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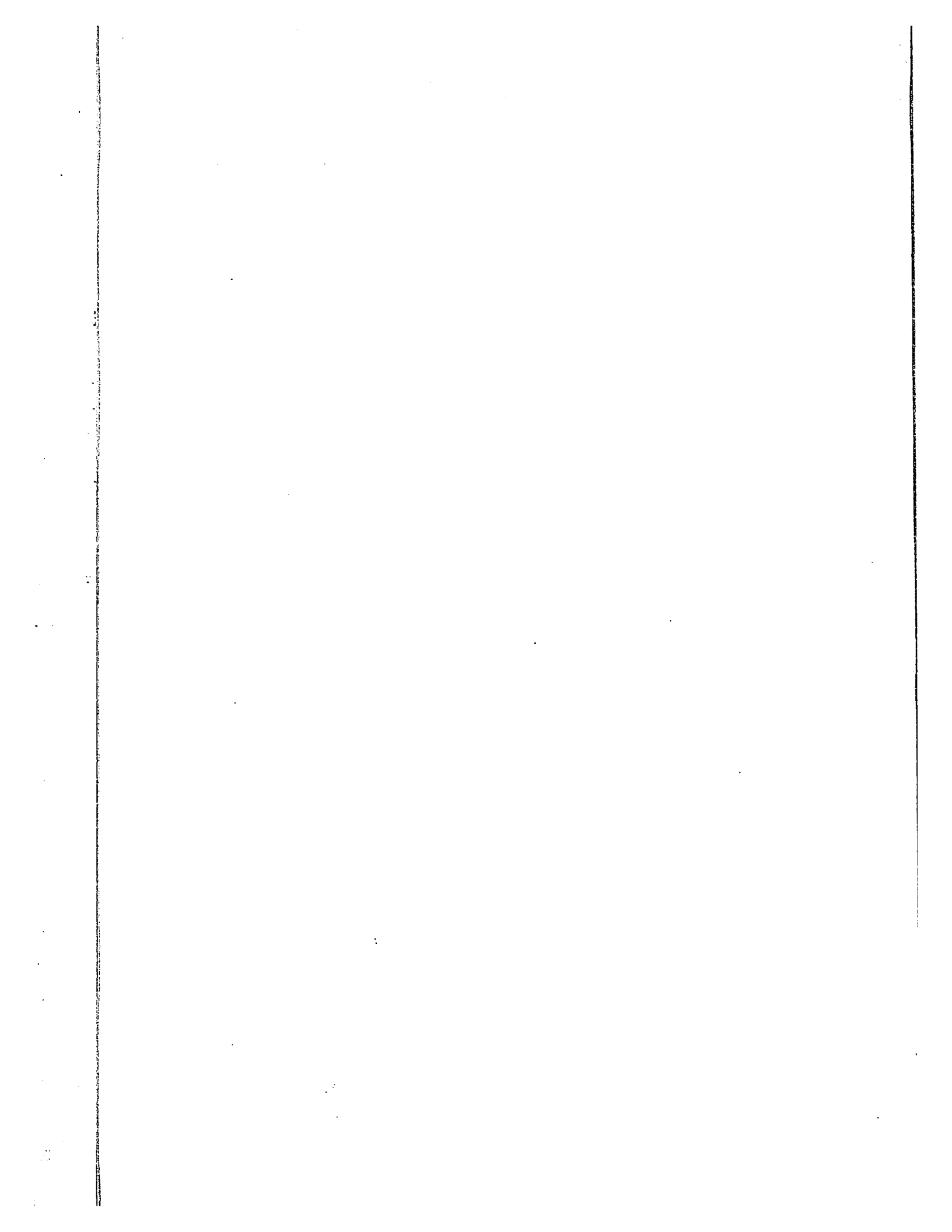
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FIELD-DEPENDENCE-INDEPENDENCE AND COMPETITIVE
BEHAVIOUR IN THE PRISONER'S DILEMMA GAME SITUATION

Karen E. Kerr

Thesis presented to the School of Graduate
Studies of the University of Ottawa as
partial fulfillment of the requirements
for the Degree of Master of Arts in
Education



K.E. Kerr, Ottawa, Canada, 1978

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CURRICULUM STUDIORUM

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INTRODUCTION

Individuals frequently find themselves in a variety of situations which involve some degree of intrapersonal or interpersonal conflict. It is their perception of the situation which will determine how individuals will act or react to this conflict.

Differences in individual responses in such situations are also associated with personality predispositions. Within this realm of personality, two stable types of individuals have been identified, namely cooperative and competitive personalities. Each type is associated with stylistic consistencies which lie along a dimension from cooperation at one pole to competition at the other. It has been found that these two types of individuals have different views of their world.

The work of Witkin concerning psychological differentiation has resulted in the identification of consistent stable personality characteristics as well. The field-dependence-independence dimension has been shown in the literature to be related to a variety of performance characteristics and strategies. Extensive investigation and replication by others has led to the development of reliable measuring instruments which can be used to determine the cognitive style of individuals.

Similarly, extensive research has been carried out to investigate the behaviour of individuals in conflict type situations. Formal games have been developed as probing tools for such investigations. One such game which predominates the literature is Prisoner's Dilemma (PD). The strategies used in this game are readily defined and easily determined as they are directly linked to the outcome of the game.

INTRODUCTION

By paralleling research findings from both areas of investigation many theoretical links can be found between the degree of psychological differentiation of an individual and his interactive mode when confronted with a conflict situation as presented by the Prisoner's Dilemma game.

It is from the similarities in findings that the present investigation has grown. Broadly speaking, this study lies within the area of cognitive style and formal game behaviour. More specifically, it seeks to examine the nature of and the extent to which performance on the Prisoner's Dilemma game is related to field-dependence-independence.

Statement of the problem. It is the purpose of this research to determine if a relationship exists between the degree of psychological differentiation of an individual and his interactive style of coping in a conflict situation.

CHAPTER I

REVIEW OF THE LITERATURE

The first section of this chapter outlines the nature of field-dependence-independence as presented by Witkin and his associates (1962, 1967, 1973, 1977). The second part reviews the literature concerned with the behaviour of individuals when confronted with a specific conflict situation as presented by the Prisoner's Dilemma game. An attempt is then made to establish the theoretical basis for the present study. The chapter is concluded with a statement of the problem followed by the experimental hypotheses.

Witkin's Concept of Psychological Differentiation

Witkin's theory grew out of observations of individual differences on perceptual tasks developed to detect an individual's spatial orientation skills. One such perceptual task is the Rod and Frame Test (RFT) (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962). The apparatus consists of a luminous rod pivoted at the centre of a luminous square frame. The subject is seated in a completely darkened room and is required to adjust the position of the rod to the true vertical. The experimenter is able to independently tilt the position of the rod and the frame. The subject is required to adjust the rod to the true vertical under conditions where the rod and the frame are tilted in the same or opposite directions. Also, the experimenter is able to tilt the chair in which the subject is sitting. The subject's score on this task is based on the absolute deviation of his settings from the true vertical

under several conditions of body, frame, and rod tilt. Witkin found that individuals differed considerably on their scores on the RFT. The performance range on this test falls between two poles. At one extreme is the individual who determines the upright position of the rod in accordance with the surrounding frame. At the other end is the individual who can adjust the rod to the upright independently of the position of the surrounding frame.

