<td>34</td>
<td>61</td>
</tr>
<tr>
<td>Married</td>
<td>32</td>
<td>16</td>
<td>26</td>
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<tr>
<td>Widowed</td>
<td>4</td>
<td>-</td>
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</tr>
<tr>
<td>Divorced</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Single</td>
<td>1</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>Whites</td>
<td>40</td>
<td>40</td>
<td>32</td>
</tr>
<tr>
<td>Blacks</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Hispanics</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Catholics</td>
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<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Protest</td>
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<td>8</td>
<td>14</td>
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<tr>
<td>Jews</td>
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<td>5</td>
<td>3</td>
</tr>
<tr>
<td>None</td>
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<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>High S.</td>
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<td>M.A./PhD</td>
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<td>Middle</td>
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<tr>
<td>Alone</td>
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<td>5</td>
<td>6</td>
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<td>Espouse</td>
<td>31</td>
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</tr>
<tr>
<td>Other</td>
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<td>22</td>
<td>7</td>
</tr>
<tr>
<td>F - S</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>F - D</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>M - S</td>
<td>9</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>M - D</td>
<td>25</td>
<td>26</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>39</td>
<td>82</td>
</tr>
</tbody>
</table>
Finally, there was a small number of participants who were retired (twenty percent). The mean age for the parents is 61 for females and 64 for males.

The mother-daughter type of dyad represented two thirds (N=fifty one) of the dyads who participated in the study. Although special care and effort was made to collect data from father-son pairs, only six father-son dyads were interviewed. Finally, a similar number of mother-son (fifteen), and father-daughter dyads (twelve) were involved in the experiments.

2. Stable Outcome Groups:

The distribution of aged parents and adult children dyads into the stable outcomes is presented in Table III (pp. 50). Dyads who reached the cooperative (Dove), competitive (Hawks), or dominant-submissive (Dom-Subm) criterion within the first block of trials of play are not included since they had no preasymptote data to analyze regarding their interaction patterns. Dyads were classified into different response state outcomes.
Table III: Type of Dyad based on Asymptote Data by Game:

<table>
<thead>
<tr>
<th>Response State Outcome</th>
<th>Prisoner's Dilemma</th>
<th>Chicken Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperators (Doves)</td>
<td>9 (22%)</td>
<td>12 (28%)</td>
</tr>
<tr>
<td>Competitors (Hawks)</td>
<td>19 (47%)</td>
<td>4 (9%)</td>
</tr>
<tr>
<td>Dominant-Submissive (Dom-Subm)</td>
<td>7 (17%)</td>
<td>14 (33%)</td>
</tr>
<tr>
<td>Sneakers (Mug-Wump)</td>
<td>5 (12%)</td>
<td>12 (28%)</td>
</tr>
<tr>
<td>Total</td>
<td>40 (49%)</td>
<td>42 (51%)</td>
</tr>
<tr>
<td>Total dyads</td>
<td>82</td>
<td></td>
</tr>
</tbody>
</table>

Although the classification of dyads into each outcome response state is similar to previous distributions from research in game theory and family interactions (Santa Barbara and Epstein, 1974), some differences can be noticed.

First, the sample of aged parents and adult children was sensitive to the type of conflict or game structure. The structure of the game (Prisoner's or Chicken) made a significant difference regarding the frequency of distribution of dyads into each of them. The obtained Chi-Square = 24.9, with df = 3, was significant at p < .001 level. This is consistent with previous research using the same games.
(Epstein an Santa Barbara, 1974), however, the sample of aged parents and adult children was much more sensitive to the type of game than other samples from different populations. The number of dyads who were classified as competitors (Hawks) under the Chicken game was much lower among the aged parents and adult children sample, less than one percent (N=42), than among students, twenty five percent (N=38), or married couples, one percent (N=94). (Santa Barbara and Epstein. 1972, 1974).

Second, previous research classifies dyads who do not present any descriptive stable pattern during the game as "Mug-Wump." However, in this study, after examination of this group of dyads, aged parents and adult children who did not reach the established criteria, appeared to share a distinctive pattern. In particular, these dyads seemed to be willing to cooperate but they had not reached the criteria for being classified as Doves. Their cooperative intentions were followed by a few scattered competitive choices. In other words, in their process to cooperate they chose to play (C) along with some (D) choices. It is my view that the purpose of this behavior was to cooperate and to share mutual gains along with the attempt to get ones' own gain at the other's expense. It was this type of "sneaking" pattern that suggested the name of "Sneakers" for this group of dyads, as more appropriate than "Mug-Wump." Therefore, although they did not
reached the established criteria, I included them as an outcome state group along with the Doves, Hawks, and dominant-submissives "Dom-Subm."

The state interactive patterns can be depicted in a geometric form, based on the progression of the participants' scores at different trials. Although the number of points each subject accrued during the game might come from different combinations of choices, in general, the resulting diagrams show in a very clear fashion the reactive dispositions of both participants, and the changes they made during their performance in the game. Strategies and the emergence of patterns can be easily recognized for the Dove, Hawk, Dom-Subm, and Sneaker groups (Figure VIII-XI (pp. 53-54) shows a diagram for each type of state outcome). In this figure dyad number 50 was considered an example of a competitor dyad or Hawk. Daughter and mother in this dyad reached the criteria for being considered Hawks at trial number 100. This was considered the first trial for the three criterion blocks of trials (up to trial number 175). Finally, they continued defecting each other up to the end of the game (trial 300).
Figures VIII-IX:

PD Game: Score Dyad 5

![Graph of PD Game: Score Dyad 5]

- Player 1 (Daughter)  
- Player 2 (Mother)

ID 9 = Player 1; ID 10 = Player 2

CHK Game: Score Dyad 50

![Graph of CHK Game: Score Dyad 50]

- Player 1 (Daughter)  
- Player 2 (Mother)

ID 99 = Player 1; ID 100 = Player 2
Figures X-XI:

**CHK Game: Score Dyad 19**

![ CHK Game: Score Dyad 19 Diagram ]

- Player 1 (Mother) + Player 2 (Son)

ID 37 = Player 1; ID 38 = Player 2

**PD Game: Score Dyad 54**

![ PD Game: Score Dyad 54 Diagram ]

- Player 1 (Daughter) + Player 2 (Mother)

ID 107 = Player 1; ID 108 = Player 2
Their final score based on the Chicken game was one of the lowest (beyond five thousand negative points for the daughter and three thousand negative points for the mother). Dyad number 5 on the contrary, were classified as cooperators or Doves. They reached the criteria at trial number 150. Dyad number 19 was classified as Dom-Subm. Mother and son reached the criterion at trial number 175. After that, the mother dominated the game score up to the end of the game. Dyad number 54 did not reach the criteria to be classified as Doves, however, they were cooperating for most of the game. They were considered Sneakers.

After carefully examination of the data and based on the criteria established for the classification of dyads, it appeared that: a) twenty one dyads stabilized as Doves, b) twenty three dyads stabilized as Hawks, c) twenty one dyads stabilized as Dom-Subm, and d) seventeen dyads as Sneakers (they did not reach the criteria for being classified in one of the other groups). The group of cooperators (Doves) needed an average number of trials to criterion of 109; competitors (Hawks) stabilized at 110 trials, and the dominant-submissive (Dom-Subm) needed up to 131. Although all of them needed more trials to reach the criterion in the Prisoner's Dilemma than the Chicken game, no statistically significant difference for the number of trials to criterion was found. The group of Sneakers, since they did not reach the established criteria, was arbitrarily assigned an average number of trials to criterion of 150. This is the same criteria that previous research used to
analyze the group of dyads who did not reach the established criterion. However, analysis of the number of trials per game for each response state outcome group indicated a significant difference for the game structure. The obtained Chi-Square = 99.8, with df=44, was significant at p < .001 level.

3. Strategic Interactions:

Results from the analysis of the strategic variables are presented in this section. The relationship between the two independent variables, i.e., the type of game (Prisoner's Dilemma vs. Chicken), and the state response outcome group (Doves, Hawks, Dom-Subm, Sneakers), and the dependent strategic variables is analyzed. Dependent variables include individual cooperative (C) or competitive (D) responses, overall reciprocity, and the reactive conditional dispositions (trust, trustworthiness, forgiveness, repentance). The analyses are conducted on preasymptote data and collapsed over sex and type of game.
3.1 Cooperative Individual (C) Responses:

The proportion of individual cooperative (C) responses over preasymptote data (Vincent sixths) for each type of game, and outcome response state was tested using a two factors analysis of variance. Results indicated a significant effect for type of game ($F = 5.6; \text{df} = 1; p < .019$), and outcome response state ($F = 7.1; \text{df} = 3; p < .000$). The level of cooperative (C) choices was higher for the Chicken game (mean = 0.64; $p < .05$) than for the Prisoner's dilemma (mean = 0.45; $p < .05$). Furthermore, individuals comparisons using the Student-Newman-Keuls test indicated that the mean differences between the group of Hawks and all the others is large enough to be significant ($p < .05$). The Dom-Subm group indicated a significant difference ($p < .05$) with the Doves. No other differences were significant.

