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Length of Marriage as a Factor in Marital Satisfaction, Communication, and Performance on the Prisoner's Dilemma Game

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BY

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AND PERFORMANCE ON THE PRISONER'S DILEMMA GAME

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CHAPTER I

Introduction.

In the literature on marital success the importance of effective communication between the marriage partners has been noted (Navran, 1967). It has been shown that capacity to communicate correlates positively with marital adjustment (Navran, 1967). It has also been demonstrated that when communication between marriage partners breaks down, not only does the marriage suffer, but all relationships in the family suffer to some degree as well (Matteson, 1974) Another important question is whether the length of time a couple has been married will affect the communicative process. In this study the primary question which will be examined is whether or not length of marriage, marital satisfaction and/or marital communication will correlate with an experimental measure of the communications process. The Prisoner's Dilemma Game (PDG) has been considered to be related to trust and cooperation (Speer, 1972a). It is expected that there will be positive correlations between the style of playing and marital communication and satisfaction. First, a discussion of marital satisfaction, communication and the Prisoner's Dilemma Game will be presented.

Satisfaction in Marriage

Studies have approached the issue of satisfaction in marriage from varying viewpoints, such as whether or not satisfaction in marriage is related to the stage in the "family cycle" the marriage is in (Hicks & Platt, 1970). The results are not consistent. Rollins and Feldman (1970) found an association between marital satisfaction and the stage of the family life cycle, though it was different for the sexes. Generally, the husbands were less affected by the stage of the family life cycle. Both husbands and wives reported a decline in positive companionship experiences from the beginning of marriage to the "preschool" stage when the oldest child is 3-6 years old, and a consistent decline in stimulating common activity. They also found that the child bearing and child-rearing phases were highly related and that a low point was during launching the children from home. They reported an increase in marital satisfaction during the "retirement" stage, which may equal any earlier period, and a temporary setback just before retirement.

Whereas Rollins and Feldman report the association with the family life cycle to be a U-shaped curve, other researchers have reported consistent declines, increases, or no significant pattern of change. Luckey (1966) reports an increase in unfavorable perceptions of the spouse with an

increase in the length of marriage for both happily married and unhappily married couples. They found this to be associated with a decrease in marital satisfaction. Blood and Wolfe (1960) found a decrease in marital satisfaction for wives with the passing decades. However, their conclusions have been seriously questioned by Rollins and Cannon (1974) who gave instruments which measure satisfaction, including the one used in Rollins and Feldman (1960), the Blood and Wolfe (1960) measure, and the Locke-Wallace (1959), to a single sample and found conflicting results. They concluded that since the Locke-Wallace and the Rollins and Feldman measures both found a U-shaped curvilinear relationship that the Blood-Wolfe measure may contain measurement problems. Dentler and Pineo (1960) found that the development of disenchantment was true for only 20% of the husbands in his study. Paris and Luckey (1966) found that satisfied couples tended to decrease and unsatisfied couples tended to increase in satisfaction with time, but that the general trend was to decrease, and more so for wives than for husbands. Gurin et al. (1960) found a curvilinear trend in which marital satisfaction decreased during the early stages, leveled off, then increased during later stages. They reported the low point to be just before retirement, the "empty nest" period. An increase in marital happiness, with a concomitant

decrease in marital tension, was reported by Bradburn and Caplovitz (1965), and no significant change was reported by Bossard and Boll (1955). Indeed there is discrepancy in conclusions of a general trend of marital satisfaction as related to length of marriage.

One possible cause for this confusion may be that current studies are not specific enough about what has been measured when they refer to marital happiness and adjustment. For instance, Burr (1970) used six specific measures for measuring marital satisfaction rather than a general measure. He measured satisfaction with a) the way finances are handled, b) social activities, c) tasks, d) companionship, e) sex, and f) children. He concluded that the findings that marital satisfaction decreases over the life cycle, and that the period just prior to the launching of the children is the most difficult, should be viewed with less certainty, because it may depend on what is being measured. Brinkerhoff and White (1978) found that satisfaction with the standard of living increased over the family life cycle, particularly in the latter stages while satisfaction with companionship decreased over early stages followed by an increase over later stages. Gilford and Bengtson (1979) also found varying trends in marital satisfaction. They found a curvilinear trend in positive interaction and a linear

declining trend in negative sentiment. These terms denote how couples responded on various questions designed to indicate positive or negative sentiments. Their approach views human behavior in a relationship as based on profit in terms of positive sentiment. This is derived from an exchange-theory perspective. The implication is that a global measure of marital satisfaction may be unsatisfactory because there may be many trends of increasing or decreasing satisfaction concurrently existing in any marriage and that a single measure may hide this, as Burr (1970) has suggested. Whether or not these global or specific measures vary over the length of marriage due to changed circumstances, or to a sense of adjustment over time has not been tested. Another problem in examining this issue is the frequency with which measurements of the couple's satisfaction should be taken. For instance, Pineo (1961) concluded from his longitudinal study that a process of disenchantment takes place in marriage. However, he took measurements only three times during twenty years. The first was taken during engagement, the second at 4-5 years, and the final at twenty years. This may not allow enough information to discern a reliable trend. It has also been noted that the couples in his study at the twenty year mark were probably at the peak of their

parental responsibilities which may be correlated with less marital satisfaction (Miller, 1976).