Witkin assumed that the basis for performance on this task was the ability to overcome an embedding context. This ability enables an individual to ignore irrelevant aspects of a situation in order to concentrate on the attributes which determine correct performance. Specifically, this ability would enable an individual to disregard the misleading influences of the tilted frame or his tilted body in order to concentrate on the rod and set it at the true vertical.

Witkin also studied the relationship between scores on the RFT and two other perceptual tasks both assumed to be measures of the ability to overcome an embedding context. These are the Body Adjustment Test (BAT) and the Embedded Figures Test (EFT) (Witkin et al., 1962).

In the BAT the object of perception is the body itself. In this test a subject is placed in a room which can be tilted. His chair can be tilted independently or together with the room. The subject is required to set his chair to the true vertical while the room remains tilted under conditions in which the room and the chair are initially tilted in the same or opposite directions. The subject's score on this test is based on the absolute deviation of his chair settings from the true vertical. In this test the context which must be overcome is the

tilted room. The subject must attend to cues from his body while ignoring the visual appearance of the room.

The Embedded Figures Test (EFT) involves a different approach from the other two tests. After having been shown a simple figure the subject is to locate it in a complex geometrical figure. The standard test consists of twenty-four figures of varying degrees of difficulty. A maximum of five minutes is allowed on each trial. The subject's score is based on the length of time required to find the simple figure on a series of trials based on the different figures. Witkin (1973, p. 4) states that what is at issue is the extent to which the surrounding visual framework dominates perception of an item within it.

On all these tests, individuals tend to be self consistent in performance. That is, if an individual is tested on all three situations and tends to tilt the rod far towards the tilted frame he is likely to tilt his body far towards the tilted room and also to take a long time to locate the simple figure in the complex design (Witkin, 1973).

Each of the tests mentioned above require the subject to perceptually differentiate an item from the influence of the surrounding field. Each test is quantifiable such that a combined score can be obtained for all three tests. This combined score is called the perceptual index. Witkin considered the subject's degree of accuracy in the various tasks to be associated with a field approach mode which he termed the field-dependent-independent dimension. A more field-independent style is associated with greater accuracy. Furthermore, the consistent performances of subjects on these tests were considered to support the contention that field-dependence-independence is a stable aspect of an individual's perceptual

process.

It is this difference in perceptual functioning that provides the basis for the linkage of field approach to many other characteristics of individuals. The theoretical link is provided by Witkin's concept of differentiation which is based on Werner's orthogenic principle. According to Werner (1948), "an increasing differentiation and refinement of mental phenomena and functions and a progressive hierarchization may be accepted as a basic principle" (p. 51).

The contention is that differentiation is developmental, proceeding from a global or undifferentiated state toward a more differentiated, hierarchical structure. Degree of differentiation of a system then refers to the complexity of its structure. A highly differentiated system is composed of many heterogeneous and specialized subsystems. Witkin et al., (1962) describe the consequences of differentiation for psychological systems as follows:

When used to describe an individual's psychological system specialization means a degree of separation of psychological areas, as feeling from perceiving, thinking from acting. It means as well specificity in manner of functioning within an area. Specific reactions are apt to occur in response to specific stimuli as opposed to diffuse reaction to any of a variety of stimuli. Parts of a perceptual field are experienced as discrete, rather than fused with their background. Impulses are channelized, contrasting with the easy 'spilling over' characteristics of the relatively undifferentiated state. More or less discrete feelings and needs are likely to be present.

(...) With respect to relation with the surrounding field, a high level of differentiation implies clear separation of what is identified as belonging to the self and what is identified as external to the self. The self is experienced as having definite limits or boundaries. Segregation of the self helps make possible greater determination of functioning from within, as opposed to a more or less enforced reliance on external nurturance and support for maintenance typical of the relatively undifferentiated state. (pp. 9-10)

Thus, Witkin's perceptual index is in effect a measure of the extent to which an individual's systems are differentiated. This follows from the assumption that a more differentiated person would be expected to perform in a field-independent manner achieving an analytic perception of the environment and to make distinctions which permit him to segregate items from the context in which they are embedded.

The concept of differentiation has been examined from a developmental viewpoint. Witkin et al. (1962, p. 22) found that there was a tendency for young children to be relatively more field-dependent in their mode of perception. With increasing age the characteristic mode of perception becomes increasingly more field-independent. A further expectation is that individual children of the same chronological age would differ in the extent of differentiation. Furthermore, studies have demonstrated a marked stability in field approach over many years (Witkin, 1973). Although differentiation in perceptual functioning, especially from 5 to 17 years, increases with age, each individual tends to maintain the same relative position within the group (Witkin, Goodenough & Karp, 1967).

Sex differences in field-dependence-independence have also been reported. There is a greater tendency for females to be field-dependent (Witkin, Moore, Goodenough & Cox, 1977). This holds across groups having varied educational, socio-economic and cultural backgrounds. Such findings have been found to be consistent across countries and continents as well, including the United States, England, Holland, Italy, France, Israel, Japan, Africa, and India (Witkin, et al., 1967). It is of interest that no significant sex difference in field-dependence

have been found among the Eskimo. Eskimo child-rearing practices emphasize self-reliance and independence for both boys and girls (MacArthur, 1969).

Also, developmental studies have revealed that sex differences may not exist in children before the age of 8 or in adults above 60 years of age (Witkin, et al., 1962).

In perceptual and intellectual functioning, males tend toward an analytical approach while females tend toward a global approach. Females tend to show a greater dependence on others defining their attitudes and judgements by external standards (Witkin, Moore, Goodenough, & Cox, 1977).

Witkin et al. (1962) sum up the findings of their own research as well as those from other researchers who utilized the same or closely related techniques. This provides a profile of the perceptual characteristics of field-dependence-independence.

Field-dependent people require a significantly longer time in locating a familiar figure concealed in a complex design. Such stimuli are usually experienced as vague and indefinite. They tend to have difficulty with the block-design, picture completion, and object assembly parts of standard intelligence tests but on the other hand, they may even surpass field-independent persons on sections dealing with vocabulary, information and comprehension.

Field-independent people present a different picture. Such individuals tend not to have any difficulty with embedded-figures tests. They also have greater success with the analytical portion of intelligence tests.

Witkin contends that what is an issue here is the person's characteristic approach to a wide range of situations. This is called his 'style'. Since this approach pervades both perceptual and intellectual activities it is referred to as cognitive style (Witkin, Note 1).

The preceding discussion has been concerned with perceptual and intellectual functioning. There also exists extensive evidence that field-dependence-independence permeates other psychological domains. For example, Witkin (Note 1) contends that persons who are relatively field-dependent are likely to utilize the existing social frame of reference in which they presently find themselves in defining their attitudes, beliefs, feelings, and self-views. He then cites results from other researchers who support this contention. For example, when forming attitudes on an issue field-dependent individuals have a strong tendency to be guided by the attitude of an authority figure or peer group (Bell, 1964; Deever, 1967; Linton & Graham, 1959). Since field-dependent individuals rely on external sources of information for self-definition then they are selectively attentive to the human content of the environment. As a result, they spend more time looking at the faces of those with whom they are interacting (Konstadt & Forman, 1965; Nevill, 1971; Ruble & Nakamura, 1972). Also, reflecting their attention to the social environment field-dependent individuals are superior to field-independent persons in attending to and remembering verbal messages that are more social in content (Eagle, et al., 1966; Eagle, et al., 1969; Fitzgibbons & Goldberger, 1971; Fitzgibbons et al., 1965; Goldberger & Bendich, 1972).