Two covariates (gender and family role group, i.e., aged parents and adult children) were included in the model, however, results indicated that males and females, aged parents and adult children, made similar levels of cooperative (C) choices prior to reaching the criterion trials. Analysis of variance of cooperative (C) choices with repeated measures on trials (trials=6 Vincent sixths) indicated no significant effect over preasymptote data.
Table IV: Proportion of Cooperation (C) by Game, Outcome Group and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vincent Sixths</td>
<td>Criterion</td>
</tr>
<tr>
<td>DOVES</td>
<td>.53</td>
<td>.67</td>
</tr>
<tr>
<td>HAWKS</td>
<td>.41</td>
<td>.33</td>
</tr>
<tr>
<td>DOM-SUBM</td>
<td>.44</td>
<td>.44</td>
</tr>
<tr>
<td>SNEAKERS</td>
<td>.55</td>
<td>.60</td>
</tr>
<tr>
<td>MEAN</td>
<td>.48</td>
<td>.51</td>
</tr>
</tbody>
</table>

Individual mean group comparisons were made using the Student-Newman-Keuls test. It indicated that cooperation measured by the percentage of (C) choices collapsed over game and preasymptote data (Vincent sixths), is higher for Doves and Sneakers than the Dom-Subm and Hawks (alpha value p < .05). Although these results are consistent with the criterion established for the classification of dyads. (i.e., Doves were supposed to play more (C) choices than Hawks), this criteria is only for the three blocks of twenty five criteria trials, and not for the preasymptote data. In other words, aged parents and adult children may present different interaction patterns before they reach the response cooperative state. As it was suggested earlier, interactions at the beginning of the bargaining or managing process (initial trials) may be different from the final stable response outcome (criterion trials).
3.2 Cooperative (CC) and Competitive (DD) Joint Responses:

Response state interactions offer interactive measures of cooperation that attempt to capture the resolution of interdependent situations. Therefore, the analysis of the frequency and percentage of joint cooperative (CC) and competitive (DD) outcomes seems more appropriate, since both subjects agreed upon the resolution of the mixed-motive situation. The analysis of aged parents and adult children who reached response state outcomes is presented below (Figures XII-XV, pp. 60-61). Cooperative (CC) and competitive (DD) outcomes are depicted for the four groups over preasymptote data (Vincent sixths), criterion and post-criterion data.
Figures XII-XIII:

**Prisoner's Dilemma**

Percentage (CC) Response States

0 = Five First Trials  
1-6 = Preasymptote Data (Vincent Sixths)  
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)

**Chicken Game**

Percentage of (CC) Response States

0 = Five First Trials  
1-6 = Preasymptote Data (Vincent Sixths)  
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)
Figures XIV-XV:

Prisoner's Dilemma
Percentage of (DD) Response State

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)

Chicken Game
Percentage (DD) Response State

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)
Analysis of Variance of the preasymptote cooperative (CC) data indicated a significant effect only for the outcome group ($F = 11.8; \text{df} = 3; p < .000$). The difference between the group of Hawks and all the others was large enough to be statistically significant ($p < .05$). The level of (CC) choices was higher for the Doves ($\text{mean} = 0.40; p < .05$) and lower for the Hawks ($\text{mean} = 0.17; p < .05$). The group of Sneakers made higher level of (CC) choices ($\text{mean} = 0.37; p < .05$) than the Dom-Subm ($\text{mean} = 0.27; p < .05$) and the Hawks, but lower than the Doves. Group differences were significant ($p < .05$) for all of them but the Sneakers and the Doves.

Table V: Percentage of Cooperative (CC) Choices by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vincent sixths</td>
<td>Criterion</td>
</tr>
<tr>
<td>Doves</td>
<td>.34</td>
<td>.55</td>
</tr>
<tr>
<td>Hawks</td>
<td>.18</td>
<td>.12</td>
</tr>
<tr>
<td>Dom-Subm</td>
<td>.21</td>
<td>.18</td>
</tr>
<tr>
<td>Sneakers</td>
<td>.37</td>
<td>.43</td>
</tr>
<tr>
<td>Mean</td>
<td>.24</td>
<td>.26</td>
</tr>
</tbody>
</table>
The analysis of (CC) choices by trials indicated no effect over preasymptote data. However, there was a significant effect for outcome group and type of game. The level of (CC) choices was greater in the Chicken than in the Prisoner's Dilemma (mean: PD = 0.27; p < .000; CK = 0.46; p < .000).

Analysis of Variance of the preasymptote competitive (DD) data indicated a significant effect for type of game (F = 21.6; df = 1; p < .000), and outcome group (F = 8.5; df = 3; p < .000).

Table VI: Percentage of Competitive (DD) Choices by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vincent sixths</td>
<td>Criterion</td>
</tr>
<tr>
<td>DOVES</td>
<td>.29</td>
<td>.20</td>
</tr>
<tr>
<td>HAWKS</td>
<td>.36</td>
<td>.46</td>
</tr>
<tr>
<td>DOM-SUBM</td>
<td>.32</td>
<td>.27</td>
</tr>
<tr>
<td>SNEAKERS</td>
<td>.27</td>
<td>.23</td>
</tr>
<tr>
<td>MEAN</td>
<td>.33</td>
<td>.34</td>
</tr>
</tbody>
</table>

As expected, the level of (DD) choices was higher for the Hawks (mean = 0.36; p < .05) and lower for the Doves (mean = 0.19; p < .05). The group of
Sneakers made lower level of (DD) choices (mean = 0.20; p < .05) than the Hawks. The Dom-Subm group indicated higher levels of (DD) choices (mean = 0.25; p < .05) than the Doves. The level of (DD) choices over preasymptote data was higher in the Prisoner's Dilemma (mean = 0.32; p < .05) than in the Chicken game (mean = 0.18; p < .05). Finally, no trials effects for the analysis of (DD) choices over preasymptote data (Vincent sixths) were detected.

3.3 Dominant-Submissive Outcomes:

Analysis of variance for the (DC) outcome over preasymptote data indicated no effects for the two factors (game and outcome group). However, analysis of covariates indicated that there was a significant effect for the family role factor (F = 3.7; df = 1; p < .07). In particular, elderly parents had a higher percentage of (DC) choices at the end of the game (mean = 0.21; p < .05), than their adult children (mean = 0.17; p < .05). This analysis was for the entire series of trials (300 trials), and with the data collapsed over the type of game. In addition, analysis of variance of the (DC) outcome with repeated measures on the trials factor, indicated no significant effect over the preasymptote data (Vincent sixths).
Table VII: Percentage of (DC) Choices by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vincent sixths</td>
<td>Criterion</td>
</tr>
<tr>
<td>DOVES</td>
<td>.19</td>
<td>.13</td>
</tr>
<tr>
<td>HAWKS</td>
<td>.22</td>
<td>.21</td>
</tr>
<tr>
<td>DOM-SUBM</td>
<td>.23</td>
<td>.28</td>
</tr>
<tr>
<td>SNEAKERS</td>
<td>.18</td>
<td>.17</td>
</tr>
<tr>
<td>MEAN</td>
<td>.21</td>
<td>.20</td>
</tr>
</tbody>
</table>

Analysis of variance of the (CD) outcome over preasymptote data for the response groups and game indicated no significant effects. Analysis of variance of the (CD) outcome with repeated measures on the trials factor, indicated no significant effect over the preasymptote data (Vincent sixths).

Table VIII: Percentage of (CD) Choices by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vincent sixths</td>
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<td>SNEAKERS</td>
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<td>.17</td>
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<tr>
<td>MEAN</td>
<td>.21</td>
<td>.20</td>
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</tbody>
</table>
3.4 First-Order Conditional Probabilities:

Reactive dispositions are more interesting measures of conflict resolution processes than individual (C) or (D) responses. Conditional probabilities are dyadic measures, and therefore, they convey information not only about individuals, but also about their relationships. Four reactive dispositions are analyzed in this section as dependent variables (Figures XVI-XXIII):

Trustworthiness (Cn+1/CCn): Analysis of variance of the trustworthiness preasymptote data indicated no significant effects for response outcome group and type of game (Figure XVII, pp. 67). However, the analysis of trustworthiness with repeated measures on the trial factor (Vincent sixths) indicated a significant effect over preasymptote data (F= 13; df = 5; p < .000).

Table IX: Percentage of Trustworthiness (Cn+1/CCn) by Game, Outcome Group, and Trials.

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<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
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<tr>
<td>MEAN</td>
<td>.67</td>
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</tbody>
</table>
Figures XVI-XVII:

Prisoner's Dilemma
Percentage of Trustworthiness (Cn+1/CCn)

5 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)

Chicken Game
Percentage of Trustworthiness (Cn+1/CCn)

5 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)
Trust (Cn + 1/DDn): Analysis of variance of the trust reactive disposition over preasymptote data indicated significant effects of outcome group (F = 3.0; df = 3; p < .032), and type of game (F = 7.2; df = 1; p < .008) (Figures XVIII-XIX, pp. 69). An examination of group means indicated that Hawks expressed the lowest level of trust (mean = 0.33; p < .05) as compared to the other groups. Sneakers (mean = 0.53; p < .05) presented a higher level of trust than the Doves (mean = 0.40; p < .05) or the Dom-subm (mean = 0.43; p < .05) group. Finally, analysis of variance indicated no significant effect of trust by trials (Vincent sixths).

Table X: Percentage of Trust (Cn + 1/DDn) by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
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<td>DOVES</td>
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<td>HAWKS</td>
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<td>DOM-SUBM</td>
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<td>.36</td>
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<td>SNEAKERS</td>
<td>.42</td>
<td>.39</td>
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<td>MEAN</td>
<td>.37</td>
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</table>
Figures XVIII-XIX:

**Prisoner's Dilemma**
Percentage of Trust (Cn+1/DDn)

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)

**Chicken Game**
Percentage of Trust (Cn+1/DDn)

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)
Repentance (Cn+1/DCn): Analysis of variance of the repentance
preasymptote data indicated a significant effect for outcome group (F = 4.8; df = 3; p < .09), and type of game (F = 4.1; df = 1; p < .04) (Figures XX-XXI, pp. 71). The difference between the group of Sneakers (who presented the highest level of repentance, mean = 0.45; p < .05), and the Hawks (with the lowest level, mean = 0.19; p < .05) was large enough to be significant at the p < .05 level of confidence. The post-hoc comparison Newman-Keuls test did not detect any other significant differences. Dyads participating in the game of Chicken expressed a higher level of repentance (mean = 0.40; p < .05) than dyads in the Prisoner's dilemma. Analysis of variance also indicated a significant effect of trials (Vincent sixths) over preasymptotic data (F = 2.7; df = 5; p < .02).

