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Distributive justice research from an interactionist per-  
spective III: When and why do attitudes interact syner-  
getically with functionally equivalent situation factors?

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## ABSTRACT

Synergetic interactions are considered a special case of person-situation interactions and are defined as interactions between functionally equivalent person and situation factors that amplify each other. Synergetic interactions are core elements of several psychological constructs, models, and theories such as Spielberger's trait-state theory or the general diathesis-stress model. The present paper considers synergetic interactions in justice related behavior. Studies testing synergetic effects that follow from justice motive theory and the belief in a just world construct are reviewed briefly. A series of experiments is described in detail in which the synergetic assumption was tested for attitudes toward principles of distributive justice and allocation behavior. The findings from these studies are inconsistent with an interaction found in some experiments but not in others. It is suggested that normative constraints uniformed behavior in some conditions in a way that counteracted the synergetic effect and neutralized it. This conjecture was tested. Several strategies were employed for loosening situation strength due to normative constraints. Two strategies were successful: (1) reducing subjects' responsibility for the final outcome of their decision by having them allocate chances to win rewards instead and having them allocate rewards directly and (2) assigning subjects the role of a neutral judge instead of the role of corecipient. As a consequence of loosening normative constraints, synergetic interactions between attitudes and functionally equivalent situation factors were found. General implications of these findings for interactionist research are discussed. It is suggested that varying differences in situation strength may account for some of the inconsistent findings in interactionist research.

## ZUSAMMENFASSUNG

Die Annahme synergetischer Effekte im Sinne sich wechselseitig verstärkender funktional äquivalenter Person- und Situationsfaktoren ist zentraler Bestandteil verschiedener Konstrukte, Modelle und Theorien, beispielsweise der Trait-State-Theorie von Spielberger oder des allgemeinen Diathese-Streß-Modells. In der Arbeit werden synergetische Person-Situation-Interaktionen im Gerechtigkeitsverhalten behandelt. Zunächst wird ein kurzer Überblick über die Forschung zu synergetischen Interaktionen gegeben, die sich aus der Gerechtigkeitsmotivtheorie und dem Konstrukt des Glaubens an eine gerechte Welt ableiten lassen. Dann wird eine Serie von Experimenten beschrieben, in denen die Annahme synergetischer Interaktionseffekte zwischen Einstellungen zu Prinzipien der Verteilungsgerechtigkeit und funktional äquivalenten Situationsfaktoren auf das Aufteilungsverhalten geprüft wird. Die Ergebnisse waren inkonsistent. Unter manchen Bedingungen wurde ein Synergieeffekt gefunden, unter anderen nicht. Das Ausbleiben von Synergieeffekten wird damit erklärt, daß soziale Normen in einigen experimentellen Bedingungen das Aufteilungsverhalten uniformieren und unterschiedliche Situationsstärken den Synergieeffekt neutralisieren. Diese Hypothese wurde untersucht, indem die normativen Restriktionen der starken Situationen experimentell zu reduzieren versucht wurden. Zwei Strategien erwiesen sich als erfolgreich: (1) die Vp verteilt statt Geld Wahrscheinlichkeiten, Geld zu gewinnen, (2) die Vp befindet sich in der Rolle eines neutralen Richters statt in der Rolle eines Korezipienten. Unter diesen Bedingungen wurde die synergetische Interaktion gefunden. Die Implikationen der Befunde für interaktionistische Forschung werden erörtert. Es wird vermutet, daß das inkonsistente Befundmuster in interaktionistischen Forschungsprogrammen unter anderem auch auf variable Unterschiede in den Situationsstärken zurückgeht.

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### THREE DISCIPLINES OF SCIENTIFIC PSYCHOLOGY

In his famous presidential address to the 65th Annual Convention of the APA, Cronbach (1957) described psychology as a science of two disciplines: general psychology and differential psychology. Both pursue the same scientific goals, i.e., the prediction and explanation of human behavior, but they rely on different research strategies and concentrate on different factors of human behavior. General psychology employs experimental methods to identify exogenous (situation) factors of psychological processes, while differential psychology extracts latent traits as endogenous (person) factors from the correlational structure of manifest indicators such as overt behavior, personality ratings, questionnaire items, etc.

Whether attributes of the situation or traits of the person are more important factors of behavior has been a matter of considerable controversy: the longstanding person-situation debate. As early as in 1928, Hartshorne and May challenged the notion that honesty is a character trait by showing empirically that individual differences in moral behavior are rather inconsistent across different types of situations and different kinds of conduct. Forty years later, Mischel (1968) reiterated this challenge by concluding from a review of empirical research that, with the possible exception of intelligence, measures for personality traits barely predict more than 10% of the individual difference variance in behavior. A similar claim was raised by Wicker (1969) for attitudes measures and by Deutscher (1966) for the correlation between objective measures of behavior and corresponding self-reports.

In reaction to this criticism, many conceptual, theoretical, and methodological counterarguments were advanced and numerous data sets were presented in defense of the trait model (Kenrick & Funder, 1988; Schmitt & Borkenau, 1992). One of the main counterarguments, articulated predominantly by Epstein (e.g., 1980), was that the concept of traits refers by definition to broad classes of behavior and that a single behavior in a specific situation can hardly represent such a class. Therefore, an appropriate test of the trait model requires aggregated criteria that cover the entire range of manifestations and that correspond as closely as possible to the conceptual range of the trait construct at issue.

In retrospect, the person-situation debate was fruitful in several regards (Kenrick & Funder, 1988; Schmitt, 1990). Protagonists of competing paradigms were forced to spell out their presumptions more precisely -- which helped to correct misconceptions (Conley, 1984; Herrmann, 1980). Methodological pitfalls were identified (Alwin, 1973; Golding, 1975; Olweus, 1976), and solutions for some of them were offered (Paunonen, 1984; Steyer & Schmitt, 1990). Existing data sets were reanalysed, demonstrating that results and substantive conclusions depend greatly on the chosen method of analysis (Epstein & O'Brien, 1985). Finally, and most importantly in the context of the present treatise, interactionism was born as a third paradigm to supplement and integrate the general and the differential perspectives (Ekehammar, 1974; Endler, 1976; 1982; Magnusson & Endler, 1977).