The above observations lead to a description of Field-dependent persons as being particularly sensitive and attuned to the social environment having

a repertoire of highly developed skills (Witkin, Note 1).

Prisoner's Dilemma Game Research

Before attempting to inquire into the possible relationship between field-dependence-independence and interactive style an effort will first be made to survey some of the relevant studies dealing with the behaviour of individuals in conflict situations.

Several studies in the literature have been directed toward understanding the psychological nature of individuals by examining their behaviour in formal game situations. One such game called Prisoner's Dilemma (PD) represents a mixture of interpersonal and intrapersonal conflict. The dilemma is inherent in the structure of the game. An individual is torn between a tendency to cooperate, so as to promote the common interests, and a tendency to compete, so as to enhance his own individual interests.

On the surface the game is simplistic. But it is this attribute that allows it to be a way of examining the behaviour of individuals in conflict situations. For example, if one was interested in examining an individual's strategy then the game itself must specify what an individual could do in every conceivable situation in which he may find himself in the course of the game. In the PD game the possible strategies are represented by a matrix as shown in Figure 1. Also once both players have chosen a strategy the outcome of that particular play is immediately determined. Since the payoffs on the matrix are symmetrical in that they look exactly alike from the point of view of each player then the payoffs corresponding to each outcome depend only on how the players have chosen.

		Player 2	
		A	B
Player 1	A	5 5	-10 10
	B	-10 10	-5 -5

Figure 1. The Prisoner's Dilemma Game

The name Prisoner's Dilemma is derived from the original anecdote used to illustrate the game (Rapoport & Chammah, 1965, p. 24). Two prisoners held incommunicado are charged with the same crime. They can be convicted only if either confesses. Further, if only one confesses, he is set free for having turned state's evidence for which he is also given a reward. The prisoner who has held out is convicted on the strength of the other's testimony and is given a more severe sentence than if he also confessed. Therefore, it is in their collective interest to hold out. The dilemma is that each is torn between a tendency to cooperate, so as to promote the common interests, and a tendency to compete, so as to enhance his own individual interests.

The numbers on the matrix represent the payoffs associated with all possible strategies. The upper portion of each cell is the payoff associated with player two. The dilemma is that a player's payoff is

determined by his own and his partner's choice. For example, for either player to achieve the maximum outcome (10) on any given trial he must choose the B response while the other player chooses A. If the game is to be played over an extended period of time a solution is for each player to make the A response on each trial, yielding a moderately high outcome (5) to each player on each trial. This choice is frequently called the cooperative choice. The B choice is usually referred to as the competitive choice since its use allows the individual the possibility of his maximum outcome while guaranteeing the other player a low outcome.

Rapoport and Chammah (1965, pp. 56-57) express a number of reasons why such a simple game can be useful in examining the behaviour of individuals. The authors first argue that if personality factors are going to emerge in a test situation then the more realistic the simulation is, the more the participants may be aware of the actual artificiality of the situation and consequently behave in ways unrelated to the ways they would behave in real life. Secondly, they contend that the triviality of the game may tap the players psychological propensities more thoroughly than attempted reproductions of real life situations. Thirdly, it is not immediately apparent to the subject for what he or she is being tested. Even if an individual realizes that choosing A or B is essentially a choice between cooperation and competition the consequence of either choice is not clearly apparent. Fourthly, decisions must be made quickly. This tends to prevent a change in behaviour because of a thought out policy. The authors concluded that the patterns of responses in this game contain a good deal of spontaneity so that the situation may tap some

basic attitudes and propensities in a significant way. It would seem therefore, that a search for personality correlates of performance in a PD situation would be worthwhile.

The following is a review of the type of information that has been obtained about individuals from experiments dealing with the Prisoner's Dilemma game.

Even if a player realizes the advantages of both players choosing cooperatively, it is difficult to establish joint cooperation. Researchers have shown that merely increasing the frequency with which one chooses cooperatively does not produce increasing cooperation from one's partner (Bixenstine, Potash, & Wilson, 1963).

Marlowe (1963) sought to determine whether personality variables are related to the disposition to cooperate and maximize joint gain. In this experiment subjects played with a confederate. The confederate made a cooperative choice on every trial. The subjects had two choices to either cooperate with him or exploit his cooperative overtures. From the results, consistent and extreme non-cooperators and consistent cooperators were selected. Measures of need aggression and autonomy, and need abasement and deference were obtained. Results indicated that non-cooperators scored higher on need aggression ($p < .06$) and autonomy ($p < .03$) while cooperators scored higher on need abasement ($p < .07$) and deference ($p < .02$). Marlowe (1963) concluded that personality factors do have an influence on decision making in a prisoner's dilemma type game in that aggressive-independent subjects were less cooperative than passive-dependent subjects.

Hottes and Kahn (1974) examined sex differences with respect to performance on PD. Their findings suggested that males tend to ignore

attributes of the social situation and respond solely on the basis of strategic considerations cooperating when playing with a partner who imitates their choices and competing with a randomly responding partner. The authors' explanation for the results concerned itself with a differential socialization for males and females. Their suggestion was that males are primarily oriented towards winning or achieving while females are more oriented towards social and interpersonal concerns.

McClintock, Harrison, Strand, and Gallo (1963) were also concerned with a personality dimension, internationalism versus isolationism. Their research was based on previous findings by Lutzker (1960) who found that individuals strongly internationalistic in their personal orientation towards the political world were more likely to select the cooperative alternative than those who were strongly isolationistic. McClintock et al., (1963) suggested that when the opportunity to increase their own gains occurs isolationists will utilize it even though it means decreasing the other person's gains.

Pilisuk, Potter, Rapoport and Winter, (1965) offered explanations for some repeated observations concerning PD results. One recurring observation is that on repeated trials a pair of players generally establishes a stable relationship. Pairs generally fall into either a cooperative pattern or a non cooperative pattern from which they depart only rarely. The authors suggested that "the significance of this lock in phenomenon lies in the degree to which the game represents a micro-simulation of interpersonal behaviour. Two individuals are obliged to make a series of behaviours which affect their partner's well being as well as their own. Eventually, large numbers of pairs develop a stable

interaction pattern which defines them as a social unit" (p. 492).

The authors go on to suggest that this 'lock in' of behaviour could be the result of the matching of traits between partners. Furthermore, the question still remains as to why it is that although members do come to resemble one another why is it that the resemblance is cooperative (Dove type) behaviour in some cases and competitive (Hawk type) in others? One single personality variable seemed to offer better differentiation of criterion groups. Pair members who were both high on tolerance for ambiguity were more likely to become Doves than were pairs lower on this variable ($p < .01$). Other patterns also developed. If a pair had even a single early experience where both made a cooperative gesture on the same trial, that pair was likely to become a cooperative pair. Where gestures of cooperation were not reciprocated increased competition resulted. The authors made a further suggestion that players bring to the game setting certain predispositions to react in certain ways to the contingent circumstances presented by the other player's behaviour. They concluded that personality traits should be viewed as contingent reaction propensities.