Table XI: Percentage of Repentance (Cn+1/DC) by Game, Outcome Group, and Trials.

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<td>MEAN</td>
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</table>
Figures XX-XXI:

Prisoner's Dilemma
Percentage of Repentance (Cn+1/DCn)

Chicken Game
Percentage of Repentance (Cn+1/DCn)
Forgiveness (Cn+1/CDn): Analysis of variance of the forgiveness conditional probability over preasymptote data indicated significant effect only for type of game (F = 9.9; df = 1; p < .002) (Figures XXII-XXIII, pp. 73). As noted by Rapoport and Chammah (1965) there are important differences in the interpretation of this reactive disposition for the Prisoner's dilemma and the Chicken game. In the Chicken game, forgiveness (Cn+1/CDn) is considered to be an "appeasing" response. The fear of a competitive outcome (DD) prevents the individual to play competitive (D) again, in other words, retaliation is not used so often in the Chicken game than in the Prisoner's dilemma. The level of forgiveness was much higher in the Chicken game (mean = 0.59; p < .05), than in the Prisoner's Dilemma (mean = 0.43; p < .05).

Table XII: Percentage of Forgiveness (Cn+1/CDn) by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
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<th>CHICKEN DILEMMA GAME</th>
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<td>Vincent</td>
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<td>.41</td>
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<td>DOM-SUBM</td>
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<td>SNEAKERS</td>
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<tr>
<td>MEAN</td>
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</tbody>
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Figure XXII-XXIII:

Prisoner’s Dilemma
Percentage of Forgiveness (Cn+1/CDn)

0 = Five First Trials
1-6 = Presymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)

Chicken Game
Percentage of Forgiveness (Cn+1/CDn)

0 = Five First Trials
1-6 = Presymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)
Analysis of the forgiveness probability by trials indicated a significant effect for trials \( (F = 8.8; \text{df} = 5; \ p < .000) \) over preasymptote data (Vincent sixths).

3.5 Cooperative and Competitive Reciprocity:

Analysis of variance for the cooperative reciprocity \( (C_n+1/C_n) \) dispositions prior to asymptote indicated significant effects only for outcome group state \( (F = 5.9; \text{df} = 3; \ p < .000) \) (See figures XXIV-XXV, pp. 77). The group of Doves and Sneakers made the highest level of cooperative reciprocity \( (\text{mean} = 0.63; \ p < .05) \).

The Newman-Keuls test indicated that the difference between these two groups and the group of Hawks (with the lowest level of cooperative reciprocity; \( \text{mean} = 0.44; \ p < .05 \)), was statistically significant. Analysis of competitive reciprocity over preasymptote data indicated no effect for trials (Vincent sixths).
Table XIII: Percentage of Cooperative Reciprocity (Cn+1/Cn) by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER’S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
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<td>HAWKS</td>
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<td>DOM-SUBM</td>
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<td>SNEAKERS</td>
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<td>.72</td>
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<td>MEAN</td>
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</table>

Analysis of variance for the competitive reciprocity (Dn+1/Dn) data prior to asymptote indicated significant effects for outcome group state ($F = 7.5; df = 3; p < .000$), and type of game ($F = 21.7; df = 1; p < .000$) (Figures XXVI-XXVII, pp. 78). The group of Doves made the lowest level of competitive reciprocity (mean = 0.38; $p < .05$). The Doves differ significantly from the Dom-Subm group (mean = 0.49; $p < .05$), and the Hawks. Hawks made the highest level of competitive reciprocity (mean = 0.64; $p < .05$). The Sneakers (mean = 0.46; $p < .05$) and the Dom-Subm groups also differ significantly from the Hawks.
The level of competitive reciprocity was much higher in the Prisoner's Dilemma (mean = 0.60; p < .05) than in the Chicken game (mean = 0.39; p < .05). Analysis of competitive reciprocity with repeated measures of trials evinced a significant effect of trials (F = 31; df = 5; p < .010) over preasymptote (Vincent sixths) data.

Table XIV: Percentage of Competitive Reciprocity (Dn+1/Dn) by Game, Outcome Group and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
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<tr>
<td>HAWKS</td>
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<td>DOM-SUBM</td>
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<td>SNEAKERS</td>
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<tr>
<td>MEAN</td>
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</tbody>
</table>
Figures XXIV-XXV:

**Prisoner's Dilemma**
Percentage of Cooperative Reciprocity (Cn+1/Cn)

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)

**Chicken Game**
Percentage of Cooperative Reciprocity (Cn+1/Cn)

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)
Figure XXVI-XXVII:

Prisoner’s Dilemma
Percentage of Competitive Reciprocity (Dn+1/Dn)

0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0 1 2 3 4 5 6 7 8

- Doves
- Hawks
- Dom-Subm
- Sneakers

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)

Chicken Game
Percentage of Competitive Reciprocity (Dn+1/Dn)

0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0 1 2 3 4 5 6 7 8

- Doves
- Hawks
- Dom-Subm
- Sneakers

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)
4. Attributional Data (Predict-Play Combinations):

4.1 Proportion of Cooperative Responses Predicted:

Analysis of variance of the predicted cooperative (C) choices over preasymtote data (Vincent sixths), indicated that response outcome state groups do not differ significantly regarding their level of predicted cooperation in either type of game.

Table XV: Proportion of Cooperative (C) Predictions by Game, Outcome Group, and Trials.

<table>
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<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
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<td>DOVES</td>
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<td>HAWKS</td>
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<tr>
<td>DOM-SUBM</td>
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<td>.70</td>
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<tr>
<td>MEAN</td>
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</tbody>
</table>
4.2 Accuracy of Predictions:

The analysis of interpersonal perception in a conflict situation is conducted by examining the relation between parents and adult children's perceptions of each other while in a gaming situation. The data in this section are based on individual perceptions. The accuracy of their prediction will be later used to analyze their actual interactive patterns. The analysis for the accuracy of correct prediction was conducted in three steps: the accurate prediction of (C) cooperative choices; the accurate prediction of (D) competitive choices; and finally the total level of accuracy (cooperative and competitive) over the post-criterion data collapsed by game and trials. The analysis of both cooperative and competitive predictions was decided since it was suspected that competitive choices would be more difficult to predict, in particular when playing the Chicken game.

4.3 Proportion of Accurate (C) Cooperative Predictions:

Analysis of variance of percentage of accurate cooperative (C) predictions over preasymptote data indicated that there was a significant effect for type of response state outcome group ($F = 31.5; \text{df} = 3; p < .000$), and type of game ($F = 3.8; \text{df} = 1; p < .03$). The mean difference between the group of Hawks (mean = 0.20; $p < .05$), and all others was significant. Doves made the highest
level of accurate prediction of cooperative (C) choices (mean = 0.63; p < .05).

The Sneakers group had a higher level of cooperative prediction (mean = 0.44; p < .05) than the Dom-Subm group (mean = 0.33; p < .05). Regarding the effect of the game structure, there was a higher level of accurate cooperative predictions for the game of Chicken (mean = 0.40; p < .05) than for the Prisoner's Dilemma game (mean = 0.29; p < .05) over preasymptote data (Vincent sixths). Finally, predictive cooperative (C) choices over preasymptote data (Vincent sixths) indicated a significant effect for the trials factor (F = 2.5; df = 5; p < .029).

Table XVI: Percentage of Accurate (C) Predictions by Game, Outcome Group, and Trials.

<table>
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<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
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<td>HAWKS</td>
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<td>.48</td>
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<td>MEAN</td>
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</table>
4.4 Proportion of Accurate (D) Competitive Predictions:

Analysis of variance indicated that there was a significant effect for outcome response state group \( (F = 17.6; \text{df} = 3; p < .000) \), and type of game \( (F = 4.4; \text{df} = 1; p < .05) \). The group of Doves made the lowest level of accurate prediction of competitive (D) choices \( (\text{mean} = 0.08; p < .05) \), and the Hawks made the highest accurate competitive (D) predictions \( (\text{mean} = 0.31; p < .05) \). The Sneakers group had a lower level of competitive (D) predictions \( (\text{mean} = 0.15; p < .05) \) than the Hawks. Finally, the Dom-Subm group \( (\text{mean} = 0.23; p < .05) \) also indicated a significant difference with the group of Hawks.

Table XVII: Percentage of Competitive (D) Predictions by Game, Outcome Group, and Trials.

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<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
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<td>DOM-SUBM</td>
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<td>MEAN</td>
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</table>
Regarding the effect of the game structure, there was a higher level of accurate competitive predictions over preasymptote data (Vincent sixths) for the Prisoner's Dilemma game (mean = 0.25; p < .05) than for the game of Chicken (mean = 0.15; p < .05). Finally, prediction of (D) choices by trials was not significant over preasymptote data (Vincent sixths).