The more often used means of studying this issue is the cross-sectional method rather than the longitudinal method presumably because of the difficulties inherent in a longitudinal study.

Many factors have been investigated for their possible relationship with marital satisfaction. These include finances, sex, companionship, social activities, tension, perception of spouse, children, and so on. There is not general agreement on these. A factor which is more generally agreed on as being positively correlated with marital communication was shown in a study by Locke, Sabagh, and Thomes (1956), who reported a positive correlation between marital satisfaction and adjustment, and communication. Navran also suggested that "communication and marital adjustment are so commingled that any event having an effect on one will have a similar effect on the other" (Navran, 1967, p. 183). In his study he found that happily married couples were differentiated from unhappily married couples in that they:

> (a) talk more to each other, (b) convey the feelings that they understand what is being said to them, (c) have a wider range of subjects available to them,

> (d) preserve communication channels and keep them open, (e) show more sensitivity to each other's feelings, (f) personalize their language symbols, and (g) make more use of supplimentary techniques of communication. (Navran, 1967, p. 182)

Levinger and Senn (1967) found a positive correlation between full disclosure of feelings and marital satisfaction. This disclosure of feelings was even more positively correlated with good feelings about the other person. However, Cutter and Dyer (1965) found that open talking about violations of expectations does not always lead to adjustment. Though there may be topics, or methods of communication which do not lead to adjustment, for the most part communication seems to be an aid to adjustment and positivley correlated with marital satisfaction.

Prisoner's Dilemma Game

The third variable which was examined in this study is the individual's response on the PDG. The PDG is a two-person, non-zero sum, mixed-motive game which may be played for points, money, chips, etc. The original anecdote from which this game is developed is given by Rapoport and Chammah (1965, p. 831). The typical PDG has a 2 x 2 matrix of response payoffs and is constructed so that a person can moderately increase both players' scores, greatly increase his

own score while not increasing his opponent's, or slightly increase both of their scores. The payoffs, as well as the matrix itself, can be manipulated in any way desired. Those matrices which contain negative payoffs have also been called "dangerous" games or "Chicken." This is because the response which holds the greatest potential gain also has the greatest potential loss (see Figure 1). The players are not typically allowed to communicate with one another.

A vast amount of literature has accumulated involving the PDG. Most of the studies have dealt with characteristics of the game rather than characteristics of the players (Speer, 1972a). Vinacke (1969), in a review of the literature, identified three aspects of the PDG which have been studied. These are task variables, situational variables, and personality variables. Task variables are properties of the task itself. This includes what the players must do, the matrix, the number of trials, and so on. The situational variables are the environmental conditions under which the subject acts. This includes the instructions given to the players, the possible strategies for playing, the possibilities for communication, opponent characteristics, and rewards. Personality variables are characteristics of the players and are not really part of the game, such as the sex of the players. The review of PDG literature will be broken

Figure 1

Game Matrices

Typical PDG

player 1 \ player 2	A	B
A	3, 3	0, 5
B	5, 0	1, 1

"Dangerous" Game

player 1 \ player 2	A	B
A	1, 1	-1, 2
B	2, -1	-2, -2

Matrix used in this study

player 1 \ player 2	A	B	C	D
A	3, 3	0, 5	-2, 0	-2, -2
B	5, 0	1, 1	-1, 0	-2, -2
C	0, -2	0, -1	-1, -1	-2, -2
D	-2, -2	-2, -2	-2, -2	-3, -3

down into these categories. First, a short discussion of the level of cooperation in the PDG.

Much attention has been given to the level of cooperation in the PDG and the factors which can affect it. The typical level of cooperation is from 20% to 40% using a standard matrix (Oskamp & Perlman, 1965). This low level of cooperation seems to be reliable. Though the PDG seems to resemble many real life situations in its structure it does not correspond to real life behavior. Komorita (1965) claims that in real life situations initial increasing amounts of cooperation are found and high levels of cooperation are found beyond the early stages. This is contrary to the preponderance of non-cooperative choices found in the PDG. Many variables have been examined in an effort to understand and manipulate cooperation. However the results are often conflicting perhaps because of the complexity of the situation and the number of variables at play (Vinacke, 1969).

Task Variables

Vinacke (1969) includes the matrix, length of run, and mode of presentation as task variables.

The extreme index values have been shown to be related, and to possibly cause, high proportions of competition (Steele & Tedeschi, 1967). For this reason Steele recommends

that medium levels of payoffs be used when studying other variables in the PDG. Rapoport and Chammah, 1965, were able to increase cooperation by increasing the "cooperative" (AA) payoff, decreasing the BB payoffs, and decreasing the discrepancy of payoff in AB and BA. Vinacke (1969) finds that the level of cooperation is much more a function of the relationships between choices than of the particular payoff values used.