A study by Kelley and Stahelski (1970) was concerned with the basis of a cooperator's and competitor's beliefs about others. The procedure was to let the subjects set goals for themselves in the game and then interact in pursuit of these goals. The experimenters were interested in what perceptions individuals would have of one another's goals, what errors of perception would occur, and what would account for these errors.

On the basis of original goal choices (cooperative-"I will try to cooperate with the other player and will be concerned with my own score

and the other player's score", and competitive-"I will work for myself against the other player, and will be concerned only with my own score") individuals were then paired off with different goal choices (e.g., cooperative versus cooperative, cooperative versus competitive, and competitive versus competitive). After a series of trials subjects were interrupted and asked for their judgements of each other's goals.

The most common kind of error in perception of goal occurred in the cooperative-competitive pairs and consisted of a judgement by the competitor that his cooperative partner was also a competitor. This was explained in terms of a behavioural shift by the cooperative member. This specifically related to the perception by the competitor of the goal or intentions his partner had for their relationship at the outset. Competitors failed to judge accurately what the cooperator's choice had been, even though they might be said to have given an accurate account of how he had been behaving in their recent interaction. The cooperative member was aware of the dominant role played by the competitor. The shift in behaviour was described as a temporary means of adapting to a competitive adversary.

The authors in summary state that the cooperator was behaviourally assimilated to the competitor. The competitor had a low rate of cooperative behaviour, and his rate was fairly uniform regardless of the type of partner. In contrast, although the cooperator's rate of cooperation was higher, it varied markedly according to the type of partner. The cooperator clearly made fewer cooperative moves when paired with a competitive partner than when he played another person like himself.

In another part of the same study the experimenter attempted to

induce the competitive subjects to be cooperative. But this had little effect. On the other hand cooperators induced to compete readily returned to their original level of cooperation. This rebound effect suggests that cooperators merely change their behaviour in the face of the competitive partner and readily reassert their interest in establishing a cooperative relationship when the partner becomes similarly inclined.

These results imply that cooperators and competitors develop different views of what people are like. Specifically, cooperators are aware of heterogeneity in outlook-that some people are cooperative, but others are competitive. In contrast, competitors tend to assume that other people are uniformly competitive.

To summarize Kelley and Stahelski's (1970) research the following statements can be made. Each person has a manner of orienting himself when placed in a dilemma type situation. He adopts this manner whenever the situation arises.

A follow up study by Miller and Holmes (1975) supported the previous findings. They replicated Kelley and Stahelski's (1970) study using a PD game. They also chose to use an expanded Prisoner's Dilemma Game (EPD). This game has similar mixed motive characteristics but has one more response. This additional move is a withdrawal or defensive response which would enable players with cooperative orientations to avoid both behavioural assimilation and exploitation when confronted by a player with a competitive orientation. The authors felt that such a response is often available to people in everyday social relationships.

The most thought provoking finding from their study is that individuals who considered the PD situation to be most representative of everyday social relationships classified themselves as more competitive, more dominant and somewhat stronger than those who judged the EPD to be more representative. The authors' data could not account for the difference but they did attempt to offer explanations.

One suggested explanation was that cooperators and competitors have differential experience with the types of situations that the two games represent. They thought that competitors may have more experience with restrictive, forcing situations while cooperators might have more experience with unrestrictive situations. The suggestion was that individuals "may seek out situations compatible with their orientation, or alternatively, people's orientations may be shaped by the type of situation they generally find themselves in" (Miller & Holmes, 1975, p. 672).

A second possible explanation that was presented is that individuals tend to perceive situations in a direction consistent with their dispositions. It was suggested by Miller and Holmes (1975) that "cooperators would seem less likely to be able to see defensive possibilities that were not in fact there" (p. 672).

Miller and Holmes (1975) concluded with the following:

It must be remembered, of course that in many instances people do not have any constraints or formal rules for interaction imposed upon them. Often the participants themselves define the structure of the relationship and delimit the boundaries and values of the interaction. In these situations it does not seem at all unreasonable to expect people to create interpersonal matrices in their own images. (p. 673)

This statement pertaining to a view of the world directly parallels

Witkin et al., (1962) statement concerning a sense of separate identity. It was stated that a sense of separate identity "implies as well a self that is structured; internal frames of reference have been formed and are available as guides for definition of the self and for viewing, interpreting, and reacting to the world" (p. 134).

It is on the basis of this first link that findings from PD research will next be re-examined to determine if any further parallels to findings dealing with a global or analytical style exist.

It is first necessary to examine the origins of cooperation and competition as forms of interaction. Both are thought to be learned forms of behaviour closely related to cultural forces and child-rearing practices (Madsen, 1967). It appears that the tendency to cooperate or compete arises not only from learning and experience, but it is also intimately related to self-concept, attitudes and needs (Jersild, Telford & Sawrey, 1975, p. 252).

Evidence accumulated from cross cultural studies similarly demonstrates that development of a more field-dependent or field-independent cognitive style is related to socialization processes and learning (Witkin, 1973). Furthermore, Witkin (1973) summarizes field-independence as a "manifestation in the perceptual sphere of a broad dimension of personal functioning which extends into the sphere of social behaviour and into the sphere of personality as well" (p. 8).

Within this realm of personality there are two stable types of individuals which may be described approximately as cooperative and competitive personalities. These stable individual differences lie along a dimension from cooperation to competition (Kelley & Stahelski, 1970).

Similarly, field-dependence-independence is also described as a continuum. The tendency towards an analytical or global way of perceiving characterizes a person's perception in a wide variety of situations making for marked individual self-consistency (Witkin, 1973).

These two types (cooperators, competitors) have different views of their world, specifically of what other people are like with respect to this dimension (Kelley & Stahelski, 1970).

A personality disposition acts through its influence upon the individual's social behaviour to determine the information he gains from his social environment and thereby the beliefs he comes to hold about his world (Kelley & Stahelski, 1970).

Along these same lines there are definite clusters of behaviours in field-dependence-independence. These reflect the quality of the person's experience of his surroundings, his way of perceiving and using his body, the nature of his relation to other people, and aspects of his controls and defenses (Witkin, 1973).

So far it seems that underlying the possible connection between field-dependence-independence and cooperative or competitive behaviour is, first of all, the degree to which a given interactive situation calls for the particular cognitive skills involved in either style. Contributing to the connection as well are the personal characteristics associated with these cognitive styles.

Field-dependent individuals are likely to change their stated views on a particular social issue in the direction of the attitudes of an authority (Witkin et al., 1962, p. 3). Similarly, such individuals tended to be influenced by the examiner's attitude toward them. They

changed their performance as a function of the variation in the examiner's attitude (Witkin et al., 1962 p. 155). On the other hand those with a more analytical approach tend to be less dependent on the examiner for both definition of the task and their role in it. They are regarded by others as socially more independent, showing less interest and need for people, and a relatively intellectual and impersonal approach to problems. Furthermore, they are usually less influenced by authority (Witkin et al., 1962, p. 156).