4.5 Proportion of Total Accurate Predictions:

Analysis of variance of total accurate predictions over preasymptote data (Vincent sixths) indicated a significant effect for type of outcome state group (F = 12.6; df = 3; p < .000), and the family role factor (F = 9.9; df = 1; p < .002). The group of Doves made the highest level of accurate predictions (mean = 0.30; p < .05), and the Hawks made the lowest level of accurate predictions (mean = 0.25; p < .05). The Sneakers group had a higher level of accuracy (mean = 0.29; p < .05) than the Hawks. The group of aged parents made a lower level of accurate predictions (mean = 0.27; p < .05) than their counterparts adult children (mean = 0.28; p < .05). Finally, regarding the effect of the game structure, there was no significant effect for the total level of accurate predictions. Analysis of variance with repeated measures of trials (Vincent sixths) of total level of accuracy indicated a significant effect over preasymptote data (F = 3.7; df = 5; p < .003).
Table XVIII: Percentage of Total Accuracy by Game, Outcome Group, and Trials.

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<th>GROUP</th>
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<td>MEAN</td>
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5. Predict-Play Combinations: Intentions and Conflict Resolution.

These data analyze how parents and adult children’s perceptions relate to their actual interactive patterns. Interpersonal perceptions are measured by the subject’s prediction and actual response. These predict-play combinations are measures of the couples intentions and actual behavior in solving conflicts. The data is depicted in Figures XXVIII-XXXV).

Analysis of variance of the proportion of cooperative intentions (predict (C) and play (C)), with the preasymptote data collapsed over gender, and type of game, indicated that there was significant effects for the group response state group (F = 36; df = 3; p < .000), family role factor (F = 17.7; df = 1; p < .006), and type of game (F = 4.8; df = 1; p < .029). As predicted, the Doves made more
cooperative intentions (mean = 0.46; p < .05) than the Hawks (mean = 0.28; p < .05). Similarly, the Sneakers made a significant higher level of cooperative intentions (mean = 0.41; p < .05) than the Hawks. The Dom-Subm group (mean = 0.37; p < .05) made a significant lower level of cooperative intentions than the Doves.

Table XIX: Percentage of Cooperative intentions (P(C) P(C)) by Game, Outcome Group, and Trials.

<table>
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<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
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<tr>
<td>DOM-SUBM</td>
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<tr>
<td>SNEAKERS</td>
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<td>.52</td>
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<tr>
<td>MEAN</td>
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</tbody>
</table>

The group of aged parents made a lower level of cooperative intentions (mean = 0.15; p < .05) than their adult children (mean = 0.13; p < .05) (See Figures XXVIII-XXIX, pp. 86). There was a significantly higher level of cooperative intentions for the Chicken game (mean = 0.17; p < .05) than for the Prisoner's Dilemma game (mean = 0.11; p < .05). Finally, analysis of cooperative intentions by trials over preasymptote data (Vincent sixths) indicated a significant effect for trials (F = 3.1; df = 5; p < .010).
Figures XXVIII-XXIX:

**Prisoner's Dilemma**
Percentage of Cooperative Intentions $P(C) - P(C)$

- **Doves**
- **Hawks**
- **Dom-Subm**
- **Sneakers**

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)

**Chicken Game**
Percentage of Cooperative Intentions $P(C) - P(C)$

- **Doves**
- **Hawks**
- **Dom-Subm**
- **Sneakers**

0 = Five First Trials
1-6 = Preasymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)
Analysis of variance of the proportion of exploitative intentions (Predict (C) and Play (D)) with the preasymtote data collapsed over type of game, indicated no significant effects for the group response state factor, or the family role group. (See Figure XXX-XXXI, pp. 88).

Likewise, there was no effect for type of game or number of trials (Vincent sixths).

Table XX: Percentage of Exploitive Intentions (P(C) P(D)) by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER’S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vincent sixths</td>
<td>Criterion</td>
</tr>
<tr>
<td>DOVES</td>
<td>.12</td>
<td>.16</td>
</tr>
<tr>
<td>HAWKS</td>
<td>.12</td>
<td>.11</td>
</tr>
<tr>
<td>DOM-SUBM</td>
<td>.12</td>
<td>.17</td>
</tr>
<tr>
<td>SNEAKERS</td>
<td>.07</td>
<td>.08</td>
</tr>
<tr>
<td>MEAN</td>
<td>.11</td>
<td>.13</td>
</tr>
</tbody>
</table>
Figure XXX-XXXI:

Prisoner's Dilemma
Percentage of Exploitive Intentions $P(C) - P(D)$

0 - Five First Trials
1-6 = Presymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)

Chicken Game
Percentage of Exploitive Intentions $P(C) - P(D)$

0 - Five First Trials
1-6 = Presymptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (300 Trials)
Analysis of variance of the proportion of apprehensive intentions or appeasement in Chicken game, (that is predict (D) and play (C)) over preasymtote data (Vincent sixths), and collapsed over type of game, indicated no significant differences for the outcome response state group. Dyads expressed similar levels of forgivenes (apprehensive) intentions. (See Figures XXXII-XXXIII, pp. 90).

Table XXI: Percentage of Apprehensive Intentions (P(D) P(C)) by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vincent sixths</td>
<td>Criterion</td>
</tr>
<tr>
<td>HAWKS</td>
<td>.28</td>
<td>.33</td>
</tr>
<tr>
<td>DOM-SUBM</td>
<td>.21</td>
<td>.27</td>
</tr>
<tr>
<td>SNEAKERS</td>
<td>.21</td>
<td>.19</td>
</tr>
<tr>
<td>MEAN</td>
<td>.23</td>
<td>.23</td>
</tr>
</tbody>
</table>
Figure XXXII-XXXIII:

**Prisoner's Dilemma**
Percentage of Apprehensive Intentions $P(D) - P(C)$

0.5
0.4
0.3
0.2
0.1
0
0 1 2 3 4 5 6 7 8

- Doves
- Hawks
- Dom-Subm
- Sneakers

0 = Five First Trials
1-6 = Premptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (500 Trials)

**Chicken Game**
Percentage of Apprehensive Intentions $P(D) - P(C)$

0.5
0.4
0.3
0.2
0.1
0
0 1 2 3 4 5 6 7 8

- Doves
- Hawks
- Dom-Subm
- Sneakers

0 = Five First Trials
1-6 = Premptote Data (Vincent Sixths)
6-7 = Criterion; 7-8 = Post-Criterion (500 Trials)
Analysis of variance of the proportion of defensive intentions (Predict (D) and Play (D)) over presymptote data and collapsed over game, indicated that there was a significant effect for the group response state factor (F = 3.6; df = 3; p < .014), and type of game (F = 12; df = 1; p < .001). The Hawks made more defensive responses (mean = 0.31; p < .05) than the Doves (mean = 0.18; p < .05), the Dom-Subm group (mean = 0.23; p < .05), and the Sneakers group (mean = 0.18; p < .05). Regarding the type of game, defensive intention were higher in the Prisoner's dilemma game (mean = 0.29; p < .05), than in the Chicken (mean = 0.15; p < .05). Finally, the analysis of repeated measures for trials over presymptote data did not indicated any significant effect on defensive intentions. (Figures XXXIV-XXXV, pp. 92).

Table XXII: Percentage of Defensive Intentions (P(D) P(D)) by Game, Outcome Group, and Trials.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRISONER'S DILEMMA GAME</th>
<th>CHICKEN DILEMMA GAME</th>
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<td>Vincent sixths</td>
<td>Criterion</td>
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<tr>
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<td>.27</td>
<td>.18</td>
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<tr>
<td>HAWKS</td>
<td>.31</td>
<td>.34</td>
</tr>
<tr>
<td>DOM-SUBM</td>
<td>.31</td>
<td>.27</td>
</tr>
<tr>
<td>SNEAKERS</td>
<td>.24</td>
<td>.22</td>
</tr>
<tr>
<td>MEAN</td>
<td>.28</td>
<td>.25</td>
</tr>
</tbody>
</table>
Figures XXXIV-XXXV:

**Prisoner's Dilemma**
Percentage of Defensive Intentions $P(D) - P(D)$

- Doves
- Hawks
- Dom-Subm
- Sneakers

0  = Five First Trials  
1-6  = Preasymptote Data (Vincent Sixths)  
6-7  = Criterion; 7-8 Post-Criterion (300 Trials)

**Chicken Game**
Percentage of Defensive Intentions $P(D) - P(D)$

- Doves
- Hawks
- Dom-Subm
- Sneakers

0  = Five First Trials  
1-6  = Preasymptote Data (Vincent Sixths)  
6-7  = Criterion; 7-8 Post-Criterion (300 Trials)
6. Social and Personal Characteristics of Outcome Response Groups:

Dyads in each group were examined in term of the following social and personal characteristics: a) intergenerational relations including the dimensions of affectual solidarity, generational interaction, intergenerational communication, and intergenerational exchange or functional solidarity (V.L. Bengtson, 188); b) intergenerational norms (Heller, 1970); c) authoritarian personality (The California F-Scale, T. Adorno, 1950); and d) Self-concept (Rosenberg, 1965).

Results indicated no significant difference between the group of Doves, Hawks, Dom-Subm, and Sneakers regarding these dimensions. Furthermore, they presented no significant differences with respect to gender, education, or social class. Results indicated that the four groups are very similar in term of these social and personal dimensions.

On the other hand, dyads showed some differences when examining the family role factor. (i.e., when looking at differences between the group of parents and children). Aged parents and their adult children differed in their level of education and in their level of authoritarian personality. Analysis of variance indicated a significant effect for this personality dimension (F = 8.2; df = 1; p < .005). Aged parents had a higher score in the F-California scale (mean = 93.8) than adult children (mean = 83.6).
Family role was particularly relevant for the Dom-Subm dyads, since more than two thirds of the "dominant" role were taken by the parents. The score at the end of the game was also indicative of the family role difference, since aged parents scored more points than their adult children (p < .09).

Individual scores at the end of the game also indicated a difference between parents and children. Analysis of variance found a significant effect of number of points for the type of game (F = 39; df = 1; p < .000), and the outcome state groups (F = 20; df = 3; p < .000). For each game Doves were the group that presented higher scores, followed by the group of Sneakers, the Dom-Subm, and then the Hawks.