In his description and critique of the schism between general and differential psychology, Cronbach (1957) had anticipated interactionism and prepared it conceptually: "A united discipline [of psychology; added by MJS] will study both of these [situations and individuals as sources of variation; added by MJS], but it will also be concerned with the otherwise neglected interactions between organismic and treatment variables." (p. 681). Based primarily on theoretical reasoning, he predicted that such interactions would explain large proportions of variance over and above those explained already by differences between individuals and differences between situations. Cronbach's prediction was later confirmed in empirical research. The authors of many research studies and several review

articles concluded that the interaction between person and situation factors oftentimes explained more variance in behavior than both main effects alone or even together (Bowers, 1973; Cronbach, 1975; Cronbach & Snow, 1977; Endler & Hunt, 1966; Moos, 1969; Sarason, Smith, & Diener, 1975; Schmitt, 1990).

The basic idea of interactionism is that situation and person factors do not influence human actions independently, but rather intertwine in systematic and lawful ways. One of the several types of interactions that have been considered by Magnusson and Endler (1977) and by other writers is what may be called synergetic interaction. According to this notion, functionally equivalent situation and person factors amplify each other. As a matter of fact, synergetic person-situation interactions have been considered in various substantive fields and they are constituent elements of several theoretical concepts and models such as Cattell's (1971) liability concept, Spielberger's (1972) proneness concept, the vulnerability concept of the general diathesis-stress model (Alloy, 1988; Davison & Neale, 1990), as well as the reactivity concept in psychophysiology (Manuck, Kasprovicz, Monroe, Larkin, & Kaplan, 1989), temperament (Kagan, Snidman, Arcus, & Reznick, 1994), and stress (Turner, Sherwood, & Light, 1992). Spielberger's (1972) proneness concept may serve as an example for illustrating what is meant by a synergetic interaction. Spielberger assumes that trait anxiety moderates the effect of threatening stimuli on state anxiety. Compared to individuals with low trait anxiety, high trait anxiety individuals show a greater increase in state anxiety in a threatening situation compared to a neutral situation. In other words, high trait anxiety persons react more sensitively than low trait anxiety persons to differences in the amount of threat between situations.

At least three related psychological mechanisms can be considered as accounting for synergetic person-situation interactions. (1) First, individuals with high trait scores may be more sensitive in perceiving functionally equivalent situational cues. Adopting a basic concept from psychophysics and perception (Gordon, 1989), the threshold for differences between stimuli may covary with the equivalent trait dimension. (2) Second, individuals may tend to classify situations according to their personality. Adopting the availability concept from cognitive psychology (Evans, 1989; Kruglanski, 1989), attitudes, values, and personality traits may correlate with the availability of corresponding situational cues that are used to encode the situation. (3) Third, attitudes, values, and personality traits may lead individuals to weigh the components of a situation differentially. Adopting the value concept from the general expectancy value model in decision making and action theories (Feather, 1982), the centrality concept from self theories (Thomas, 1989), or the ego-involvement concept from attitude theory (Sherif & Cantril, 1947), the weight put on specific aspects of the situation may be a function of the person's attitudes, values, and personality.

### **SYNERGETIC INTERACTIONS IN JUSTICE MOTIVE RESEARCH**

The interactionist research paradigm has been used to investigate behavioral consequences of the justice motive. The basic assumption of justice motive theory states that individuals have a desire for justice and a need to believe in a just world, a world in which people get what they deserve and deserve what they get (Lerner, 1977). If individuals observe undeserved suffering of innocent victims, they are motivated to help them or to punish the perpetrator. If these means to reestablish justice are not possible or too costly, individuals must choose other ways to defend their belief in a just world. One possibility is distorting the situation cognitively such that it appears just after all. Distortions can take on various forms, some of which seem to be paradoxical on first sight such as denying innocent suffering, blaming victims for their fate, or derogating them. These consequences of the justice motive

have been demonstrated empirically in several experiments (Lerner, 1970; Lerner, Miller, & Holmes, 1976).

Rubin and Peplau (1973) suggested that individuals differ in their need for justice. They developed a self-report questionnaire for measuring belief in a just world (BJW). If BJW as measured by the Rubin and Peplau scale or similar scales is indeed an indicator of the justice motive, individuals who differ in BJW should also differ in their reactions to innocent suffering. From a synergetic interactionist point of view, the need for justice should amplify situational threats to the person's belief in a just world. Therefore, subjects with a high need for justice should help the victim, punish the perpetrator, deny innocent suffering, blame the victim, or derogate the victim more than subjects with a low need for justice (BJW). Some of these predictions could be confirmed in several studies that implemented an interactions design.

An initial study was conducted by Rubin and Peplau (1973) themselves. In this study, groups of 19-year-old men listened to the 1971 national draft lottery by which they and their age peers were assigned the likelihood of being drafted as soldiers with the possible consequence of being sent to Vietnam. Most subjects reacted with greater sympathy, greater liking, and less resentment toward individuals with high draft priorities. Among subjects with high BJW scores (upper third of the distribution), however, the compassionate pattern was neutralized and even reversed regarding four out of seven measures for liking with fortunate targets being rated slightly more favorably than unfortunate targets.

Adopting the Lerner and Simmons (1966) paradigm, Zuckerman, Gerbasi, Kravitz, and Wheeler (1975) showed subjects a videotape of a person who appeared receiving electric shocks in a supposed learning experiment. Subjects with high BJW derogated the victim more than subjects with low BJW.

Miller (1977) gave subjects the opportunity to donate some of their pay for participating in his experiments to needy families. Threat to BJW was varied in the first experiment by describing the family either as an isolated case of neediness or as an example for many similar cases. It was expected that more help would be given to a single victim because only in this case does help seem effective for restoring justice. In the second experiment, need was displayed either as temporary or as permanent. It was expected that more help would be given to temporarily needy families than to families with enduring needs because donating money cannot relieve permanent suffering. More importantly for our present discussion, it was predicted that BJW would moderate these effects. In comparison with low believers, high believers were expected to donate more money in the Isolated and Temporary Conditions and less money in the Group and Permanent Conditions. Both interaction effects were confirmed.

Subjects in an experiment by Dion and Dion (1987) were shown pictures of attractive and unattractive stimulus persons. Subjects were asked to rate the targets on 17 personality trait dimensions (social desirability index) and nine life objectives (life-outcome index). A significant interaction effect of BJW x attractiveness on the dependent variables was expected. For male targets, BJW moderated the effect of attractiveness in the expected manner: While believers in a just world attributed a more favorable personality to attractive than to unattractive targets, nonbelievers displayed no such difference.