This orientation towards authority can be compared to a similar orientation of cooperators and competitors. As previously stated, Marlowe (1963) concluded that personality factors do have an influence on decision making in a prisoner's dilemma type game. Aggressive-independent subjects were found to be less cooperative than passive-dependent subjects.

Another characteristic of field-independent individuals is that they are less attentive to subtle social cues given by others. "In general their attitudes, feelings and needs are developed and discrete and do not easily become fused with the matrix of attitudes feelings and needs of others" (Witkin et al., 1962, p. 156). Within the same group there has been identified an emotionally hard subgroup who maintain distance from others and lack of interest and empathy for people (Witkin et al., 1962, p. 144). Dymond (1950) described empathy as the imaginative transposing of oneself into the thinking, feeling and acting of another. She went on to state that there is a good deal of individual variation in this ability. Some individuals seem very sensitive to cues as to how others are feeling and reacting while others appear to be grossly unaware of the thoughts

and feelings of others.

Knowles and Saxberg (1971) identified the importance of this ability as far as cooperation is concerned. Cooperation is based upon mutual feelings of trust, friendship attachment and interest between individuals. For both parties these feelings are a result of and are augmented by self-awareness and sensitivity to each other and to the situation requiring cooperation. Finally, Johnson (1974) found that there exists a strong relationship between the disposition to cooperate and the ability to take the emotional perspective of other individuals.

There seems to be definite links between cooperative and competitive behaviour and field-dependence-independence. Kelley and Stahelski (1970) are first of all talking about world views in the manner that these two 'types' view social situations. Field-dependence-independence is also a characteristic way of perceiving and problem solving. Prisoner's Dilemma is a problem solving situation. Secondly, an analytic style of functioning is associated with a stable self-view such that one is less at the mercy of situational determinants and of evaluations others make of him (Witkin et al., 1962, p. 154). In the research that has been reviewed here it appears that cooperators in fact change their characteristic style of functioning at that time (Kelley & Stahelski, 1970). Although competitors can take the social perspective of others they can not take the affective perspective (Johnson, 1974). This could imply a characteristic of an analytical person who is described as being relatively intellectual having an impersonal approach to problems. A further link can be found in the behavioural shift by the cooperator. Cooperation is a complex social skill. Global individuals are particularly sensitive and

attuned to the social environment. The result, overall, is a picture of highly developed social skills (Witkin, 1973, p. 9). Finally, Miller and Holmes (1975) suggested that individuals tend to perceive situations in a direction consistent with their dispositions. Of most significance is their statement, quoted previously in this review, that in many situations there are no formal rules or constraints. In such instances the individuals themselves often define the structure, set the boundaries and values of the interaction. It was suggested that competitors perceive interaction matrices. In other words competitors impose structure on the situation which is the ability of field-independent individuals.

The next section of this review will be concerned with research describing what occurs when there is a match or mismatch of individuals with either a global or analytical way of perceiving, or a cooperative or competitive manner of interacting.

Witkin's 1973 paper cites a number of studies concerned with the match or mismatch of cognitive style. The results of DiStefano's (1970) study provides evidence concerning the consequences of a match or mismatch in cognitive style between teachers and students. Teachers and students matched for cognitive style described each other in highly positive terms. On the other hand, those who were mismatched showed a strong tendency to describe each other negatively.

Similarly, Greene (1972) found that patients from patient-therapist dyads, which were matched for field-dependence-independence, tended to rate the therapist's relation toward them more positively than patients from dyads which were not matched in cognitive style. Also, in matching field-dependent therapists with field-dependent patients there occurred

a much higher rate of interaction between patient and therapist.

Shows (1968) examined another kind of social interaction. In this task an interviewer was to find out all he could about an interviewee in twenty minutes. Partners considered similar reported that they viewed each other as more sympathetic; they were more interested in each other, and they found it easier to understand one another. It was suggested that in the finding of better understanding between matched individuals there is also the suggestion of more effective communication (Witkin, 1973, p. 35). Furthermore, the effect of cognitive style on mutual attraction or dislike functions even after a very short period of interaction.

Witkin (1973) summarizes this aspect of the review by stating that relatively field-dependent persons are especially sensitive to the social surround. Their shared tendency to attend selectively to the social content of the environment is likely to help two people of this kind to get along better when they interact. Similarly, when two field-independent persons interact, their shared interest in the more impersonal, abstract aspects of their surround should again make for a positive outcome in feelings toward each other. (p. 37)

Marcus (1970) looked at a specific aspect of communication. She examined the tendency for persons differing in their rate of speech to adapt their rate to each other as a function of field-dependence. Her findings revealed that this matching of speech rates came about through the action of the relatively more field-dependent partner.

In summary, Witkin (1973) suggested that these observations imply that certain aspects of communication are associated with cognitive style.

From studies employing Prisoner's Dilemma type games similar results of match and mismatch have been obtained. Kelley and Stahelski (1970) reported that mixed pairs have been found to be characterized by as much

or more conflict as pairs both of whose members are inclined to be competitive.

Hottes and Kahn (1974) found that individuals tend to cooperate when playing with a partner who imitates their choices and to compete with a randomly responding partner.

The findings reported in the previous section show that similar results occur when there is a match or mismatch of individuals with either a field-dependent-independent way of perceiving, or a cooperative or competitive style of interacting.

Summary and Basic Hypothesis

In the previous pages an attempt has been made to examine the concept of field-dependence-independence as put forth by Witkin and his associates (1962, 1967, 1973, 1977). A number of studies concerned with cooperation and competition have also been reviewed. Possible linkages between the two concepts have been suggested which point to certain expectations concerning the behaviour of field-dependent and field-independent individuals when confronted with a conflict situation as presented by a Prisoner's Dilemma type of game.

Basic Hypotheses

Because of the nature and characteristics previously described field-independent individuals will make more competitive moves than will field-dependent individuals. As a result, when paired with another field-independent individual competition should predominate the interaction. When field-dependent individuals are matched significantly fewer competitive

moves will be made. Finally, when there is a mismatch of styles conflict will result and a greater number of competitive responses will be made.

The above hypotheses can be restated in researchable form as follows:

1. FI individuals will make a significantly greater number of competitive responses than FD individuals.
2. A match between FI-FI individuals will result in a significantly greater number of competitive responses than a FD-FD match.
3. A match between FI-FD individuals will result in a significantly greater number of competitive responses.

CHAPTER II

EXPERIMENTAL DESIGN

The purpose of the present study was to examine the relationship between psychological differentiation as defined by Witkin and interactive style of coping in a conflict situation. In Chapter One the theoretical rationale for the study was presented. A description of the Prisoner's Dilemma Game (PD), the experimental situation, was also provided in Chapter One. This chapter describes the experimental procedures that were involved to test the stated hypotheses. The first two sections of this chapter describe the sample and the measuring instruments that were employed. A justification of the two instruments used to measure psychological differentiation is also presented. Also included are the procedures followed in the administration of the testing instruments and the explanation given to subjects concerning the PD game. The final section sets forth the plan for the analysis of the data.

The Sample

The sample included 84 individuals (Forty-four females and forty males) over nineteen years of age. They were drawn from a variety of academic and occupational backgrounds such as university students, technicians, high school teachers and individuals involved in an adult retraining program.