The results which have been reported concerning the effect that the length of run has on levels of cooperation have been variable. Jones et al. (1968) found that cooperation decreased as a function of time over 150 trials. Rapoport and Chammah (1965), however, found an initial decrease and then an increase. Morehous (1966) found an increase in cooperation in longer runs, however, the maximum number of trials in this study was 10.

Another task variable is the mode of presentation. Evans and Crumbaugh (1966) varied the presentation of the payoffs; one group of players were presented the payoffs in matrix form, the other in a non-matrix form. They found the non-matrix group cooperated considerably more than those who had the standard matrix. Pruitt (1967) increased cooperation by using two decomposed matrices, the total scores of which equaled the parent matrix. These matrices showed

where the points were coming from in each play, that is, how many are from one's own choice, and how many are from the other's choice. This suggests that the subject's perception of the situation is a relevant factor. Kanouse and Wiest (1967) found that those who thought the game situation presented a dilemma were more likely to make competitive responses than those who claimed that the game posed no dilemma.

Situational Variables

The situational variables include strategies, instructions, communication between partners and the type of reward for playing.

McClintock (1972) listed three major motives which subjects gave in the PDG: a) to maximize one's own gain (individualism), b) to maximize the joint gain (cooperation), or c) to maximize the relative gain (competition).

In order to study the effect of strategy simulation techniques have been employed in which the experimenter, a confederate, or a computer carries out a specified type of response (Vinacke, 1969). McClintock, et al. (1963) used 15%, 50%, and 85% cooperation and found little difference. Komorita (1965) found that subjects did not reciprocate cooperative choices by their partners. Swingle and Coady (1967) had confederates make 100% cooperative choices for

the first 50 trials then switched to 0%, 25%, 50%, or 100% cooperative choices. This resulted in increased variability in strategy, though the mean number of cooperative choices was not significantly affected.

The instructions given to players have been manipulated to examine that variable. The general trend in PDG is to attempt to keep the instructions given as neutral as possible in order to leave the player free to develop his own strategy for playing. Words such as "opponent," "partner" and even "game" are often avoided in order to maintain neutrality in giving instructions as was done by Speer (1972a).

Instructions which label the experiment as dealing with cooperation and competition had no effect (Oskamp & Perlman, 1965). Kanouse and Wiest (1967) found that a cooperative instructional set increased cooperative responses. Perhaps, merely labeling the experiment one way versus another does not create a strong enough "set" to alter playing style as actually altering instructions can. Deutsch (1958, 1960) altered playing styles through pregame instructions in which he emphasized making as many points as possible for a) the dyad (cooperation), b) the individual (individualistic), and c) the relative gain (competitive). Komorita (1965) found that unless instructed not to, Ss were likely to consider the purpose of the game to be to beat the other player.

This may account for the strong tendency to compete found in so many studies.

In most PDGs communication is not allowed. It would seem that this factor, as well as the fact that most players in PDGs do not know their opponents, would tend to increase competitive responses. It has been found that increased communication leads to increased cooperation (Swensson, 1967; Loomis, 1959; Deutsch, 1958; Scodel, Minac, Ratoosh, & Lipitz, 1959). Some forms of feedback, as well, increased cooperation (Vinacke, 1969). However, keeping a cumulative score so that a player can judge his relative standing increased competition (Vinacke, 1969).

Jones, et al. (1968) report that the form of payoff makes a difference. They found that those playing for real money averaged winning $9.92 per game, whereas, those playing for imaginary money lost $38.80 per game. This conflicts with findings by Wrightsman (1966) and by Evans (1964). Wrightsman did not find that game behavior was affected by real versus imaginary money. Vinacke (1964) found that game behavior was very similar with monetary rewards or with points; this study, however, was not conducted on the PDG.

Personality Variables

Personality variables which have been addressed in PDG research include: sex of the players, pre-existing relationships between the players, and, in one case, the type of college from which the samples were drawn.

There is little or no consensus on the effect that the sex of the player has on the Prisoner's Dilemma Game behavior. Vinacke (1969) reports that a higher level of cooperation for males was found by Bixenstine, Chambers, and Wilson (1964), Bixenstine and Wilson (1963, Oskamp and Perlman (1965), and Rapoport and Chammah (1965). No sex difference was found by Fry (1967), Kanouse and Wiest (1967), Miller (1967), or Lutzker (1961).

Very little has been done with the PDG which involved dyads composed of persons with some existing relationship. Swingle and Gillis (1968) found that cooperation was more likely when subjects played someone they liked. Oskamp and Perlman (1965) found no effect due to friendship, in the range from unacquainted to fairly friendly. However, in another study, Oskamp and Perlman (1966) found that friends at a liberal arts college showed an increase in cooperation, whereas friends at a business school showed an increase in competition! They hypothesized that the increase in cooperation or competition could be related to the type of student attracted to and produced by the different institutions.

In summary, many different variables affect game behavior and it is possible to increase cooperation through the manipulation of some of them (Vinacke, 1969). However, the level of a player's cooperation is complex and sensitive to a number of factors (Oskamp & Perlman, 1966), but the variables have not been adequately tested (Vinacke, 1969). As a result there have been conflicting findings.