Another implication of the justice motive was used by Zuckerman (1975) to test the synergetic hypothesis. According to the BJW construct, individuals link their own as well as other people's behavior to certain outcomes. In a most general sense, good deeds are rewarded and bad deeds are

punished if the world is just. Zuckerman argues that individuals with a strong BJW may try to gain desired outcomes by committing socially desired acts such as helping people in need. In line with this reasoning, subjects with a high BJW volunteered for more experiments two days before an exam than did subjects with a low BJW. Five weeks before the exam, no such difference between subjects with high and low BJW was found, presumably because at this time, the desired outcome of a good grade was much less salient than shortly before the exam.

Several other studies on the justice motive were designed according to the interactionist paradigm. Not all results of these studies were in line with the synergetic hypothesis. In fact, not all results of the studies that were mentioned above agree completely with the synergetic model. However, since the primary purpose of this paper is to present and discuss unpublished interactionist research in the domain of distributive justice, these "negative" results shall not be described and discussed in detail here. This has been done elsewhere (Schmitt, in press). The remainder of this article is devoted to interactionist research on distributive justice and allocation behavior. The studies that will be reported have either not yet been published or were published in German journals that are usually not read by international fellows.

### **SYNERGETIC INTERACTIONS IN DISTRIBUTIVE JUSTICE AND ALLOCATION BEHAVIOR**

As for most if not all areas of social psychology, Cronbach's (1957) portrayal of the two scientific paradigms is a valid description of theorizing and research in distributive justice and allocation behavior. Beginning with equity theory (Adams, 1965; Walster, Berscheid & Walster, 1973), most studies on allocation behavior and distributive justice have been experiments. It has been investigated, for example, whether the choice of a particular allocation principle depends on the kind of resource to be distributed (e.g., material vs. symbolic), the social context of the distribution (e.g., competitive, cooperative, alimentary), the social relation between the recipients (e.g., difference in status and power), the existence and visibility of achievement differences between the recipients, the existence and visibility of need differences between the recipients, the attribution of achievement differences (e.g., effort vs. ability), and the attribution of need differences (e.g., self-inflicted vs. not self-inflicted). Comprehensive reviews of this experimental research have been provided by Berkowitz and Walster (1973), Mikula (1981), Messick and Cook (1983), Deutsch (1985), and Törnblom (1992).

In some of these experiments, demographic variables (age, social class, gender, nationality) and genuine personality variables (need for approval, protestant ethic, social orientation, value orientation, achievement motivation) were included as covariates and found to correlate with allocation behavior and justice judgments. Reviews of this research have been provided by Adams and Freedman (1976), Gergen, Morse, and Gergen (1980), and Major and Deaux (1982). Given these more or less incidental findings and the large proportions of variance that remained unexplained in experimental studies, some scholars and research groups became interested in individual differences in allocation behavior and related justice judgments. Acknowledging the possibility that the equity criterion may be less universally accepted than originally postulated, Huseman, Hatfield, and Miles (1985) proposed the construct of Equity Sensitivity and presented a questionnaire for identifying benevolent individuals (input exceeds outcome), entitleds (outcome exceeds input), and equity sensitives (input is proportional to outcome).

Other researchers have tried to measure attitudes toward the "big three" distribution principles. Herrmann and Winterhoff (1980) developed two Rasch scales for measuring attitudes toward equity

and toward parity in adolescents. Schwinger and Winterhoff-Spurk (1984) adopted these scales for measuring equity and parity attitudes in adults. Montada, Schmitt, and Dalbert (1983) as well as Sabbagh, Dar, and Resh (1994) developed scales for measuring attitudes toward equity, equality, and need as distribution principles. A typical equity item is: Those who have a better education should earn more money (Herrmann & Winterhoff, 1980). A typical parity or equality item is: The distribution of money and income should be as equal as possible (Sabbagh et al., 1994). A typical need item is: I find it just if friends distribute their common earnings such that the one who needs more for his family gets more (Montada et al., 1983).

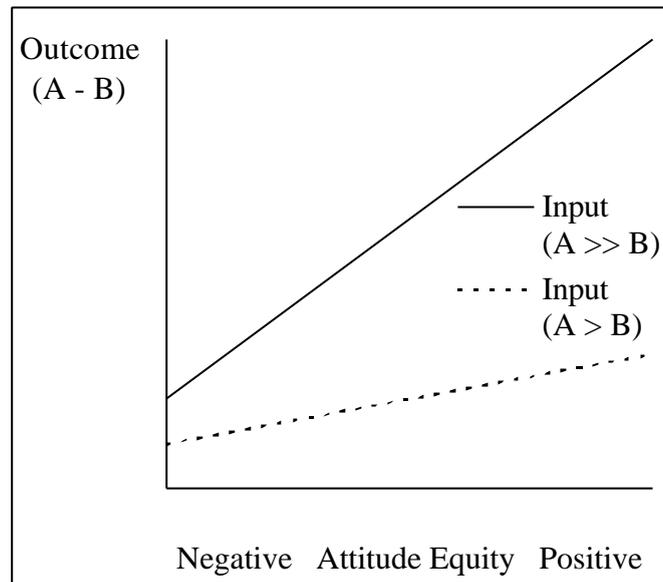
A different format for measuring attitudes was chosen by Bossong (1983). In his questionnaire, ten scenarios are presented describing unequal contributions of two individuals toward a common achievement. Subjects are asked to choose one out of five possible distributions for the common monetary reward. These five distributions differ systematically in how closely they correspond to an equitable versus an equal distribution. By using this design, equity and equality are confounded and represent opposite poles of a single dimension.

Still another method for measuring individuals' preferred distribution principle was proposed by Jasso (1983). The Just Reward Matrix specified in her general model contains the rewards that a group of judges (rows) considers to be just for a group of rewardees (columns). From this matrix, various Just Reward Distributions can be derived. The column vectors represent the allocations that the observers consider just for each of the rewardees. The row vectors reflect the distribution across the rewardees that each observer considers to be just. The marginal row distribution represents the mean just rewards for the rewardees, averaged across all observers. The marginal column distribution contains the mean reward that the observers consider appropriate, averaged across the rewardees. Finally, in the case where observers and rewardees are identical, the main diagonal of the Just Reward Matrix contains the rewards that each observer considers just for herself.