The Measuring Instruments

The dependent variable was the strategy choice (cooperative or competitive) used by subjects during a series of trials of the Prisoner's Dilemma game. The independent variable was the degree of a subject's psychological differentiation.

The Measurement of Psychological Differentiation

Two instruments were selected to operationally define this variable. These were the Oltman Rod and Frame Test (ORFT) and the Hidden Figures Test Form V (HFTV).

Oltman (1968) has developed a portable rod and frame apparatus which does not require a darkened room or elaborate facilities. It can be operated in a fully illuminated room. Oltman found a Spearman-Brown split half reliability coefficient of 0.96 for a sample of eighty-three female and eighty male college undergraduate students. He also reports a correlation of 0.90 and 0.89 between this instrument and Witkin's original RFT. One researcher using a sample of eighty graduate education and psychology students, found a split half reliability coefficient of 0.90 ($p < .01$). He also cites a test-retest reliability coefficient of 0.85 ($p < .01$) (McCarrey, Note 2).

The Hidden Figures Test Form V, was the other measure of psychological differentiation used in the present research. Jackson, Messick & Myers (1964) report a correlation of 0.84 ($p < .01$) between this test and Witkin's original individual test. Furthermore, Stelmack (Note 3) also reports a test-retest reliability coefficient of 0.67 ($p < .01$) for the same instrument.

Based on the reported levels of reliability and validity, both the Oltman Rod and Frame Test and the Hidden Figures Test Form V were chosen as research instruments for the present investigation.

The Prisoner's Dilemma Game

Chapter One contains a description of the Prisoner's Dilemma Game. At that time justification for the selection of this game as the experimental situation was also presented. Briefly, those points consisted of the following: 1) The dilemma or conflict situation is created by the game. An individual is in conflict between a tendency to cooperate to promote common interest or compete to enhance his own interests, 2) The game board specifies all possible strategies on a matrix, 3) The outcome of each trial is known immediately, 4) Direct communication between players can be prevented, 5) Play decisions must be made quickly allowing for spontaneity, 6) The apparent triviality of the game may tap players psychological propensities more thoroughly than more realistic simulations and 7) The underlying purpose of the game is not immediately apparent to the participants.

Procedures Followed in Administration of the Testing Instruments

As indicated in Appendix 1 the Hidden Figures Test Form V was administered by the researcher. The test was timed for ten minutes in strict accordance with the instructions.

Individuals were also given the Oltman Rod and Frame Test. The exact procedures followed are provided in Appendix 2.

The scores obtained from the HFTV were utilized when matching individuals for the PD game. The FI group was composed of individuals who had four or less figures incompleated. The FD group was composed of individuals who had not completed ten or more figures. From these two groups individuals were next assigned to one of the following three cells: 1) FD-FD, (2) FI-FI and (3) FI-FD.

Within each cell individuals were randomly assigned a partner with whom they would play the Prisoner's Dilemma Game. Participation schedules were established. Individuals were not informed as to who their partner would be.

The complete instructions given to subjects prior to playing Prisoner's Dilemma is presented in Appendix 3.

Plan of the Statistical Analysis

The following consists of a brief description of the statistical procedures used in the analysis of the data. Correlations were calculated for scores obtained on the HFTV and ORFT.

The mean number of competitive responses was computed for each cell.

The research hypothesis was tested in the null form by means of a T-test of significance between independent means with the dependent variable the strategy choice and field-dependence-independence the independent variable.

Due to the size of the sample and the nature of the study it was decided to establish the level of significance at ($p < .05$).

This chapter has outlined the details of the experiment including the rationale for the selection of the measuring instruments, the

procedures to be followed in the collection of data and the plan for the statistical analysis. The subsequent chapter will examine the results of the analysis of data.

CHAPTER III

PRESENTATION AND DISCUSSION OF RESULTS

This chapter deals with the presentation and discussion of the results of the data analysis. It begins with a reiteration of the research problem and hypotheses to be tested. The correlation between the subjects' scores on the ORFT and HFTV is reported. The chapter concludes with a discussion of the results as they apply to the three hypotheses considered in this study.

Reiteration of the Research Problem and Hypotheses

The problem on which the present study was based is : To what extent is an individual's behaviour in a conflict situation related to his or her degree of psychological differentiation.

The three hypotheses to be tested were:

Field-Independent subjects will make a significantly greater number of competitive responses than Field-Dependent subjects.

A match between FI-FI individuals will result in a significantly greater number of competitive responses than a FD-FD match.

A match between FI-FD individuals will result in a significantly greater number of competitive responses.

The Measuring Instruments

The correlation between the portable ORFT scores and HFTV scores was statistically significant ($r=.49$, $z=4.46$). The raw scores used to calculate the correlation coefficient were the figures not completed on the HFTV and the average number of degrees deviation from the vertical

on the ORFT. It was thought that the figures not completed should be used as raw scores as these could be looked upon as deviation from perfect. In this way both instruments were providing scores that could be examined in the same light that is, deviation from what was considered to be perfect.

Although the correlation coefficient was statistically significant the value was not high. As explained by Witkin the scores obtained on both these instruments are used together along with results of the BAT to determine a perceptual index. There is a common element to both these tasks but they do not measure exactly the same factor. As previously discussed in Chapter I HFTV measures figure dependence while the ORFT measures framedependence. The former is a perceptive task while the latter is a proprioceptive task.

The scores obtained from the HFTV were utilized when matching individuals for the Prisoner's Dilemma game. The mean number of figures not completed by the FI group was two while that of the FD group was thirteen. The cut off point for the FI group was four figures imcompleted but one individual was used that had missed five figures. The FD group was composed of individuals who had not completed ten or more figures. Table 1 summarizes this information.

TABLE I

Mean and Standard Deviation for Field-Dependent and Field-Independent Subjects on the HFTV and ORFT.

	FI		FD	
	HFTV	ORFT	HFTV	ORFT
Mean	2.143	2.857	13.095	7.925
S.D.	1.523	1.768	2.069	6.285

The Results of the Statistical Analysis

As stated in Chapter II, the research hypotheses were tested in the null form by means of a T-test for a difference between two independent means. The level of significance was set at ($p < .05$).

TABLE II

Mean Number of Competitive Responses
on Prisoner's Dilemma Game

Group	Mean	S.D.	t
FI	22.3	4.004	4.7948 ($p < .001$)
FD	17.786	4.604	
FI-FI	23.143	4.043	3.998 ($p < .001$)
FD-FD	18.357	3.629	

The results are presented in Table II. Table II shows that there was a significant difference between the mean number of competitive responses made by FI and FD subjects. The T value obtained was significant beyond .001 level ($t(83) = 4.794$, ($p < .001$)). Since the predetermined level for rejecting the null hypothesis was set at ($p < .05$), it was concluded that significant differences between the two groups did exist.

Since the composition of the groups was both male and female a similar test was carried out for both sexes separately. Table III summarizes the information for this part of the analysis.

TABLE III

Mean Number of Competitive Responses
on Prisoner's Dilemma Game (Males and Females)

Group	Mean	df	t
FI MALE	23.04	40	1.274 N.S.
FI FEMALE	21.47		
FD MALE	19.59	40	2.187 ($p < .05$)
FD FEMALE	16.56		
FI MALE	23.04	38	2.195 ($p < .05$)
FD MALE	19.59		
FI FEMALE	21.47	42	4.319 ($p < .001$)
FD FEMALE	16.56		

It was found that significant differences did exist between FI and FD females and FI and FD males. When the mean number of competitive responses of the males and females in the FI group were compared there was no significant difference in the style of their playing. The FI female played as competitively as the FI male.