Scoring the PDG

The most frequently used method of scoring the PDG is a simple computation of the percentage of trials in which an individual emits a given response. This is known as a cumulative monadic measure. Speer developed another system of scoring called sequential dyadic measures, which was shown by him to be "more frequently related to psychometric measures of marital communication and adjustment than are cumulative monadic measures" (Speer, 1972b, p. 293). This measure is a probability of a player emitting a specific choice or response given the response he and his partner made on the preceeding trial. An example of this is A/AB; this is the situation where player one plays an A given that on the previous trial player one played an A and player two played a B. This method of scoring is more interactive than a simple percentage of accumulated responses because it takes into account the preceeding trial. This measure is newer

than a simple percentage, therefore less work has been done involving it.

Purpose of the Study

The purpose of the present study was to examine the relationship between length of marriage, self ratings on the Locke-Wallace Short Marital Adjustment and Prediction Tests, the Primary Communication Inventory, and the Prisoner's Dilemma Game. The two questions which this study investigated were: a) the relationship between the amount of time a couple has been married and marital communication and marital satisfaction, and b) the relationship between the length of marriage, marital satisfaction and marital communication with the couple's performance on the PDG.

CHAPTER II

Method

This study consisted of 30 married couples with two couples attending each session. During the session they were briefed about the purpose and procedure of the experiment, trained to play the PDG, played the PDG, answered the questionnaires, and were then debriefed about the experiment.

Subjects

The sample consisted of 30 couples ranging in the length of time they had been married from 2 months to 532 months with a mean of 107.07 months and a standard deviation of 127.24 months. The couples were obtained by canvassing several local churches as well as psychology undergraduate courses.

Procedure

Couples were run in pairs so that there were two couples per session. The couples were taught to play the PDG and allowed to practice until they were familiar with the scoring and the use of the score card. They were then taken to separate clinic rooms which could be observed through one-way mirrors and the experimenter was able to communicate with them through an intercom. Thus, each person

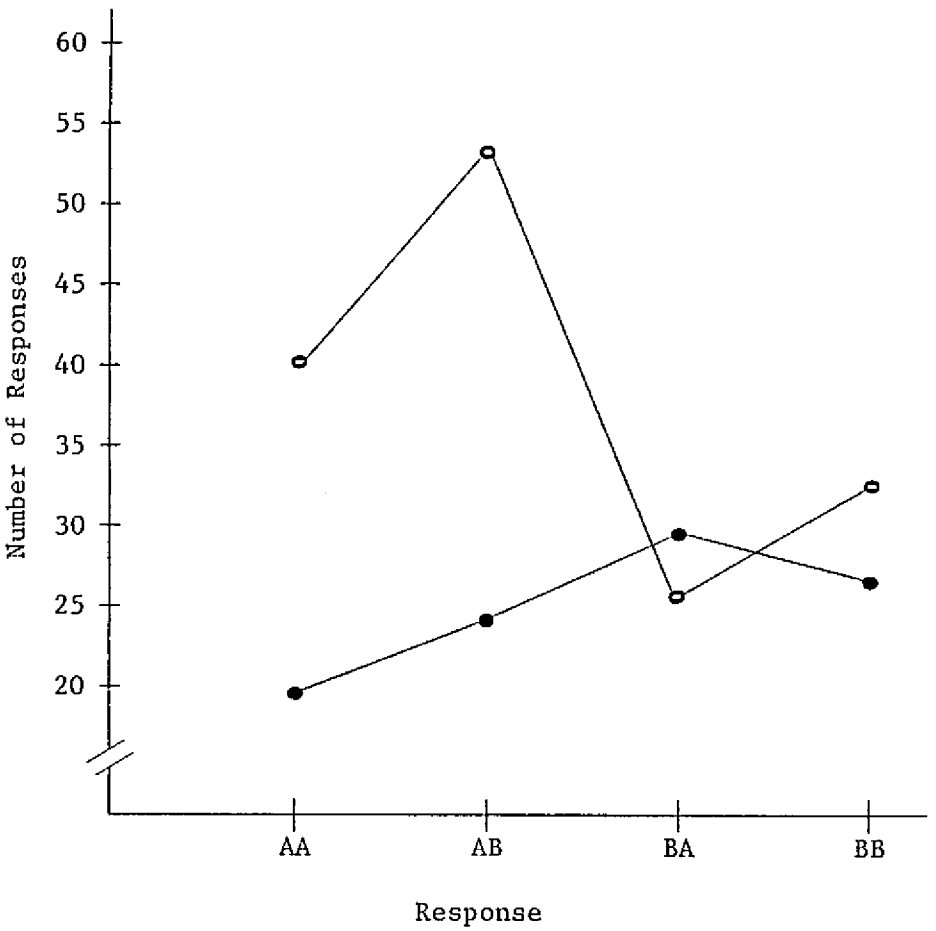
was prevented from knowing the other player. Playing the PDG consisted of 80 trials per game. Then, two of the individuals were exchanged to make new partners and another game was played. Each person played their spouse in one game and the opposite sex partner from the second couple in the other game. They then each completed the Locke-Wallace Short Marital Adjustment and Prediction Tests (Locke & Wallace, 1959) and the Primary Communication Inventory (PCI) (Navran, 1967). They were then told the entire purpose of the study, which concluded their involvement in the study.