Little is known about how well these attitude measures predict overt allocation behavior or justice judgments regarding real allocations. In most studies, the scales were correlated with other self-report measures (e.g., Montada, Schmitt, & Dalbert, 1986; Schwinger & Winterhoff-Spurk, 1984), with behavioral intentions (e.g., Montada & Schneider, 1989), or with suggested allocations in hypothetical situations (e.g., Bossong, 1983; Schmitt, Barbacsy, & Wunsch, in press). Further and more importantly in the present context, only a few studies had been conducted until recently in which the interplay between attitudes and functionally equivalent situation factors was investigated. Before these studies and a series of six recent studies conducted by this author and his students are described, it may be useful to consider what predictions follow from the interactionist model.

Lets consider the equity principle first. According to the synergetic hypothesis, subjects with a positive attitude toward the equity principle should be more sensitive than subjects with a negative attitude to situational information, such as differences in input (investments, achievements), which suggest an equitable distribution between recipients. The variation of input is not expected to have (only) a general effect on the distribution of outcome or corresponding justice judgments. Rather, the situational variation of input should make a larger difference for subjects with a favorable attitude than for subjects with an unfavorable attitude. In other words, a positive attitude toward the equity principle amplifies the effect of a situational input difference. This pattern is displayed schematically in Figure 1 for two recipients A and B who differ little (>) or much (>>) in input. Since factors which interact statistically are formally equivalent, the same interaction can also be phrased in terms of differential effects of the person factor. More specifically, the effect of attitude toward equity should increase with the magnitude or salience of input differences in a particular situation. The size of the

synergetic interaction effect may depend on additional situation factors or person variables. It can be expected, for instance, that the size of the interaction will depend on the extent to which achievement differences can be attributed to effort versus ability (Lamm & Kayser, 1978).



*Figure 1*

Schematic Synergetic Interaction Between Situational Differences in Input and Attitude Toward Equity on Outcome

An analogous interaction effect is expected from a synergetic model for the interplay between attitude toward the need principle and situational informations on need differences between the recipients. Subjects with a positive attitude toward the need principle should be more sensitive to or put more weight on differences in needs between recipients. Again, the size of this synergetic effect may depend on third variables such as, for instance, the extent to which the person in need can be made responsible for his or her situation (Lamm & Schwinger, 1980).

Finally, the opposite interaction effect is expected for attitude toward the equality principle and any kind of situational information which justifies an unequal distribution according to other distribution principles. For example, subjects with a positive attitude toward equality should tend to disregard or put less weight on differences between recipients in needs, achievements, and those causes of need and achievement differences that are generally accepted as legitimate reasons for unequal distributions (see above). Again, the size of the interaction effect may depend on additional variables such as the social context of the transaction (Deutsch, 1975, 1985) or the relation among the recipients (Lerner, 1977). Strictly speaking, the moderating effect of attitude toward equality is not synergetic because a positive attitude deamplifies the effect of unequal input or need. This is, however, only a matter of coding. The effect is synergetic if we consider attitude toward inequality as opposed to attitude toward equality.

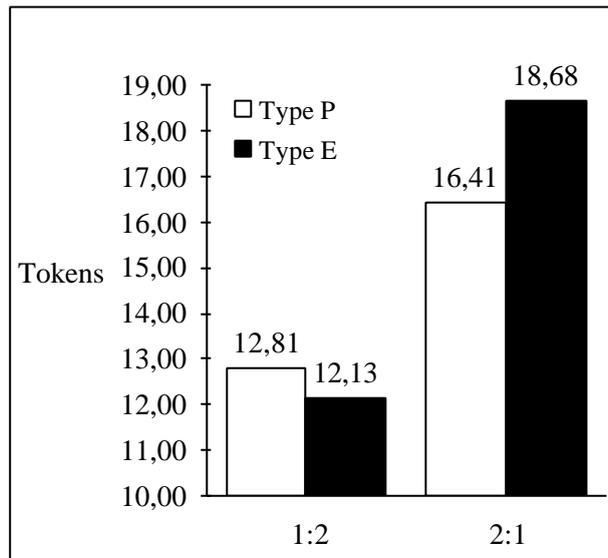
### **Herrmann and Winterhoff's (1980) Research**

A first, model setting study on the joint effect of attitudes and situation factors on allocation behavior was conducted by Herrmann and Winterhoff (1980). These authors measured junior high school students' attitudes toward equity and parity with two Rasch scales. They defined equity-type indi-

viduals (Type E) as having scores above the median in the equity scale and parity scores below the median. Parity-type individuals (Type P) had the opposite pattern of attitudes (high parity and low equity scores).

In a first experiment, 44 E-type and 44 P-type subjects were selected from a larger sample of 256 junior high school students whose mean age was 12 years. Subject were asked to compete with an anonymous partner in a computer game. Subjects were given bogus feedback on their relative achievement. In one condition, they were told that they had performed about twice as fast as their opponent. In the second condition, they were told that they had been only half as fast as the other person. A second experimental factor was Commitment. In one condition, subjects were informed about their values on the attitude measures, in the second condition they were not. Subjects were asked to distribute 30 tokens among themselves and their opponent. Tokens could later be exchanged for prizes such as pens, toys, books, etc. The number of tokens subjects awarded themselves served as the dependent variable.

A two (Type) by two (Relative Achievement) by two (Commitment) analysis of variance revealed a significant main effect for Relative Achievement, explaining 49% of the variance of the dependent variable, and a significant interaction between Type and Relative Achievement that explained 4% of the variance. The means for these effects are given in Figure 2.



**Figure 2**

Mean Amount of Tokens Kept by E-Type and P-Type Subjects under Conditions of Low (1:2) vs. High (2:1) Relative Achievement (Figure Generated from the Results Reported by Herrmann & Winderhoff-Spurk, 1980)

Virtually the same pattern of results was obtained in a second experiment that was also conducted with junior high school students as subjects. The second experiment differed from the first only with regard to the Commitment Factor. In one condition, subjects were informed correctly about their attitude typicality, while in the other condition they were given wrong information about their attitudes. This manipulation had again no significant effect on the dependent variable. The important result of both experiments is that they support the synergetic hypothesis outlined above.