The FD group was not homogeneous in respect to playing style. The males in this group did play more competitively than the FD females. An explanation for this observation could lie in North American child-rearing practices. Males are socialized into the competitive role more so than females. It would be reasonable to expect that males would play more competitively. Of importance to this study is that the FI males did play more competitively than FD males ($t(38) = 2.195, (p < .05)$). Similarly the mean competitive scores of both female groups was significantly different ($t(42) = 4.319, (p < .001)$).

A chi square was also tabulated for hypothesis one to establish

whether competitive behaviour is related to psychological differentiation. The x^2 value obtained was significant beyond the .001 level ($x^2 = 50.66$, ($p < .001$)). Both the results of the t-tests and the chi square led to the rejection of the null hypothesis lending support for hypothesis one; namely, that field-independent individuals are more competitive than field-dependent individuals.

The former statistics are based on the performance of each individual subject, whereas the following comparisons are based on the matching of individuals.

Hypothesis two predicted that a match between field-independent subjects would result in a significantly greater number of competitive responses than a field-dependent match. Pairs of subjects who were field-independent did make more competitive responses than did pairs who were field-dependent. The t value obtained was significant at the ($p < .001$) level ($t(54) = 3.998$, ($p < .001$)). Therefore, hypothesis two was supported.

Hypothesis three predicted that a match between FI and FD individuals would result in a significantly greater number of competitive responses than cooperative responses being made. Results of this analysis indicated that the difference was significant at the ($p < .05$) level of confidence ($t(54) = 2.097$, ($p < .05$)). Hypothesis three was therefore supported.

As well as comparing the mean number of competitive responses, percentages were also calculated. Field-independents played 63 per cent of the time competitively as compared to the 51 percent obtained by field-dependents.

An examination of the paired situations reveals that when field-independents are matched with field-independents 66 per cent of the moves were competitive whereas a FD-FD match resulted in 52 per cent of the moves being competitive. When field-independents were paired with field-dependents, 53 per cent of all the moves were competitive. Examining this last condition reveals that FI subjects played 59 per cent competitively as compared to the 48 per cent obtained by FD subjects.

Of interest is the percentage of competitive moves resulting from the FI-FI match in comparison to the percentage of competitive moves made by FI subjects when matched with FD individuals. Field-independent subjects tended to play more competitively when matched with another field-independent subject than when matched with a field-dependent subject. An explanation for this difference may be provided by Pilsuk et al., (1965) previously reported in this study. Where gestures of cooperation were not reciprocated increased competition resulted. When a large score could not be obtained field-independent individuals appear to use a strategy that will increase their opponents' losses, even if it means taking a personal loss.

There was little difference in the percentage of competitive or cooperative moves made by the FD group regardless of the situation. These results might possibly indicate that a strategy was not being employed by the FD group but rather the results might indicate randomly responding individuals.

The present study attempted to examine the extent to which competitive behaviour in a conflict situation is related to field-dependence-independence. It was predicted that subjects who scored toward the field-independent end of the FI-FD continuum would tend to be competitive, whereas subjects who scored toward the field-dependent end would tend to be less competitive. It was also predicted that a FI-FI match would result in a greater number of competitive responses than a FD-FD match. The third hypothesis predicted that a FI-FD match would result in a greater number of competitive responses being made.

The research sample consisted of 84 individuals (forty-four females and forty males) over nineteen years of age. They were drawn from a variety of academic and occupational backgrounds such as university students, technicians, high school teachers and individuals involved in an adult retraining program.

The Hidden Figures Test V was used as a measure of field-dependence-independence while the Prisoner's Dilemma game was chosen as the experimental conflict situation.

T-test of significance between independent means was employed as the statistical tool. The level of significance was set at the ($p < .05$) level.

Statistical significance was obtained for each hypothesis presented. The results indicated that there is a relationship between the degree of psychological differentiation of an individual and his behaviour in a two-person game situation in which both cooperation and competition are possible.

Although this research dealt with a specific conflict situation there

is merit in examining the possible implications of the results. An important finding was that field-independent individuals were competitive and field-dependent individuals were less competitive. Field-dependent individuals did not play cooperatively as might be expected. The basis for this could lie in North American child-rearing practices, educational policies and methodologies which stress competition.

If this assumption is correct then there would be implications for education. It would seem that a curriculum to develop cooperative skills would be necessary. But before this could be developed there would need to be a more thorough understanding of how field-independent and field-dependent individuals learn.

A study of cognitive style leads to an emphasis on individuality but perhaps does not imply that students should be taught individually. This would not necessarily lead to the development of cooperative skills. It would appear that a reorganization of classroom structure would be required. Classroom grouping could be based on cognitive style which might help to eliminate the inherent competitive structure of existing high, medium and low groups.

It would seem that teachers would also need to be aware of their own teaching style which is determined by their cognitive style. They would need to be prepared to adapt their favoured style of teaching to the learning styles of the students.

There also would be implications for higher education. Generally, to be successful at medical school it would appear that an individual needs to be both highly analytical and competitive. Yet, it would seem that a doctor with both analytical competence and a cooperative social orientation would be more effective.

Since cognitive style extends into personality it may have an effect on leadership style. Future studies in this area could examine superordinate-subordinate relationships in conflict situations in the field of educational administration..

There are many factors which contribute to how an individual will act or react in conflict situations. Aspects of personality as well as situational determinants should be considered together. The present study provided evidence for the relationship between psychological differentiation and behaviour in a two-person conflict situation.

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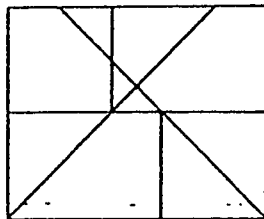
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INSTRUCTIONS TO SUBJECTS

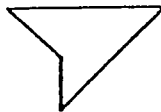
HIDDEN FIGURES TEST—V

Each problem in this test is made up of two designs, a complicated figure on the first page and a simple figure on the next. In each problem the simple design is contained in the complicated design. You are to find where the simple design is contained in the larger design and sketch it in over the lines of the figure.

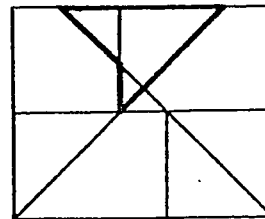
Here is an example of a complicated figure, a simple figure, and the complicated figure shown again with the simple figure sketched in.



Complicated figure



Simple figure



Simple figure sketched in

The smaller figure is always present in the larger figure and always in the upright position. Be sure the figure you find is exactly the same as the simple figure, both in size and proportions. Work carefully and as systematically as you can. If you feel that you cannot solve one of the figures, you may skip it and come back to it later if you have time, but you will waste time if you keep skipping from figure to figure. Do not worry about erasing completely if you have one or two incorrect lines, but be sure that you have all the correct ones clearly indicated.

The subjects were allowed ten minutes to complete the test.