Finally, there were no significant effects regarding factors such as age or the type of dyad. In spite of the sample limitations, mother-daughter dyads indicated the same level of cooperation and competition as compared to father-son, mother-son, or father-daughter dyads.
VI. SUMMARY AND DISCUSSION:

1. Findings (summary):

   **Hypothesis 1:** "Aged parents and adult children dyads who attain a stable cooperative state will be characterized by a higher level of competitive reciprocity in a Prisoner's Dilemma game than in the Chicken game."

   Analysis of variance of competitive reciprocity over preasymptote data indicated that competitive reciprocity was much higher in the Prisoner's dilemma than in the Chicken game. In particular, the percentage of competitive reciprocity for Doves was higher in the prisoner's Dilemma game (mean = 0.51; p < .05) than in the Chicken game (mean = 0.29; p < .05) over preasymptote data (Vincent sixths). The type of game was also significant regarding the level of defensive (predict (D) - play (D)) intentions. In particular, dyads expressed a higher level of defensive intentions in the Prisoner's dilemma game (mean = 0.29; p < .05), than in the game of Chicken (mean = 0.15; p < .05). Thus, these findings support hypothesis number one.

   **Hypothesis 2:** "Aged parents and adult children dyads will attain states of stable cooperation and competition in an experimental game situation."
Stables response outcomes were obtained in a game situation. In particular, the percentage of dyads who reached the established criteria to be classified as Doves, Hawks and Dom-Subm, was higher in this sample of aged parents and adult children (fifty six percent, N=113) than in other sample populations (i.e., married couples (fourty seven percent, N=180; Epstein and Santa Barbara, 1974). In addition, dyads who did not reach the criteria (Mug-Wump) were identified as Sneakers, and a particular interactive pattern was identified for them. Therefore, hypothesis 2 was also supported by these findings.

**Hypothesis 3:** "Cooperative aged parents and adult children dyads will be characterized by a cautious trust strategy."

Analysis of variance of percentage of cooperation (C) indicated that Doves indicated more cooperative (C) choices than the other groups, and more cooperative joint (CC) responses. Doves also had, along with the Sneakers, the highest levels of trustworthines and trust. Doves also expressed the highest level of cooperative intentions, that is, they play cooperatively (C) when they expected a cooperative choice (C) from their partners. These results indicate that the level of actual cooperation and intentions to cooperate were distinctive of the group of Doves.

On the other hand, Doves also display a moderate level of competitive (D) choices as a response to their partners defective (D) behavior. Therefore, Doves
may be characterized with the two basic components of "the cautious trust strategy." The later requires two elements: the cooperative signaling and the competitive reciprocity. Hypothesis number two is supported by these findings.

**Hypothesis 4:** "Aged parents and adult children dyads who attain a stable outcome of cooperation will perceive each other as being more cooperative and express more cooperative intentions than non-cooperative dyads."

Analysis of variance of cooperative intentions over preasymptote data indicated that Doves made more cooperative intentions than the other dyads. In addition, they also expressed the lowest level of defensive intentions (predict (D) - play (D)). Therefore, hypothesis four is also confirmed.

**Hypothesis 5:** "Aged parents and adult children dyads whose members are females will be more cooperative than those dyads whose members are males."

Analysis of covariates of percentage of cooperative (C) choices over preasymptote data indicated that being male or female is not statistically significant. In addition, gender did not have any effect for the other strategic variables. Therefore, hypothesis five is not supported.
Hypothesis 6: "Aged parents and adult children dyads who attain a stable cooperative state will tend to be less authoritarian than aged parents and adult children dyads who attain a stable competitive state--higher score in the California F-scale."

Analysis of variance of the authoritarian dimension of personality by type of response outcome group indicated that Doves did not differ from any other group regarding their score in the California F-scale. Therefore, this finding does not provide support for hypothesis six.

Hypothesis 7: "Aged parents and adult children dyads who indicate a high level of self-esteem will tend to be more cooperative in a gaming situation."

Analysis of variance of self-concept by outcome response group did not indicate any significant difference among groups. Doves, Hawks, Dom-Subm, and Sneakers seem to have similar scores in the self-esteem scale. Therefore, these findings do not support hypothesis seven.

Hypothesis 8: "Aged parents and adult children dyads who indicate a high level of solidarity will tend to be more cooperative in a gaming situation."
Analysis of variance of intergenerational solidarity dimensions by response state outcome groups did not indicate any significant difference. Doves reported similar levels of intergenerational solidarity than the other groups. Therefore, hypothesis eight is not supported.

2. Intergenerational Cooperation and Stable Outcomes:

The percentage of cooperative (C) choices for the sample of aged parents and adult children was moderate for the presymptote data and the criterion block of trials, but rather high at the end of the game. High levels of cooperative choices (such as 0.50) are not frequent in game literature. The proportion of cooperative (C) responses over presymptote data (Vincent sixths) was similar to that of cooperative married couples for the same games and matrixes (Epstein and Santa Barbara, 1974). In addition, in this study, in particular the Doves made a rather impressive high percentage of (C) choices at the end of both games (PD = 0.70; CK = 0.86). Nevertheless, when examining the process of individual cooperation, it appears that the difference between the Doves and the other groups regarding their level of cooperative (C) choices occurred at the time of asymptote, or after
their stabilization as a cooperative dyad. Dyads did not differ in their proportion of cooperative (C) choices at the beginning of their interaction. Likewise, they did not increase their cooperative (C) choices until after they agreed upon a response state outcome, that is, after the criterion trials.

The level of cooperative (C) choices did not increase gradually, but it jumped at the time of the asymptote state. This description of the process of managing conflict of interests may suggests that in the emergence of cooperative strategies or response states, other emotional, nonrational motivations may be present. Human relations, and in particular generational relations, are evolving systems interacting within the given society. Aged parents and adult children's strategic interaction operates within the boundary of the family, and also within the boundaries of the larger social system. Social norms and personal communication patterns may influence the way individuals and families make transitions to new stages, or fail to do so. Thus, it is my contention that individuals resume new forms of interaction whenever they realize that their interactive process is also a matter of the group and situation. Individuals are parts, but interactions are wholes. As Kurt Lewin (1951) phrased it, "the whole is different from the sum of its parts; it has definite properties of its own."

In summary, this particular index of cooperative (C) choices does not provide much information about the process of getting or learning to cooperate. It
suggests that cooperation may not happen as a gradual learning process, at least for this sample, but as a consequence of other concurrent factors that may influence the cooperative resolution of conflict of interests.

Results from the sample of aged parents and their adult children indicated that different dyads solved conflict situations in a very different way. However, based on the dyads' initial interactions, and in their naturally occurring response state outcomes, it appears that the pattern of intergenerational cooperation proved to be rather complex and diverse. In addition to dyads who became mutually reciprocal right at the beginning of their interaction, at least four different response states to a conflict situation were recognized. First, the group of cooperators or Doves who, ended up with the highest scores (final number of points) in both structural conflict situations. Second, the group of competitors or Hawks who voluntarily locked themselves in negative outcomes. Third, the group of cooperative subordination and competitive domination or Dom-Subm who were unable to solve their conflict situation in a fair way. And fourth, the group of "humbug" cooperation or Sneakers, who aborted their cooperative responses with their constant attempt of getting "the lion's share."

The percentage of mutually cooperative (CC) choices, seems to be more interesting as an index of cooperation. Cooperation, as a response to manage conflict of interests, is a dyadic phenomenon that requires more than the individual
intention to cooperate. It demands the other's response in such a way that mutual benefits be the outcome. Some of the aged parents and their adult children dyads were able to solve the experimental conflict situation in a cooperative (CC) response after an iterative interactive process. This was an expected finding since intergenerational relations and family relations in general are portraited as very cooperative and sometimes altruistic relations. However, when examining the cooperative outcome state (CC) in this study some caveats may be in order: first, only twenty one out of eighty two aged parents and adult children reached the cooperative response state (Doves); second, the Doves, even though they stabilized at similar number of trials than other previous studies and populations (Epstein and Sanata Barabara, 1972), they needed a rather large number of iterations to solve the conflict situation in a joint cooperative outcome (N = 109 trials). These two observations are important because the family, and thus intergenerational bonds, are assumed to be the sacred place for cooperation and solidarity.

Furthermore, it is also interesting to note that more dyads should have been classified as Doves, since they responded voluntarily to participate in this study. Therefore, it could be expected that they would have represented dyads who usually manage their conflict in a positive way or at least tend to cooperate in many other areas in their everyday interactions. In addition to the number of interaction needed to cooperate, and the number of total cooperative dyads, the Doves, as well
as the other groups, reported that they would have played the game in a similar fashion had they had to play it with a friend, a neighbor, a relative, or even a stranger.

These findings suggest that intergenerational relations, and in particular aged parents and adult children interactions, are no exception to any other type of human interaction where competition and conflict of interests are relevant factors. There should be no surprise if conflict arises even in situations were solidarity and mutual interest is present and expected, or even when biological ties play a central role in individual relations. Indeed, conflict seems to be an inevitable occurrence of all social interactions. As Simmel (1971) indicated, "a certain amount of discord, inner divergence and outer controversy, is organically tied up with the very elements that ultimately hold the group together..."
3. Stable Outcome and Preasymptote Interactions:

It is one of the aims of this study to examine the pattern of conflict managing among aged parents and their adult children so that norms could be established and used to overcome interpersonal conflicts. The goal is to recognize normative patterns that might lead to reconcile incompatible interests.