## **Experiment 1: Extending Herrmann and Winterhoff's Design<sup>1</sup>**

In a first study, Herrmann and Winterhoff's (1980) research was replicated and extended in three regards. First, need was considered in addition to equity and equality as a distribution principle. Second, individual attitudes toward all three principles were treated as continuous variables, not confounded, and measured with several questionnaires. Third, situational counterparts of attitudes toward all three principles were varied experimentally. As in Herrmann and Winterhoff's (1980) studies, relative achievement was varied as a situation factor which is functionally equivalent to a preference for equity. In one condition, subjects were told that they had performed twice as good as their partner. In the other condition, they were told that they had done only half as good as their partner. Divergent from Herrmann and Winterhoff's (1980) procedure, money was used as a reward in this study to increase experimental realism according to Greenberg (1978).

Deutsch (1975) and Lerner (1977) have suggested that the equality principle is generally preferred in cooperative social relations. Results from several studies support this assumption (Deutsch, 1985; Schwinger, 1980). While cooperative social relations are usually characterized by common goals, mutually exclusive goals are typical for competitive contexts of which the best example may be sports. Consequently, Deutsch (1975), Lerner (1977), and others have predicted that equity would be considered most appropriate in competitive social contexts. Although the empirical evidence is not entirely consistent (Schmitt, 1994), some studies have confirmed this prediction. Following Deutsch's and Lerner's lines of reasoning, the social context was varied as a second factor. Under one condition, subjects performed together with a partner (cooperative context), while under the other condition they were instructed to compete against an opponent (competitive context).

Past research has shown that needs are taken into account when they are obvious (Lamm & Schwinger, 1980; Leventhal & Whiteside, 1973). To test whether attitudes toward need amplify situational differences in need, the need of the partner/opponent was varied as a third factor. Using the waiting room method, the subjects's partner/opponent mentioned strong financial needs in one condition, while in the second condition no financial needs were mentioned.

### *Hypotheses*

#### Effects of Experimental Factors

Main effects were expected for Relative Achievement and Need. Losers and subjects with needy partners/opponents were expected to keep less money than winners and subjects whose partner/opponent had not mentioned financial needs. Both factors were expected to interact with Social Context. Based on the reasoning outlined above, the effect of Relative Achievement was expected to be smaller in the Team Condition than in the Competition Condition, while the effect of Need was to be larger in the Team Condition than in the Competition Condition.

#### Person-situation interaction Effects

Based on the reasoning presented earlier, the following synergetic interactions between attitudes and functionally equivalent situation factors were expected.

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<sup>1</sup> The following students participated in conducting this experiment in partial fulfillment of course requirements: Simone Binz, Susanne Kraft, Natascha Kuhlmann, Tanja Lischetzke, Kerstin Nisslmüller. The study was funded by Trier University.

Relative Achievement x Attitude Toward Equity. The effect of relative achievement was expected to be stronger for subjects with a favorable attitude toward equity than for subjects with a negative attitude.

Need x Attitude Toward Need. The effect of need was expected to be stronger for subjects with a favorable attitude toward need than for subjects with a negative attitude.

Relative Achievement x Attitude Toward Equality. The effect of relative achievement was expected to be weaker for subjects with a favorable attitude toward equality than for subjects with a negative attitude.

Need x Attitude Toward Equality. The effect of need was expected to be weaker for subjects with a favorable attitude toward equality than for subjects with a negative attitude.

## *Method*

### Attitude Scales

Attitudes toward equity, equality, and need were measured with a justice inventory that consists of 76 items developed by Montada et al. (1983), Bossong (1983), Schwinger and Winterhoff-Spurk (1984), and Sabbagh et al. (1994). A detailed description of the inventory and its psychometric properties can be obtained on request (Schmitt et al., 1994).

### Design, Subjects, and Cover Story

Three experimental factors were fully crossed and varied between subjects: Relative Achievement (2:1, 1:2) x Social Context (Partner, Opponent) x Need of Partner/Opponent (Yes, No). A total of 128 students from Trier University (no advanced psychology students) were recruited individually and assigned randomly to the experimental conditions. Gender of subject was balanced in all experimental conditions.

While being recruited, subjects were told that the purpose of the study was to find out whether individuals can accomplish difficult computer work requiring full concentration better if they work together with a coworker in the same room or if they work in separate rooms. This information would be important to know for designing offices and for shaping the work ecology of employees who do computer work. This time, the Separate Rooms Condition would be realized. Subjects were said that in order to simulate the conditions in the real world as realistically as possible, they would be paid according to their achievements.

### Experimental Procedure and Dependent Variable

Each subject was led to a room in which the partner/opponent was already waiting. This person was a female confederate who started an informal conversation. During the conversation, she either mentioned or did not mention financial needs. In the Need Condition, she said that the primary reason for participating in the experiment was to make a little money. In the No Need Condition, she said that she did not care much about the money that could be earned but was curious about the task.

After a while, the experimenter came in and explained the computer (jigsaw) puzzle. In the Team Condition of the Social Context Factor, the subject and the confederate were told to feel like a team that cooperates to maximize a common achievement. The task at hand was an imitation of computer work in the real world because nowadays, computer projects are more often worked on by small teams than by individuals. In the Competition Condition, the subject and the confederate were told to

feel like competitors who try to be better than the other. This would be an imitation of high pressure computer jobs in the real world. The subject was then led to another room and the puzzle was started. When the subject finished, the experimenter announced the length of the time the subject had needed and then left the room, presumably to find out the time required by the other subject. Depending on the condition of the Relative Achievement Factor, she came back in immediately (Losing Condition) or after a short period of time (Winning Condition), announcing to the subject a time that was either half the subject's time or twice the subject's time, respectively. In order to make sure the subject realized the time ratio, the experimenter commented by saying "Oh, your partner (opponent) was almost exactly twice as fast as you!" or "Oh, you were almost exactly twice as fast as your partner (opponent)!", respectively.

The experimenter added the two times aloud and presumably checked a list for how much money had been earned. The amount was always 30 Deutsche Mark (DM). The experimenter then explained the subject that, in previous experiments, most subjects have preferred that one of them, as opposed to the experimenter, decides how to split the money. It had also been found that most subjects would like to determine the role of the allocator by lot. The subject was then asked to draw a lot. Faked lots were used to assign the allocating role to the subject. No subject protested against this procedure or required a different procedure. The experimenter gave the subject 30 DM coins and asked the subject to split the money in a way that was fair. The experimenter would give the other person her share.

The amount of money kept by the subject served as the dependent variable. After subjects had decided how to split the money, they were thanked by the experimenter for their participation and given an appointment for debriefing. Immediate debriefing was not possible due to the procedure for measuring attitudes.