The PDG in this study used a four-choice matrix. The "A" response was the typical cooperative or trust response. The person who made this response came out ahead only when the other player also made a cooperative choice, otherwise they came out behind. The "B" response was the typical competitive, defective, or exploitative response. This response could greatly increase one player's score while reducing the partner's score, if the partner made a cooperative choice. The "C" response was a punish-self-and-other response, which resulted in both players losing points. The "D" response was a no-play or withdrawal response which neutralized or overrode any choice by the other player, which resulted in an equal loss for both partners. Figure 2 shows the layout for the PDG in the experiment.

Figure 2

Cell Means for Sequential Dyadic

Measures of the PDG



The design of the study is a 2 x 2 x 4 split-plot factoral with repeated measures.

Materials

The Locke-Wallace Short Marital Adjustment and Prediction Tests are two short, scaled answer questionnaires which have been found to have approximately the same accuracy as the longer, more complex marital adjustment and prediction tests (Locke & Wallace, 1959). The reliability coefficient computed by the split-half technique and corrected by the Spearman-Brown formula is .90 for the adjustment test and .84 for the prediction test.

The Primary Communication Inventory (PCI) (Navran, 1967) is a twenty-five item questionnaire. The five scaled answers range from very frequently to never. The scoring system used is one created and used by Navran (1967) which yields total, verbal, and non-verbal scores.

The PDG was played on a wooden game board 38 cm square, divided into four equal sections 9.5 cm square. The sections were marked A, B, C, and D. A red, square "ring" was placed in the appropriately marked square to indicate the player's choice on a particular trial.

CHAPTER III

Results

The means and standard deviations of all the variables used are given in Tables 1, 2, and 3. The ANOVAs performed on the PDG are summarized in Tables 4 and 5.

For the tallies of individual responses on the PDG, that is, the total number of any given response on the PDG by a dyad, the within-subjects A response was significant, $F(3, 870) = 30.33$, $p < .01$. The within-subjects B response was significant, $F(3, 870) = 31.89$, $p < .01$. However, there was a significant interaction between the A and the B response, $F(9, 870) = 6.48$, $p < .01$. A posteriori testing of the interaction cell means using the Newman-Keuls procedure indicated that the BB response occurred more often than the AA, AB, or BA and the differences were significant at $p < .01$.

The sequential dyadic measures which were examined were: A/AA; A/AB; A/BA; A/BB; B/AA; B/AB; B/BA; B/BB. Therefore, there are two possible responses by player one, A or B, given one of four possible combinations of responses by the dyad on the proceeding trial. The A or B response of player one's is referred to as the level 2 response and the combination of plays on the preceeding trial is referred to

Table 1

Means and Standard Deviations for the Sequential Dyadic Measures of the PDG in Percentages

Married Couples

	A/AA	A/AB	A/BA	A/BB	B/AA	B/AB	B/BA	B/BB
$\bar{X}$	22.16	22.89	31.26	27.72	44.23	57.34	25.87	30.36
S.D.	25.49	25.95	28.67	27.47	33.98	32.60	33.80	31.59

Non-Married Couple (female from the married couple)

	A/AA	A/AB	A/BA	A/BB	B/AA	B/AB	B/BA	B/BB
$\bar{X}$	14.38	29.77	17.58	21.77	37.89	52.70	30.82	39.01
S.D.	25.01	32.04	29.64	27.07	35.69	36.12	36.57	32.66

Non-Married Couple (male from married couple)

	A/AA	A/AB	A/BA	A/BB	B/AA	B/AB	B/BA	B/BB
$\bar{X}$	17.90	19.77	36.53	26.84	34.04	48.41	20.33	32.36
S.D.	26.83	26.27	34.88	30.28	30.29	36.63	23.85	40.37

Table 2

Means and Standard Deviations for the Tallies of Responses

on the PDG in Number of Responses

Married Couples

	AA	AB	AC	AD	BA	BB	BC	BD	CA	CB	CC	CD	DA	DB	DC	DD
$\bar{X}$	7.57	6.93	3.70	3.27	7.17	12.70	5.73	3.07	4.37	5.90	3.83	1.70	3.77	3.80	2.97	3.53
S.D.	5.05	3.60	2.88	2.42	4.80	13.31	4.59	2.27	3.82	3.19	2.98	1.51	3.61	3.24	2.86	2.99

Non-Married Couple (female from married couple)

	AA	AB	AC	AD	BA	BB	BC	BD	CA	CB	CC	CD	DA	DB	DC	DD
$\bar{X}$	4.40	7.27	3.67	3.60	5.00	13.87	5.87	5.07	2.60	5.40	5.40	3.33	2.47	5.13	3.27	3.60
S.D.	3.83	4.45	3.09	2.44	5.40	9.30	3.58	3.96	2.50	3.09	4.47	2.64	2.90	7.65	3.58	4.36

Non-Married Couple (male from married couple)