Dyads were classified regarding their cooperative or competitive interactive patterns, and then, each group was examined regarding its interactive patterns prior to their conflict resolution. The purpose was to isolate what kind of particular interactive patterns would lead to high levels of cooperation or competition.

The group of Doves made the highest level of cooperative (CC) choices in both games. Doves were more trustworthy than any of the other groups. Cooperative aged parents and adult children almost always responded cooperatively to their partners' cooperative moves in both games. Therefore, as predicted the behavior of the Doves prior to asymptote could be characterized by a high degree of trusting (percentage of cooperative (C) choices), and trustworthiness (the percentage of (C) responses after a joint cooperative (CC) outcome).

On the other hand, it is important to notice that the conditional probability of trustworthiness which, in previous research (see Santa Barbara and Eptsein, 1974) has been recognized as a distinctive reactive disposition for the group of
Doves, did not make a significant difference among the response outcome group. In other words, cooperative or competitive aged parents and adult children dyads made similar levels of trustworthiness behavior. Aged parents and adult children, regardless of their long run intentions and defecting behavior, responded cooperatively to their partners' cooperative moves.

Doves also displayed a moderate level of competitive reciprocity, i.e., they made a competitive (D) choice after a competitive (D) choice on the other player (figures XXVI-XXVII, pp. 78).

The Doves displayed a higher level of competitive reciprocity in the Prisoner's dilemma than in the game of Chicken. In confirmation of hypothesis three, this is part of what previous research has characterized as a "cautious trust strategy." Two elements are the basic components of this strategy, a "cooperative signaling and firmness component" (Santa Barbara, 1972).

Competitive reciprocity is interpreted as an attempt to prevent partners from exploiting your cooperativeness. However, competitive reciprocity when used at high levels may certainly produce an escalation of competition and conflict.

It is probably certain that Doves succeeded in avoiding a conflict spiral indicating their potential to cooperate. Doves made high percentage levels of trust (cooperative (C) choice after a competitive (DD) outcome), and repentance (cooperative (C) choice after a competitive (DC) outcome) behavior.
Doves were very sensitive to the type of conflict situation: their level of trust, and repentance was higher for the game of Chicken than in the Prisoner's dilemma. In addition, Doves made the highest level of forgiveness (cooperative (C) choice after a (CD) outcome) in the Prisoner Dilemma, and the highest level of appeasement in the Chicken game, respectively. Parents and adult children may engage in more competitive interactions whenever the destructive potential of the conflict of interests is viewed as less threatening. As Coser (1956) noted, a distinction should be made between conflicts that concern the basis of human relations, and those that concern less important issues. The former type is expected to have a different impact upon the relationship that the later.

Furthermore, this distinction between conflicts can be made over the basis of consensus. As Ortega y Gasset (1946), the Spanish philosopher indicated, “divergences in surface layers produce beneficial conflict because the ensuing struggles move upon the firm ground of deeper concord. Questioning certain things, but not questioning all, minor divergences serve but to confirm and consolidate the underlying unanimity of the collective existence.”

On the other hand, the group of Hawks displayed a different pattern of interaction. The total number of dyads who were classified as Hawks was twenty-three (two more than Doves). However the majority of them (nineteen dyads)
played the Prisoner's dilemma. Only four dyads playing the Chicken game became Hawks.

Hawks displayed the lowest level of trusting (cooperative (C) choices), and trustworthiness (cooperative (C) after a (CC) outcome) behavior for both games. Similar to the group of Doves, the level of competitive reciprocity for the Hawks was higher in the Prisoner's dilemma than in the Chicken game. However, the Hawks willingness to cooperate was clearly insufficient to prevent the conflict spiral. Regarding the structure of the game, there seemed to be a clear game factor since only four dyads became Hawks in the high conflict situation or Chicken game. However, Hawks did present similar levels of competitive reciprocity and mutual defection than those in the low conflict situation or Prisoner's dilemma game. This group also made the lowest level of repentance (cooperative (C) choice after a competitive (DC) outcome), and forgiveness (cooperative (C) choice after a (CD) outcome) behavior in the Prisoner Dilemma. Certainly, they also made the lowest level of appeasement (forgiveness) behavior in the Chicken game.

The two basic response outcome groups central to this study were cooperators (Doves) and competitors (Hawks). However, from the beginning of the experiments, other interesting response state outcomes were present. In particular the group of dominant-submissiveness became very prominent. The total number of dyads classified into this category were twenty one, but there were
eleven additional dyads who stabilized in a dominant-submissive response after the very first trials. These highly Dom-Subm dyads were left out of the analysis. Altogether the Dom-Subm group was the most frequent response state outcome from the series of experiments for both games (almost thirty percent). In previous research using the same experimental structures, and based on other populations Dom-Subm dyads were much less frequent. For example, less than one percent among college students (Santa Barbara, 1972), and twenty one percent among married couples (Santa Barbara and Epstein, 1974).

The dominant-submissive group (Dom-Subm) displayed more trusting (cooperative (C) choices), trustworthy (cooperative (C) choices after a (CC) cooperative outcome), and cooperative reciprocal behavior than the Hawks. The Dom-Subm group solved the escalation to a conflict spiral by designating who would play the role of the dominant or submissive partner. The interactive pattern found between aged parents and adult children who became dominant-submissive indicated that the generational family role (i.e., being parent or children) was an influential factor. A closer examination of the Dom-Subm group, indicated that fourteen adult children were the submissive members of the dyad. This represents more than two thirds (63.4%) of the twenty two total submissive members. This is a dramatic influence of parents over their children.
One factor which may had had an effect on the frequency of this outcome group is the reward effect (money in the form of awards for the ten individual highest scores). Some participants, mostly the children, expressed at the end of the experiments that they decided to give up all the points to the other player, so that, by the end of the game, they would have a good chance of getting the money. Needless to say, that the submissive partner had the expectation of getting his share from that money, since as one of them put it "after all we are "family."

Among the group of moderate cooperation or Sneakers, dyads were characterized for their ability to trust (cooperative (C) choices), and exhibit trustworthiness (cooperative (C) choice after a (CC) cooperative outcome) behavior at higher levels than the Hawks and the Dom-Subm dyads, but at lower level than the Doves. Sneakers also had a higher level of repentance and forgiveness behavior than the Hawks and the Dom-Subm dyads. The type of game was also a significant factor, since the level of cooperation for the Sneakers was higher in the game of Chicken than in the Prisoner's dilemma. This pattern was the same for the Doves, though, the latter evinced higher levels of trust and cooperation.

On the other hand, the level of competitive reciprocity was higher for the Sneakers than for the Doves in both games. It was clearly this "firmness" defensive component in their response that prevented them from mutual cooperation at the level of the Doves. Finally, there was also a sharing characteristic for both
groups concerning the level of appeasement behavior when playing the game of Chicken. Sneakers and Doves, not surprisingly, might have felt similar fear of a competitive (DD) outcome in the game of Chicken, and thus their appeasement levels were quite similar.

4. Stable Outcomes and Interpersonal Perceptions:

In this study, in addition to making a cooperative or competitive choice, subjects were asked to predict their partners' choice. By requiring aged parents to predict their adult children's behavior in each trial, information on how cooperative they perceived each other to be, on how accurate they were in their predictions, and on their real intentions to play was obtained.

Results from this study confirmed predictions regarding the association between cooperative intentions and stable outcome groups. Cooperative aged parents and adult children dyads indicated the higher level of cooperative intentions than the other groups, and competitive dyads expressed more defensive intentions. This is similar to previous research on cooperative intentions (Epstein and Santa Barbara, 1975).
Aged parents and adult children dyads indicated differential perceptual and intentional processes. All response state groups predicted more cooperation than competition (in particular the group of Doves and Sneakers). However, the relationship between cooperative intentions and expected cooperation was positive only for aged parents and adult children, who made high (Doves) or moderate (Sneakers) levels of cooperative behavior. In other words, they not only perceived one another as cooperative but also exhibit a high level of cooperative behavior. (Percentage of Cooperative and Defensive Intentions, figures XXVIII-XXIX, pp. 86; and XXXIV-XXXV, pp. 92, respectively)

Contrary to expectations aged parents and adult children presented similar levels of exploitative and appeasement intentions.

Hawks and Dom-Subm dyads expected more cooperative choices from the other, than the actual cooperative moves the dyads made. It is also of interest to note that this situation continued even after these dyads stabilized in one of the competitive response state. Contrary to the expectations, the level of accuracy of cooperative (C) and competitive (D) choices was very similar for all groups in both games. Furthermore, dyads in all groups did not change significantly their predictions during the game. The Doves were the group who made the most accurate predictions. They were much better in predicting cooperative (C) choices than competitive (D) choices. The opposite was also true for the group of Hawks.
5. Stable Outcomes, Social and Personal Characteristics:

Aged parents and adult children response state groups differ in their strategic interactions in the process of solving conflict situations. Some strategies were recognized for each type of group. However, an additional interesting question has been raised regarding the relationship between these groups and their member's social and personal dispositions. Previous research has studied this relationship and results have been mixed (Terhune, 1970; Santa Barbara, 1972; Epstein and Santa Barbara, 1974).

Results from demographic, social and psychological data collected from aged parents and adult children in this study indicated that Doves, Hawks, Dom-Subm, and Sneakers do not differ regarding their personal and social predispositions.

This study found no significant gender differences between outcome response groups and their pattern of interactions. Contrary to prediction, results indicated that being male or female does not preclude aged parents and adult children response state to solve conflicts. This finding is consistent with previous studies of married couples (Raush, et al., 1974; Santa Barbara and Epstein, 1974). Nevertheless, the small number of males in the sample may have covered any real gender effects. This is also true for the analysis of type of dyad, that is, the
sample of aged parents and adult children did not include enough dyads for each type of family role, in order to further examine cross-gender and cross-generational interactive patterns.