#### Procedure for Measuring Attitudes

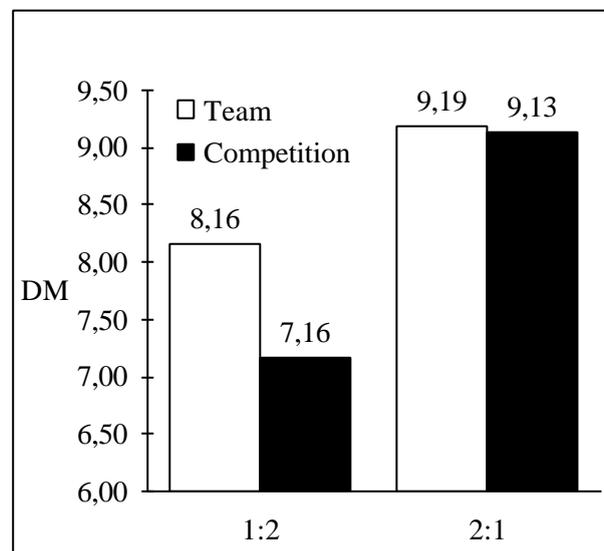
After subjects left the experimental room, they were followed inconspicuously by another experimenter who waited for an opportunity to contact the subject. Subjects were asked to fill in a questionnaire for the supposed purpose of a study to standardize questionnaires for a methodology class. Most subjects agreed to participate. Subjects who refused were dropped from the sample. Subjects who cooperated were led to a room and given the justice inventory. They were asked to fill in all items, drop the questionnaire in a box when finished, and leave on their own. The experimenter thanked them for participating and left. This author, whose office was next door, intercepted the subjects when they left the room. He introduced himself and explored whether the subject had noticed a connection between the two studies. Four subjects recognized a similarity between the content of Bossong's (1983) items and the distribution of money in the experiment. It appeared, however, that three of these subjects realized the connection only during the interview. The fourth subject (who happened to be a first year psychology student) suspected that the two studies belonged to the same research and was, therefore, dropped and replaced.

### *Results*

#### Attitude Scales

A series of factor, item, and reliability analyses for all items and various subsets of items were conducted to investigate their factorial structure, reliability, as well as their convergent and discriminant validity. For space reasons, the results of these analyses cannot be described in detail here (cf. Schmitt et al., 1994, 1995). To summarize, the convergent and discriminant validity of the scales was

only partially satisfactory. In factor analyses with all items, the equity items tended to load on two or three factors -- depending on the number of factors that were extracted. At the same time, not all need and equality items could be separated from each other, i.e., some need and some equality items loaded on a common factor while other need items and other equality items had their own factors. Not surprisingly, the factorial validity was better if author-specific items were factor analysed separately. Different scholars seem to connect different meanings with the same principles and translate (operationalize) them in idiosyncratic ways. Since no criterion exists for the "true " meaning of the concepts and their "correct" operationalization, it seems reasonable to combine the items from the different authors into comprehensive scales. These comprehensive scales cover a broad conceptual range and contain a more representative sample of the hypothetical universe of operationalizations than each author-specific scale alone. Furthermore, the formation of comprehensive scales can be justified statistically: Coefficient alpha for the equity scale (34 items, including Bossong's items) was .88 with item-total correlations ranging from .18 to .54. Alpha for the comprehensive equality scale (24 items) was .85 with item-total correlations ranging from .16 to .70. Alpha for the comprehensive need scale (7 items) was .71 with item-total correlations ranging from .15 to .34. The correlations between the comprehensive scales amounted to -.27 (equity, equality), -.18 (equity, need), and .51 (equality, need). Similar values were obtained in analyses using the samples of the remaining experiments as well as in analyses using the samples from all experiments simultaneously. According to the reported coefficients, attitude toward equity tends to correlate slightly negatively with the remaining two attitudes, while the attitudes toward need and equality overlap substantially. However, this overlap is small enough (25% shared variance) to warrant the maintenance of two distinct attitude constructs. Scale scores were standardized for statistical analyses by taking mean items scores with a possible range from 1/most negative attitude to 6/most positive attitude.



*Figure 3*

Experiment 1: Mean Amount of Money (DM) Kept by Subjects Depending on Relative Achievement and Social Context

Effects of Experimental Factors

A two (Relative Achievement) by two (Social Context) by two (Need) by two (Gender) between subjects analysis of variance revealed significant main effects for Relative Achievement [ $F(1, 112) = 48.34, p < .01$ ] and Social Context [ $F(1, 112) = 6.06, p < .05$ ], as well as a significant interaction of these two factors [ $F(1, 112) = 4.72, p < .01$ ]. The main effect of Relative Achievement and the interaction effect had been expected. No main and interaction effects were found for Gender. Contrary to expectations, no main effect for Need and no interaction between Need and Social Context were obtained. The means for the significant effects are displayed in Figure 3. As expected, winners kept more money than losers. The social context makes the expected difference only in the Losing Condition. This unexpected pattern implies a main effect of Social Context.

#### Person-situation interaction Effects

Multiple regression analyses with product variables were run for testing the person-situation interaction hypotheses (Aiken & West, 1991). Experimental factors were dummy coded. Product terms were created by multiplying dummy variables with each other and with the attitude variables. Technically, the regression analyses were performed stepwise. In the first step, all dummy variables and their products were entered. This step corresponds to a three-way analysis of variance of the experimental factors. In the second step, the attitude variable at issue was entered. Although no main effects were predicted for the attitude scales, their inclusion is necessary for estimating the unique interaction effect (Cohen, 1978). In the third step, the products between corresponding dummy and attitude variables were entered to test the effect of the partialled product which represents the unique interaction effect. None of the predicted person-situation interaction effects were significant.