	AA	AB	AC	AD	BA	BB	BC	BD	CA	CB	CC	CD	DA	DB	DC	DD
$\bar{X}$	7.33	6.73	3.20	2.13	9.33	11.13	7.00	3.67	4.60	6.40	5.20	1.73	2.67	3.40	2.53	2.87
S.D.	7.09	4.73	2.60	3.23	7.60	8.95	7.14	2.66	3.25	6.27	4.51	2.22	1.95	2.53	2.26	3.87

Table 3

Means and Standard Deviations for the Married Couples' Lengths of Marriage, Scores on the Locke-Wallace Short Marital Adjustment and Prediction Tests and the Primary Communication Inventory

Length of Marriage	
$\bar{X}$	107.07
S.D.	127.24
Minimum	2.00
Maximum	532.00

Locke-Wallace

	Adj. F.	Pred. F.	Adj. M.	Pred. M.
$\bar{X}$	120.53	307.03	120.90	324.13
S.D.	19.46	64.23	18.95	54.53

PCI

	Total F.	Verbal F.	Non-V. F.	Total M.	Verbal M.	Non-V. M.
$\bar{X}$	100.87	73.40	27.43	99.37	71.20	28.17
S.D.	8.39	6.85	6.24	8.69	6.91	3.08

Table 4

Summary of 2 x 2 x 4 Split-Plot ANOVA for PDG Tallies

Source	SS	DF	MS	F
Between Subjects				
Couple	0.004	1	0.004	2.07
Subject within groups	0.12	58	0.002	
Within Subjects				
"A" Response	2181.64	3	727.21	30.33**
"B" Response	2384.80	3	794.93	31.89**
"A" Response x "B" Response	1397.99	9	155.33	6.48**
"A" Response x Couple	45.34	3	15.11	0.63
"B" Response x Couple	71.14	3	23.71	0.99
"A" Response x "B" Response x Couple	41.49	9	4.61	0.19
"B" Response x Subject within Groups	20863.48	870	23.98	

**$p < .01$.

Table 5

Summary of 2 x 2 x 4 Split-Plot ANOVA for

Sequential Dyadic Measures of the PDG

Source	SS	DF	MS	F
Between Subjects				
Couple	891.38	1	891.38	1.01
Subject within groups	51396.76	58	886.15	
Within Subjects				
Level 2[1]	22358.02	1	22358.02	23.51**
Level 4[2]	9419.44	3	3939.82	3.30*
Level 2 x Couple	5.49	1	5.49	0.006
Level 4 x Couple	1010.10	3	336.70	0.35
Level 2 x Level 4	19811.29	3	6603.76	6.94**
Level 2 x Level 4 x Couple	1287.29	3	429.10	0.45
Within Subject Error	386180.01	406	951.18	

*$p < .05$

**$p < .01$

[1]Note: Level 2 = A or B response.

[2]Note: Level 4 = AA, AB, BA, BB

as the level 4 response. The level 2 response was significant, $F(1, 406) = 23.51$, $p < .01$. The level 4 response was significant, $F(3, 406) = 3.30$, $p < .05$. However, there was significant interaction between the level 2 and level 4 responses which indicates that a person's performance was affected by the combined performance of both players on the previous trial. The Newman-Keuls procedure showed the A/AA response to have occurred significantly more often than the B/AA. The B/AB response occurred significantly more often than the A/AA, A/AB, A/BA, A/BB, B/BA, and B/BB responses. The cell means showed that the combined score of AA or AB was followed more often by a response of B than of A by player one. However, for the BA and BB responses this did not occur so often, as seen in Figure 2.

The couple factor, that is, married versus non-married persons was not significant nor were the interactions involving the couple factor. This result would seem to indicate that the couples could not be differentiated from the non-couples when the PDG is scored using sequential dyadic measures or tallies.

A T-test was performed on the sequential dyadic measures for the couples game with the non-couples game. The non-couples game consisted of the female from the couples game with the male from the other couple. No significance

was found. A T-test was performed on the tallies of the responses on the PDG for couples and non-couples. The CC and DA responses were significant at $p < .02$ and $p < .03$, respectively.

No correlations were found between the sequential dyadic measures and length of marriage, the Locke-Wallace tests, or the PCI. Correlations between the tallies and these variables were found for several of the various responses on the PDG. These are shown in Table 1.

There were no significant correlations between any of the sequential dyadic measures of the PDG and any of the measures of marital satisfaction, adjustment, or communication, as shown in Table 6. There were, however, 11 significant correlations between simple tallies of scores on the PDG and the measures of satisfaction, adjustment and communication, as shown in Table 7. Length of marriage correlated with the number of BD and CA responses with correlations of -0.37 and 0.42, respectively. The CA response also correlated with the Locke-Wallace prediction scores for the males at 0.37. The rest of the correlations were with the females' scores on the tests. The AA response correlated at -0.38 with the females' total PCI score; it also correlated at -0.45 with the verbal score on the PCI. The AC response correlated with the females' non-verbal score on the PCI at

Table 6

Correlations of the Married Couples' Sequential Dyadic Measures with the Self-Report Measures