This study also studied the influence of personality traits upon individuals style of conflict situations. The prediction that relates individual authoritarian attitudes with the group of competitor or Hawks could not be proven. However, this finding may also be affected by the type of sample, since extreme authoritarian personality may not have a high degree of occurrence in this non-random sample of aged parents and adult children.

Similar results were obtained regarding the relationship between the individual's self-esteem and outcome groups. Contrary to prediction, no difference among groups and the level of their member's self-esteem was detected. The argument made by Kohn (1986) in the case against competition "competitiveness eventually comes down to self-esteem," could not be supported.

Contrary to prediction, there was no relationship between the measures of generational solidarity and the outcome groups. Aged parents and their adult children' self-reported solidarity did not seem to discriminate over the process of cooperation and stable outcome groups. These findings are surprising, since studies on family violence and conflict (Gelles and Cornell, 1990) have indicated the common place of the family for violence and conflict behavior. Therefore, it was
anticipated that dyads who reached different cooperative or competitive response
state would also differ in their level of generational conflict and solidarity.

It is true that the sample of aged parents and adult children who participated
in the experiments was a non-representative sample, however other factors may
also be considered. The first one is the question of bias on the part of individuals’
self-report on their personal and familial relations. In particular since the
normative idea of keeping family affairs a private matter, it is conceivable that
family members do not report their actual level of conflict and competing attitudes
to outsiders. This would be a parallel effect similar to those dyads in the game
situation that underestimated their actual competitive reciprocity.

Contradictions were detected at the end of the experiments when dyads were
asked about their cooperative intention during the game. More than two-thirds of
the Dove dyads felt that they were cooperating during the game, however, almost
fifty per cent of the Hawk dyads declared that they were cooperating with their
partners during the game. This answer was even more surprising since each
participants was aware of his own score at each trial during the game.

Another factor to consider concerns several methodological and theoretical
differences within research in family relations. The study and understanding of
generational relations from a functional-positivistic approach focuses on the
individual as unit of analysis (Atkinson, Kivett and Campbell, 1986; Mangen,
Generational relations and in particular family solidarity, is explained by individual attributes such as affection or attachment. This research considers family solidarity or intergenerational cooperation as the outcome variable. However, systemic and structural approaches to the study of family and intergenerational relations focuses on the study of cooperation as an interactive process rather than an outcome. The focus is on how family members negotiate and solve their conflicting interests (Broderick, 1993). Family solidarity or intergenerational relation examine "how their members develop attitudes and skills in their attempt to survive as interactive dyadic systems" (Sprey, 1979).

6. Concluding Observations:

In this study, the use of Game theory was used to examine the process or interaction among family members. Game theory provides "relational" information and it examines dyads regarding their reactions and conditional responses. Therefore, the aim of this study was to show the kinds of learning processes of cooperation and conflict that are present in inter-generational relations. The
individual self-reported emotional and instrumental dimensions of their family relations are not considered from this point of view. This is not to say that aged parents and adult children do not have significant differences regarding their self-reported level of effectual and instrumental solidarity. Aged parents and adult children, though, still may have to learn to manage their incompatible interests and conflicts.

The present research has focused on the description of interactive patterns between elderly parents and their adult children. Parents and adult children indicated different amounts of flexibility on both the behavioral and intentional responses when managing conflicts situations. Findings have suggested that conflict or competitive attitudes are relevant factors in generational relations. Aged parents and adult children indicated that even if they displayed stable and intense relationships, there exists an ongoing process of managing incompatible interests in their interactions. Dyads expressed different patterns of reciprocal interactions which may lead to different response state outcomes. The fact of family harmony or continuity is not challenged, but it is taken as the "natural" environment or systemic framework.

Intergenerational relations between elderly parents and adult children are part of this family system whereas "roles" appears to be relevant mediators in
personal relations. In terms of this research, intergenerational relations seem to be mediated by individuals' perceptions of and expectations from each other.

Finally, several implications for public policy and family research can be suggested:

The first is that family harmony, and in particular, intergenerational solidarity must be considered a problematic rather than a normal state of affairs. Cooperation is seen as the interpersonal capability to solve conflictive interests for a mutually rewarding outcome. As this study shows the content and intensity of solidarity should not be the exclusive focus when examining family relations. A distinction has to be made between the management and the outcome of conflict resolution.

The second implication is in relation to family caregiving. The caregiving literature has indicated the importance of managing caregiving stress (Matthews, 1987; Matthews and Rosner, 1988; Brody, 1990). Providing help and care for family member has become one of the most relevant tasks for adult children today. The finding in this study may suggest that much more attention should be paid to the negotiating process between parents and their adult children. The question is not if adult children would take care of their dependent parents, but if they would develop cooperative strategies in order to solve their conflictive interests in a mutually positive way.
Furthermore, policymakers need to design policies aimed to encourage formal and informal family caregivers to develop and strengthen cooperative strategies in their relations with recipients of care-receivers. As this and previous research has found, cooperative dyads are mainly characterized by a "cautious trust strategy." Policies must be developed to address the basic elements of this strategy: the cooperative signaling and the firmness or competitive intentions. Experimental social policymakers need to translate into real life situations the necessary strategic orientations for family members to avoid not only an escalation of spiral conflict, but also to overcome the seduction of moderate cooperation. A selection of behavioral strategies that would include concepts such as threats, trust, negotiation, compromise, may serve as useful conflict regulatory mechanisms. The purpose in developing these strategies would be to empower individuals and families to overcome intra-and-interpersonal vulnerability to unresolved conflicts.
APPENDIX A

CASE WESTERN RESERVE UNIVERSITY  DEPARTMENT OF SOCIOLOGY
NEEDS PARTICIPANTS
FOR AN EXPERIMENTAL RESEARCH STUDY

1 PARENT (FATHER or MOTHER) 50
or more years

AND

1 CHILD (SON or DAUGHTER) 25
or more years

EXPLANATION:
THE PURPOSE OF THIS STUDY IS TO LEARN ABOUT INTERPERSONAL
COOPERATION. YOU WILL BE ASK SOME QUESTIONS ABOUT YOUR
FAMILY RELATIONS. IN ADDITION YOU WILL BE ASKED TO PLAY A
GAME, IN WHICH THE POTENTIAL EXISTS TO EARN MONEY (UP TO
$100) DEPENDING UPON HOW WELL YOU DO IN THE GAME. IT WILL
LAST ABOUT ONE HOUR. INFORMATION WILL BE CONFIDENTIAL.
THE INTERVIEWS WILL BE CONDUCTED IN THE DEPARTMENT OF
SOCIOLOGY AT C.W.R.U. (MATHER MEMORIAL BUILDING, 223C).

ARE YOU INTERESTED? IF SO, PLEASE,
CONTACT:
Julian Montoro, M.A.
(C.W.R.U., Department of Sociology)
Ph. (216) 368-5173

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APPENDIX B

PARENT-CHILD RELATIONSHIP STUDY: CONSENT FORM

ID ___

EXPLANATION:
The purpose of this experiment is to learn about interpersonal cooperation. You will be asked some questions about your family relations. In addition, you will be asked to play a game with one of your relatives in which the potential exists to earn money. The amount of money that you win will depend upon how well you do in the game. The game last about one hour.

RISKS:
There are no physical or psychological risks involved in this experiment. All procedures are harmless.

CONFIDENTIALITY:
To protect the safety of the information you provide, we are assigning numbers to the game responses of every player. These numbers will be used in place of names on all experimental materials. No information related to your performance will be communicated to anyone else.

BENEFITS:
The results of this study will contribute to scientific knowledge and to our understanding of human behavior, in particular, intergenerational relations. You are free to withdraw your consent and discontinue participation at any time during this game. Any comments or criticism about this research may be directed to the experimenter.

I have read the above and give my consent to participate in the study.
I understand that all information about performance will remain confidential.

--------------------------- ---------------------------
Name                      Date

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APPENDIX C

INSTRUCTIONS

You can see that the panel in front of you is divided into four squares. Each square has two numbers on it. Below the panel there are two set of buttons. Later, you can push one or the other of these buttons. The numbers in the squares indicates the number of points each of you can win or lose on a particular trial, depending on which buttons are pushed. The number of points you win or lose is printed in large type, and the number of points the other player wins or loses is printed in smaller type. Your objective in this situation is to win as many points as possible. Each of you will receive a minimum of $10.00 for participating. In addition, ten awards (1 of $100.00; 1 of $50.00; and 3 of $25.00 for each type of game) will be given to the ten subjects who will present the highest scores.

HOW TO PLAY: PLAYER 1

Player 1 is the "row player" or "green player." You will receive the points that are displayed in large type on the light panel. You are in control of which row will score points (player 2 or the red player is in control of which column will score points.) As you play you will need to hit two buttons for each trial. Your buttons are laid out:

<table>
<thead>
<tr>
<th>Green # A</th>
<th>Green # B</th>
<th>Red # A</th>
<th>Red # B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Row # A)</td>
<td>(Row # B)</td>
<td>(Column # A)</td>
<td>(Column # B)</td>
</tr>
</tbody>
</table>
First, you should make a guess as to what player 2 will be doing. That is, hit Red # A if you think he/she will be choosing the first column or hit Red # B if you think he/she will be choosing the second column. Guess what move you think the other player will actually make; do not use your red buttons to indicate what you would like the other player to do.

Second, you need to make your own choices. If you want to choose row # A, push Green # A or if you want to choose row # B, push Green # B. As you push each of these buttons, you should see the corresponding green or red light turn on to indicate your guess and actual choice.