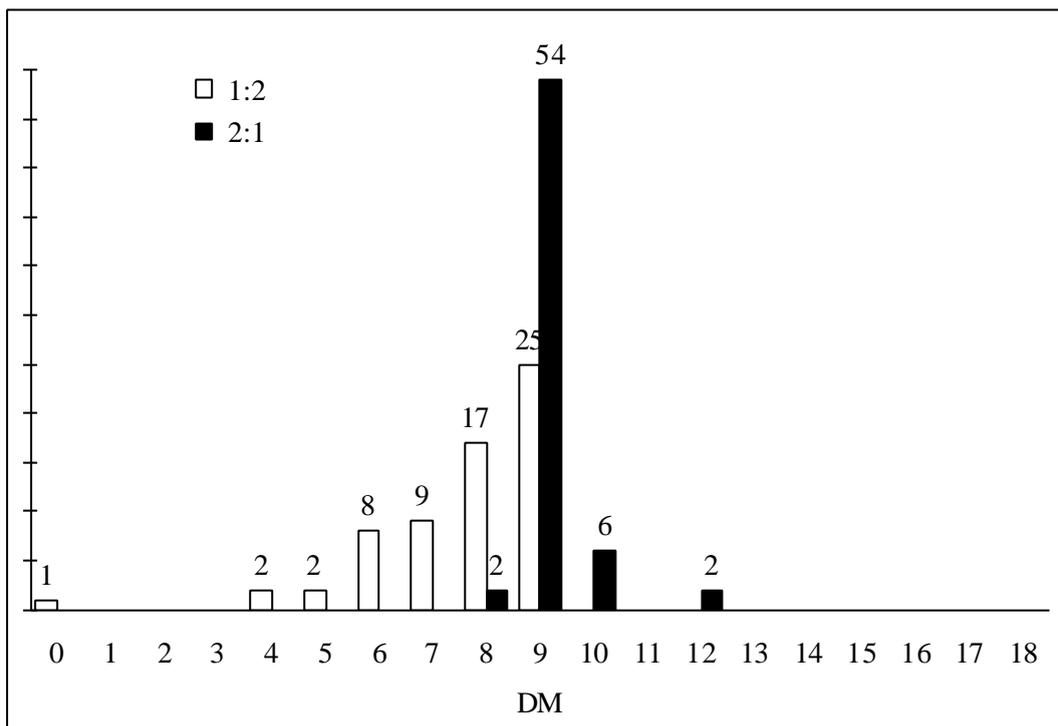
### *Discussion*

In search for an explanation of this unexpected result, it may be useful to consider some important differences between the Herrmann and Winterhoff (1980) research and the present experiment. A first difference is subjects' age. Herrmann and Winterhoff's subjects were 12 year old adolescents, while the subjects of the present experiment were adults. A second difference is type of reward. In Herrmann and Winterhoff's experiments, rewards were tokens. Although the subjects could convert them into items with material value, tokens may have less economic appeal than money-- which is the most obvious economic value in our society. A consequence of both differences may be that Herrmann and Winterhoff's adolescent subjects considered the experiment more as a game, while the adult subjects of the present experiment took the experiment as a serious economic transaction. A third difference between the studies is anonymity vs. acquaintance with partner/opponent. The subjects in Herrmann and Winterhoff's experiments did not meet the person against whom they competed, whereas the subjects in the present experiment were introduced to and had a brief conversation with their partner/opponent before getting involved in their task.

A likely consequence of these differences between the studies is that the adult subjects in the present experiment were more concerned with the social adequacy of their behavior than were the adolescent subjects in the former experiments. For the latter subjects, social norms regarding an appropriate distribution may not have been salient due to the kind of reward to be allocated. Furthermore, the personal interaction of the subjects of the present experiment with their partner/opponent may have raised their awareness of the social norm and/or their complicity with these norms given the possibility of social disapproval.

Although these post hoc hypotheses cannot be tested directly, they are consistent with some interesting aspects of the results. In both studies, the average amount of tokens or money kept by win-

ners was less than what they deserved according to the equity principle. Instead of 20 tokens, Herrmann and Winterhoff's subjects kept an average of 17.34 tokens. The corresponding value in the present experiment was remarkably lower. Instead of two-thirds (12 DM), subjects kept almost exactly half of the money (9.16 DM). More importantly, over 80% of the winners kept exactly 9 DM (cf. Figure 4). Apparently, the subjects would have considered it inappropriate to take more than half of the money even though their achievement would have justified them taking two-thirds of the money. Similar results have been found in other studies and interpreted as evidence for a politeness ritual, generosity ritual, or modesty norm (Deutsch, 1985; Greenberg, 1978; Mikula, 1980; Schwinger, 1980).



**Figure 4**

Experiment 1: Number of Subjects who Kept Certain Amounts of DM, Depending on their Relative Achievement (N = 128)

The politeness, generosity, or modesty norm must have been powerful in the present experiment because the extent of consensus among the winners regarding a fair distribution of rewards is striking. This consensus is exactly what Mischel (1973), Price and Bouffard (1974), and other writers have called a strong situation. Having performed less well than one's partner seems to be a weaker situation in this sense. Although most subjects kept 9 DM under this condition as well, there was considerably more variation (cf. Figure 4).

The conditional distributions of the dependent variable displayed in Figure 4 provide a statistical explanation for the lack of person-situation interactions. Let us consider the first of the four expected interaction effects: A synergetic interaction between Relative Achievement and Attitude Toward Equity would imply a steeper regression line in the winning rather than in the Losing Condition (cf. Figure 1). The restriction of range of the dependent variable in the Winning Condition counteracts this

expected pattern. The regression line is flattened to the extent that its slope no longer differs significantly from the slope of the regression line in the Losing Condition. In other words, the difference in behavioral variability between the Winning and the Losing Conditions disguises the synergetic interaction. The corresponding substantive explanation is that normative restrictions uniform subjects' behavior in the Winning Condition more than in the Losing Condition. Due to this difference in normative restrictions, the Winning Condition leaves less room for individual differences in attitudes to come into play and this spoils the expected synergetic interaction.

Although this post hoc explanation is consistent with the data, it would be more convincing if it were tested more directly by releasing the normative constraints in the Winning Condition experimentally. Several means can be considered for this purpose: First, the social control could be reduced to decrease the subjects fear of social disapproval. Second, the subject's cost-benefit-ratio could be shifted toward violating the social norm by increasing the incentive for norm-discrepant behavior. Third, the person's responsibility for the final outcome could be reduced. This would create the possibility of excuses for the subject in cases of anticipated or actual social disapproval. Fourth, the role of the subject could be changed from recipient to judge in order to make the modesty rule irrelevant. All four strategies were implemented in separate experiments. Unless stated otherwise, the rationale and the procedure of these experiments corresponded to those of Experiment 1. The same is true for the hypotheses and for the data analyses. For space reasons, only crucial differences between the remaining experiments and Experiment 1 will be mentioned.