	A/AA	A/AB	A/BA	A/BB	B/AA	B/AB	B/BA	B/BB
Length of Marriage	0.20	-0.09	-0.02	-0.16	0.02	0.20	-0.25	-0.001
Locke-Wallace Adj. Fem.	0.10	-0.03	0.10	0.08	0.09	0.21	0.16	0.04
L-W Pred. Fem.	0.24	-0.17	-0.04	0.13	0.23	0.33	0.17	0.20
L-W Adj. Male	0.14	-0.004	-0.03	0.16	0.14	0.12	0.25	0.04
L-W Pred. Male	-0.24	-0.24	-0.25	-0.27	0.30	0.09	-0.01	-0.09
PCI Total Fem.	0.15	-0.05	0.13	-0.27	-0.03	0.20	0.05	0.27
PCI Verbal Fem.	0.07	-0.02	0.18	-0.26	-0.06	0.16	-0.04	0.20
PCI Non-V. Fem.	0.30	-0.10	-0.03	-0.17	0.07	0.22	0.27	0.32
PCI Total Male	0.09	-0.04	0.03	-0.25	0.04	0.13	0.06	0.15
PCI Verbal Male	0.11	-0.02	0.07	-0.19	0.04	0.11	0.06	0.15
PCI Non-V. Male	0.004	-0.08	-0.07	-0.29	0.04	0.13	0.16	0.09

Table 7

Correlations of the Married Couples' Tallies

with the Self-Report Measures

	AA	AB	AC	AD	BA	BB	BC	BD
Length of Marriage	0.22	-0.15	-0.22	-0.08	0.08	-0.12	-0.28	-0.37*
Locke-Wallace Adj. Fem.	-0.15	0.09	0.12	0.17	-0.16	-0.01	0.19	0.28
L-W Pred. Fem.	0.06	0.28	0.24	0.33	0.07	-0.11	0.32	0.13
L-W Adj. Male	0.03	0.16	0.24	0.07	0.11	-0.17	0.30	0.32
L-W Pred. Male	-0.15	-0.14	-0.20	-0.12	0.23	-0.001	-0.05	0.14
PCI Total Fem.	-0.38*	-0.09	0.13	0.15	-0.26	-0.05	0.26	0.26
PCI Verbal Fem.	-0.45*	-0.03	0.001	0.13	-0.28	-0.04	0.22	0.31
PCI Non-V. Fem.	-0.07	-0.20	0.37*	0.17	-0.10	-0.06	0.23	0.06
PCI Total Male	-0.31	-0.07	0.003	0.10	-9.16	-0.05	0.19	0.15
PCI Verbal Male	-0.24	0.02	-0.07	0.18	-0.14	-0.05	0.19	0.15
PCI Non-V. Male	-0.34	-0.25	0.16	-0.10	-0.13	-0.01	0.10	0.09

*$p < .05$

Table 7 (continued)

Correlations of the Married Couples' Tallies

with the Self-Report Measures

	CA	CB	CC	CD	DA	DB	DC	DD
Length of Marriage	0.42*	-0.07	0.20	-0.16	0.34	0.17	-0.01	0.06
Lock-Wallace Adj. Fem.	-0.03	0.03	0.32	-0.13	-0.29	-0.27	0.001	0.08
L-W Pred. Fem.	-0.01	-0.31	-0.05	0.04	-0.15	-0.38*	-0.15	-0.08
L-W Adj. Male	-0.08	-0.04	0.27	-0.20	-0.27	-0.15	-0.28	0.08
L-W Pred. Male	0.37*	-0.04	-0.19	-0.29	0.09	0.22	-0.10	-0.03
PCI Total Fem.	0.01	0.21	0.41*	0.33	-0.44	-0.001	0.09	0.18
PCI Verbal Fem.	-0.01	0.28	0.36*	0.35	-0.44*	0.05	0.20	0.16
PCI Non-V. Fem.	0.05	-0.09	0.36*	0.14	-0.28	-0.12	-0.21	0.19
PCI Total Male	0.06	0.11	0.29	0.21	-0.30	0.26	-0.15	0.20
PCI Verbal Male	0.05	0.04	0.31	0.23	-0.28	0.22	-0.13	0.17
PCI Non-V. Male	0.27	0.23	0.15	0.07	0.20	0.26	-0.14	0.18

*$p < .05$

0.37. The CC response, both being attack responses, correlated with all the measures of the PCI, the total, verbal and non-verbal measures for the females. These correlations were 0.41, 0.36, and 0.36, respectively. The DA response correlated negatively with the women's verbal PCI at -0.38 with the females' Locke-Wallace Prediction scores.

CHAPTER IV

Discussion

The most important finding of this study is that the variable, length of marriage, did not prove to be a relevant factor in relationship to the PDG. It did not correlate with any of the self-report measures of marital adjustment and prediction or with communication. Nor was it found to correlate with performance on the PDG as measured by the sequential dyadic measures. Apparently, a person's rating of his or her marital adjustment, communication as well as the way in which they perform on the PDG is not altered as a function of the time spent in marriage. If there are any adjustments in a couple's interaction which come with time, then these measures are not sufficient to show them. What has been measured does not seem to differentiate with time spent in marriage.