PROCEDURE FOR PORTABLE RFT - ADULTS

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Note: Apparatus must be on a sturdy table and be level.

Before seating S in front of apparatus:

"In this test we want to find out how well you can determine the upright - the vertical - under various conditions."

"In this box (PRFT) you will see a square frame and within the frame you will see a rod."

"It is possible for me to tilt the frame to the left or the right. I can also tilt the rod to the left or the right. I can tilt the frame alone or the rod alone; or I can tilt them both at the same time, either to the same side or to opposite sides."

"When I lower the curtain at the beginning of each trial, I want you to tell me whether the rod and frame are straight up and down - i.e. vertical - or whether they are tilted. In other words, tell me whether they are tilted."

"Are there any questions?"

Seat S in front of apparatus and adjust headrest. S's hands must be in his lap, not touching table. Tell S to keep his head in the rest at all times. Feet together.

Trial 1: Adjust the frame to 28L and the rod to 28L. Lower curtain. Say to S: "What is the position of the rod and the frame?" (Record S's response).

If S says the rod is not vertical, say to him:

"I will now turn the rod slowly until you think it is straight with the walls of this room. As I said, I will turn it slowly, and after each turn, tell me whether it has been turned enough or whether you want it turned some more. Just say 'more' or 'enough' after each turn. Please make your decisions quickly and don't be too finicky. Which way shall I move the rod to make it vertical - clockwise or counterclockwise?"

Now move the rod about 3' at a time opposite to the direction in which S says it is tilted, until he reports "enough". Ask the S after he

reports the rod is vertical: "Is the rod now vertical - that is, is it straight with the walls of this room? In other words, is it straight up the way the flagpole outside is?"

If the subject should now say that he wants the rod moved some more in either direction, do so. Raise the curtain and record the position of the rod.

If on the first trial, the S reports the rod to be straight at the outset, ask him the question: "Is the rod now vertical, that is, is it straight with the walls of this room?"

In such instances, give the S the instructions concerning the straightening of the rod, as above, on the next trial. If on the next trial, the S again states that the rod is straight at the outset, give him these instructions, on the first trial on which he says the rod is tilted.

Trial 2: Leave the frame at 28L and adjust the rod to 28R. Lower the curtain and say to the S:

"Would you tell me now and at the beginning of all subsequent trials whether the rod and frame are straight with the walls of this room, or tilted; and if the rod is tilted, whether the rod should be moved clockwise or counter-clockwise to be made straight?"

If the S asks you to turn the rod, do so until he says "enough".

Ask him again: "Is the rod now vertical - that is, is it straight with the walls of this room?"

Do not ask this question of subsequent trials. Raise curtain. Record adjustment. Proceed to next trials.

Trial 3: Frame 28R Rod 28R

Trial 4: Frame 28R Rod 28L

Trial 5: Frame 28L Rod 28L

Trial 6: Frame 28L Rod 28R

Trial 7: Frame 28R Rod 28R

Trial 8: Frame 28R Rod 28L

Before S enters the room, be sure frame is straight and curtain up.

If at any time after the rod has been adjusted on a given trial the S should say that he wants it moved some more in either direction, do so.

If the S should take more than 5 seconds on any trial before saying "more" or "enough", tell him: "Please make your decisions quickly".

If the S should repeatedly say "more" or "enough" before the turn of the rod is completed, say to him: "Please wait until I have completed the turn".

Check from time to time to determine whether the S's head is in the proper position in the headrest. Attaching the elastic cord around the back of S's head is recommended.

INSTRUCTIONS GIVEN TO SUBJECTS PLAYING

PRISONER'S DILEMMA

You will be playing a game which has certain payoffs. You cannot by yourself control the specific payoff for a given game. Rather, the outcome will depend on what your partner does, as well as on what you do. Each of you has a payoff sheet in front of you.

The game is played as follows: You are players 1 and 2 respectively. In front of you, on the payoff sheet, are two choice circles labeled A and B. On any given trial each of you may play, i.e., by pointing to the A or B circle. Any decision is final, i.e., you cannot change your mind once you have made your choice. The payoffs resulting from such a move are indicated on your payoff sheets. Player 1 is assigned the scores on the lower half of each cell while player 2 is assigned the scores on the upper half. If both players choose A they will both receive 5 points. If player 1 chooses B while player 2 chooses A, player 1 gains 10 points while player 2 loses 10 points. If both players choose B, each loses 5 points. If player 1 chooses A while player 2 chooses B, player 1 loses 10 points and player 2 gains 10 points.

The experimenter will indicate after each move the number of points gained and lost by each person. This will be recorded on the individual score sheets in front of you.

The gains or losses accumulated by each of you by the end of the game will be hypothetically converted into money.

It is of the essence that you do not communicate with each other in any form whatsoever. This includes sighing, laughing, or any other form of communication which might indicate how you feel about given outcomes, or how you would like your partner to behave. The reason for this condition of no communication is that the experiment becomes invalid if any such communication takes place.

Please do not talk about this experiment to others. They might participate in later experiments and may, as a result, be influenced to play differently.

COMPETITIVE RESPONSES PRISONER'S DILEMMA

<u>FI-FI</u>		<u>FD-FD</u>		<u>FI-FD</u>	
S	Score	S	Score	S	Score
1	24	29	24	FI 57	21
2	22	30	19	58	29
3	22	31	15	59	17
4	28	32	11	60	26
5	18	33	25	61	21
6	19	34	17	62	19
7	22	35	18	63	19
8	19	36	19	64	24
9	29	37	14	65	18
10	21	38	19	66	21
11	28	39	13	67	19
12	17	40	20	68	20
13	26	41	17	69	16
14	25	42	15	70	20
15	20	43	15	FD 71	17
16	25	44	20	72	14
17	24	45	17	73	20
18	24	46	19	74	11
19	31	47	17	75	21
20	21	48	14	76	15
21	27	49	14	77	14
22	27	50	23	78	14
23	29	51	19	79	17
24	22	52	20	80	10
25	18	53	25	81	16
26	18	54	17	82	20
27	25	55	13	83	23
28	17	56	35	84	21

ABSTRACT OF

Field-Dependence-Independence and Competitive Behaviour
Behaviour in the Prisoner's Dilemma Game Situation

The present study investigated the relationship between competitive behaviour in a conflict situation and field-dependence-independence. It was hypothesized that individuals who scored toward the field-independent end of the FI-FD continuum would tend to be competitive whereas individuals who scored toward the field-dependent end would tend to be less competitive. The matching of individuals according to cognitive style was also considered. It was predicted that a FI-FI match would result in a greater number of competitive responses than a FD-FD match. The third hypothesis predicted that a FI-FD match would result in more competitive than cooperative responses being made.

The research sample included individuals over nineteen years of age drawn from a variety of academic and occupational backgrounds. Eighty-four individuals participated (forty-four females and forty males). They were classified as either field-dependent or field-independent based on the Hidden Figures Test V and assigned to one of the three matched conditions. They then played the Prisoner's Dilemma game; the experimental conflict situation.

T-tests were calculated comparing the mean number of competitive responses. The level of significance was set at ($p < .05$).

Statistical significance was obtained for each hypothesis. These results indicated that there is a relationship between the degree of psychological differentiation of an individual and his behaviour in a two-person conflict situation.