II. HOW TO PLAY: PLAYER 2

Player 2 is the "column player" or "red player." You will receive the points that are displayed in large type on the light panel. You are in control of which column will score points (player 1 or the green player is in control of which row will score points). As you play you will need to hit two buttons for each trial. Your buttons are laid out:

Green # A    Green # B    Red # A    Red # B
(Row # A)    (Row # B)    (Column # A)    (Column # B)

First, you should make a guess as to what player 1 will be doing. That is, hit Green # A if you think he/she will be choosing the first row or hit Green # B if
you think he/she will be choosing the second row. Guess what move you think the other player will actually make; do not use your green buttons to indicate what you would like the other player to do. Second, you need to make your own choices. If you want to choose column # A, push Red # A or if you want to choose column # B, push Red # B. As you push each of these buttons, you should see the corresponding green or red light turn on to indicate your guess and actual choice.

As both player have made both necessary choices, one of the four white lights will come on to indicate the actual outcome of the trial. That is, the white light that corresponds to the row that player 1 chose and the column that player 2 chose will turn on. You will also see your total points updated on the numeric display on the panel in front of you. When you hear the buzzer, that will be the signal to begin a trial. The procedure will be repeated. This will happen 25 times and then you will be asked to add up your gains and losses. Then a new series will begin. Note that each player can potentially win or lose as much as the other player. However, this will not necessarily happen. Look at the upper right hand square (if you are player #2), or the lower left hand square (if you are player #1). It shows you that the largest win for you (10 points), is coupled with the largest loss (-10 points), for the other person. It should be clear by now that your wins or losses on a particular trial or sequence of trials, depend not only on which choice you make (which button you press), but also on the choice the other player makes.
Of course, neither of you knows what choice the other has made until after you both have made your choices. Then, when the numbers light up, each of you both can tell which choice the other made.

Note that the lights indicate to you alone which choice you have made. The other player cannot see what choice you have made. The other player cannot tell whether you have guessed his move correctly. And the accuracy of your guesses has nothing to do with how many points you win or lose. It is extremely important that you do not attempt to communicate with the other player talking, laughing, or in any way indicating how you feel about what is happening.

ARE THERE ANY QUESTIONS UP TO THIS POINT?

III. REVIEW

1. The buzzer will signal the beginning of a trial
2. Guess the other player’s move
3. Make your own choice
4. Wait for the buzzer again
5. Add up your gains and losses after 25 trials

Please read these instructions over again and ask any questions you may have before we begin. The assistant will be observing both of you to make sure that you do not communicate with the other player by talking, laughing, or in any way indicating how you feel about what is happening!
APPENDIX D

AFFECTIONAL SOLIDARITY (V.L. Bengtson, 1973)

How well do you feel this parent (or child) understands you?

How well do you feel this parent (or child) trusts you?

How fair do you feel this parent (or child) is toward you?

How much respect do you feel from this parent (or child)?

How much affection do you feel this parent (or child) has for you?

How well do you understand him (or her)?

How much do you trust this parent (or child)?

How fair do you feel you are toward this parent (or child)?

How much do you respect this parent (or child)?

How much affection do you have toward this parent (or child)?

Not much □
Not too much □
Some □
Pretty much □
Very much □
Extremely much □
GENERATIONAL INTERACTION

Taking everything into consideration, how close do you feel, in the relationship between yourself and this parent (or child)?

How is communication between yourself and this parent (or child)—how well can you exchange ideas or talk about things that really concern you?

Generally, how well do you and this parent (or child) get along together?

- Not well □
- Not too well □
- Some □
- Pretty well □
- Very well □
- Extremely well □

INTERGENERATIONAL EXCHANGE (FUNCTIONAL SOLIDARITY)

How often do you help him/her out with chores or errands?

How often does he/she help you out with chores or errands?

- Almost never □
- About once a year □
- Several times a year □
- Every other month or so □
- About once a month □
- About once a week □
- Several times a week □
- Almost every day □
INTERGENERATIONAL NORMS (P.L. Heller, 1970)

The young person who lives at home should take on many of the everyday households chores and responsibilities.

The way a person dresses should be entirely his own choice and not a family matter.

A person should talk over important life decisions (such as marriage, employment, and residence) with family members before taking action.

As many activities as possible should be shared by married children and their parents.

Different generations within the same family have problems communicating today because of the rapid change in values in our society.

Family members should give more weight to each others' opinions than to the opinions of outsiders.

Marriage should be regarded as extending established families, not just creating new ones.

If an old man has a medical bill of $1000 that he cannot pay, his son or daughter is morally obligated to pay the debt.

If a person finds that the life-style he has chosen runs so against his family's values that conflict develops, he should change.

Even though it means considerable sacrifice, a parent should finance his or her child's education all the way to completion (through graduate school if necessary).

Strongly Disagree □
Slightly Disagree □
Slightly Agree □
Strongly Agree □
THE AUTHORITARIAN PERSONALITY:
THE CALIFORNIA F-SCALE (Form 45 and 40) (T. Adorno et al., 1950)

Obedience and respect for authority are the most important virtues children should learn.

A person who has bad manners, habits, and breeding can hardly expect to get along with decent people.

If people would talk less and work more, everybody would be better off.

The businessman and the manufacturer are much more important to society than the artist and the professor.

Science has its place, but there are many important things that can never possibly be understood by the human mind.

Every person should have complete faith in some supernatural power whose decisions he obeys without questions.

Young people sometime get rebellious ideas, but as they grow up they ought to get over them and settle down.

What this country needs most, more than laws and political programs, is a few courageous, tireless, devoted leaders in whom the people can put their faith.

No sane, normal decent person could ever think of hurting a close friend or relative.

Nobody ever learned anything really important except through suffering.

What youth needs most is strict discipline, rugged determination, and the will to work and fight for family and country.

An insult to our honor should always be punished.

Sex crime, such as rape and attacks on children, deserve more than mere imprisonment; such criminals ought to be publicly whipped, or worse.
There is hardly anything lower than a person who does not feel a great love, gratitude, and respect for his parents.

Most of our social problems would be solved if we could somehow get rid of the immoral, crooked, and feebleminded people.

Homosexuals are hardly better than criminals and ought to be severely punished.

When a person has a problem or worry, it is best for him not to think about it, but to keep busy with more cheerful things.

Nowadays more and more people are prying into matters that should remain personal and private.

Some people are born with an urge to jump from high places.

People can be divided into two distinct classes: the weak and the strong.

Some day it will probably be shown that astrology can explain a lot of things.

Wars and social trouble may someday be ended by an earthquake or flood that will destroy the whole world.

No weakness or difficulty can hold us back if we have enough will power.

It is best to use some prewar authorities in Germany to keep order and prevent chaos.

Most people don't realize how much our lives are controlled by plots hatched in secret places.

Human nature being what it is, there will always be war and conflict.

Familiarity breeds contempt.

Nowadays when so many different kinds of people move around and mix together so much, a person has to protect himself especially carefully against catching an infection or disease from them.
The wild sex life of the old Greeks and Romans was tame compared to some of the goings-on in this country, even in places where people might least expect it.

America is getting so far from the true American way of life that force may be necessary to restore it.

**SELF-CONCEPT (Rosenberg, 1965)**
I feel that I'm a person of worth, at least on an equal basis with others.

I feel that I have a number of good qualities.

All in all, I am inclined to feel that I am a failure.

I am able to do things as well as most other people.

I feel I do not have much to be proud of.

I take a positive attitude toward myself.

On the whole, I am satisfied with myself.

I wish I could have more respect for myself.

I certainly feel useless at times.

At times I think I am no good at all.
APPENDIX E

PARENT-CHILD RELATIONSHIP STUDY FOLLOW-UP QUESTIONNAIRE

How clear were the instructions presented by the experimenter?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I did not understand</td>
<td>1</td>
</tr>
<tr>
<td>Clear</td>
<td>2</td>
</tr>
<tr>
<td>Very clear</td>
<td>3</td>
</tr>
</tbody>
</table>

Were you concerned with impressing the other person participating in the experiment?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Very concerned</td>
<td>1</td>
</tr>
<tr>
<td>Concerned</td>
<td>2</td>
</tr>
<tr>
<td>Unconcerned</td>
<td>3</td>
</tr>
</tbody>
</table>

How hard did you try to win money that was available in the experiment?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tried very hard</td>
<td>1</td>
</tr>
<tr>
<td>Tried hard</td>
<td>2</td>
</tr>
<tr>
<td>Did not tried hard</td>
<td>3</td>
</tr>
</tbody>
</table>

Were you concerned with the experimenter's evaluation of your performance?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Very concerned</td>
<td>1</td>
</tr>
<tr>
<td>Concerned</td>
<td>2</td>
</tr>
<tr>
<td>Unconcerned</td>
<td>3</td>
</tr>
</tbody>
</table>

If one of the following persons were playing this game, do you think that you would have played the game differently?

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Another relative</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Your best friend</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>One of your neighbors</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>A stranger or foreigner</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Which attitude can be used to better describe the way you both have played:

<table>
<thead>
<tr>
<th></th>
<th>YOU</th>
<th>PARTNER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altruistic</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cooperative</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Competitive</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Neither one</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Which attitude do you think would describe better the goals that you both had:

<table>
<thead>
<tr>
<th></th>
<th>YOU</th>
<th>PARTNER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximizing mutual gain (both scores)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Maximizing your individual gain (your score)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Maximizing your partner's gain (his/her score)</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Were you surprised with your partner's performance during the game?

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Please describe how do you think your partner felt during the experiment?

Please describe any feeling you had in the beginning, in the middle, and towards the end of the experiment (e.g.: anxious, nervous, confused, angry, excited, happy etc.)
BIBLIOGRAPHY