Not only did the self-report measures not correlate with length of marriage, but no significant correlations were found between them and the sequential dyadic measures of the PDG. However, counter to expectations, several significant correlations were found between the simple tallies of responses on the PDG and the self-report measures.

The tallies were related to the cumulative monadic measures of the PDG because the tally is simply the number of times a particular response was made, whereas the cumulative monadic measure is a percentage, that is, the number of times a particular response was made divided by the total number of trials times 100. Speer (1972b) has suggested that the sequential dyadic measures of the PDG were more frequently related to measures of marital adjustment and communication than were the cumulative monadic measures. This did not prove to be true in this study. In the same article Speer suggested that the experimental forms of the PDG were also more sensitive to these measures. This study did use one of his experimental forms, but correlations were still not found. The present study and his followed essentially the same procedure. The reason for this discrepancy of results is now known. It is suggested that one possible reason may have to do with the minimum number of a particular response which was allowed before a sequential dyadic measure was calculated. Speer required eight, but not all couples in this study gave that many responses.

The performance on the PDG did not differentiate couples from non-couples. The reason for this finding is most likely due to the fact that the persons did not know whether they were playing a spouse or another opponent.

Marriage alone was not a strong enough factor to alter the playing style when they were not aware of who they were playing. However, two of the tally responses did differentiate couples from non-couples, the CC and DA responses. This may suggest that the tally is a more sensitive measure than the sequantial dyadic measures. Although with only two responses out of sixteen being significant, this conclusion may not be reliable. Replication is required here.

An additional problem with the present study was that in some dyads of players a particular response was never emitted. It was hoped that at least five responses of each type would be made but this was not always the case even with 80 trials. The measures, either sequential dyadic or tallies, may not be reliable with fewer than five responses.

Another problem encountered in the study was that some persons were confused by the ambiguity of the game situation. The PDG offers no direct strategy for winning or losing; that must be defined by each individual. However, this lack of structure was difficult for some individuals to accept and for some, resulted in what appeared to be unmotivated playing as evidenced by the subjects' never looking at the score card, playing a repeating pattern of plays, or making random moves. This would make those results less likely to

correlate with the self-report measures, and certainly more dubious.

The complexity of the PDG and the prevalence of a lack of agreement on the various factors affecting performance on it call to question its usefulness as a measure of dyadic interaction. There is general lack of agreement in the literature about the role of the sex of the partners, the mode of presenting the PDG matrix, the payoffs, the number of trials, and so on (Vinacke, 1969). It will take a great deal of experimentation to unravel these conflicting findings in an empirical way. Speer (1972a) also suggests that couples playing the experimental forms of the game may take much longer than those playing the standard game to realize the self-defeating and paradoxical nature of continuing to make "defective" responses. He noted that the salience of the central paradox and dilemma may be lost in the more complex three- and four-choice matrices. The subject may not be able to comprehend the meaningful aspects of the game. The four-choice matrix was used in this study and this may have been a problem.

The results of the present study suggest that the sequential dyadic measure may not be a more appropriate measure than the cumulative monadic measures or, possibly than mere tallies, for studying marital adjustment and communication.

Replication of this aspect of the study is suggested since this finding conflicts with the previous findings of Speer (1972b).

There were some significant correlations between several of the tallied responses on the PDG and the self-report measures. They were: AA with females' total and verbal PCI scores (correlated negatively), AC with females' non-verbal PCI score, length of marriage with BD (correlated negatively) and CA, CA with the males' Locke-Wallace prediction scores, CC with the females' total, verbal, and non-verbal PCI scores (correlated negatively), and DB with the females' Locke-Wallace prediction score (correlated negatively). It is interesting to note that the females' self-report scores correlated more often than did the males'. This may indicate that the females' self-report responses may be measured more effectively by the PDG. Also, most of the correlations found were with the PCI. Perhaps the most interesting finding was that most of the correlations involved at least one member of the dyad making the "defective" choice of either C (punish or attack response) or D (punish-self-and-other response). The only correlations involving both players making the A (cooperative response) were negative. No clear explanation for this finding is known. However, one could speculate that the reason communication

tended to correlate positively with competitive responses could be that those couples who communicate well may feel safer in their marriage and therefore are free to compete in games, whereas couples who do not communicate as well may not be secure enough to compete, therefore they cooperate. Whatever the cause, it is possible that the CC, BD, and DA responses hold some promise of being responses which will reliably correlate with these self-report measures because of their correlation with them and because they were able to differentiate couples from non-couples even when the players were not aware of whom they were playing.

Further investigations need to be made in order to discover if there is a reliable correlation between these self-report measures and performance on the PDG as measured by both sequential dyadic measures and cumulative monadic measures, or simple tallies. If so, this would indicate that it may be plausible to find a behavioral measure which validates some of these self-report measures used in this study.

In conclusion, it was found that length of marriage was not a significant factor in the variables used. It was also found that the PDG is a highly complex situation involving many variables which are not yet properly understood. Much of the previous work done with the PDG has not used designs which varied in only one way from previous experiments.

Therefore, the literature is full of conflicting results, which makes information on the PDG unreliable. This can only be rectified through extensive testing, varying one variable at a time. Also, the issue of the best way to score the PDG remains in question.

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