### **Experiment 2: Reducing Social Control<sup>2</sup>**

In this experiment, social control by the subject's partner/opponent was reduced by keeping them anonymous to the subject as in Herrmann and Winterhoff's (1980) two experiments. Additionally, Experiment 2 differed slightly from Experiment 1 in that the Need Factors from Experiment 1 were dropped. This was done because the situational Need Factor had no effect in Experiment 1 and because the Attitude Toward Need Scale had the poorest reliability (see above). The same hypotheses as in Experiment 1 were considered except for those regarding the Need Factors.

#### ***Method***

With the exception of disregarding the Need Factors, the design was identical to the design of Experiment 1. Because fewer factors were considered and fewer effects tested, fewer subjects were needed to have the same statistical power as in Experiment 1. A total of 112 students were recruited as subjects. Except for meeting their partner/opponent in a waiting room, the experimental procedure corresponded to the procedure of Experiment 1. Attitudes were measured in the same way and the same dependent variable was taken as in Experiment 1.

The cover story had to be changed slightly. Subjects were told that with the availability of networks like Internet, computer work would be done more often at home (telework). One of the research questions of this study was to find out whether knowing one's coworker (partner/ opponent) made a difference regarding achievement. In this case, the Telework Condition would be realized and the subject would not meet the other person.

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<sup>2</sup> The following students participated in conducting this experiment in partial fulfillment of course requirements: Tina Eggers, Wibke Hoenen, André Kunnig, Julienne Ott, Gisela Wagensohn, Bernd Ziegler. The study was funded by Trier University.

### Results

A two (Relative Achievement) by two (Social Context) by two (Gender) between subjects analysis of variance revealed a significant main effect for Relative Achievement [ $F(1, 104) = 28.91, p < .01$ ] only. The means in Figure 5 show that, in contrast to Experiment 1, Social Context no longer moderates the effect of Relative Achievement. Apparently, working with vs. against someone makes little difference if that person is unknown.

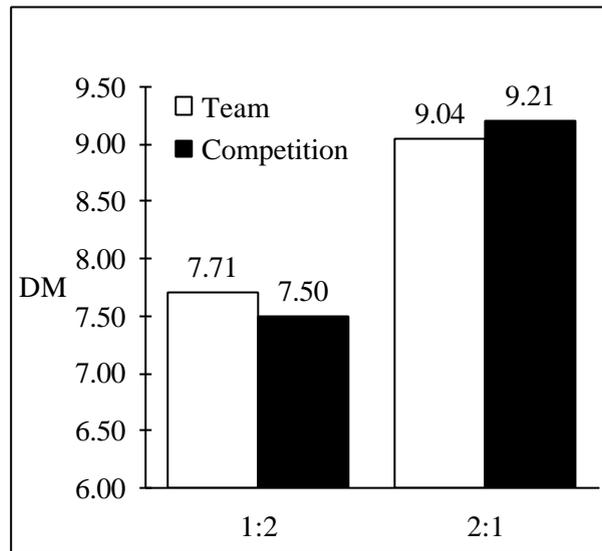
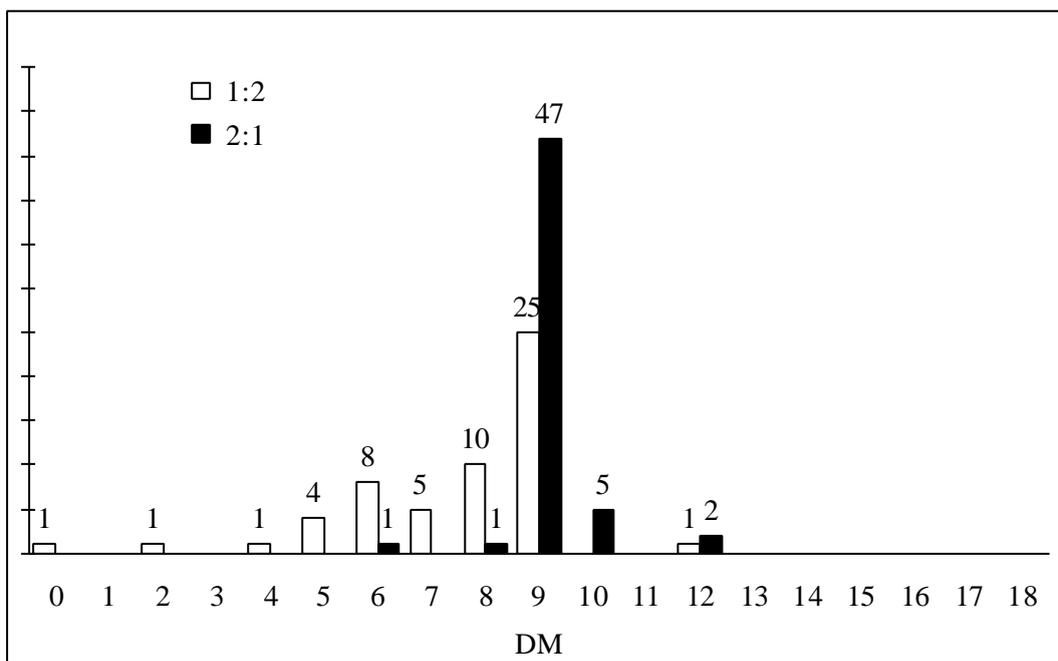


Figure 5

Experiment 2: Mean Amount of Money (DM) Kept by Subjects Depending on Relative Achievement and Social Context



### **Figure 6**

Experiment 2: Number of Subjects who Kept Certain Amounts of DM, Depending on their Relative Achievement (N = 112)

Contrary to what might be expected from this change in results compared to Experiment 1, normative constraints on subjects' allocation behavior could not be relaxed successfully by keeping the partner/opponent anonymous. The conditional distributions in Figure 6 reveal only very slight changes compared to Experiment 1 (cf. Figure 4). In the Winning Condition, the distribution of the dependent variable was almost identical. In the Losing Condition, a slight shift toward a bimodal distribution can be observed, the modes corresponding to a perfectly equal (9 DM) and a perfectly equitable (6 DM) allocation of money, respectively. However, given that the variability of allocation behavior differs as much as in Experiment 1 between the Winning and the Losing Conditions, it is not surprising that the expected person-situation interactions are again not significant.

### **Experiment 3: Increasing Incentives for Violating Social Norms<sup>3</sup>**

It is easy to be modest and polite if not much can be won by violating these social expectations. Eighteen Deutsch Marks may not be worth risking social disapproval even for students and even if this money can be made in a short amount of time. It may be more tempting to behave in a nonmodest and nonpolite fashion if a considerably larger amount of money can be earned by "deviant" behavior. Subjects should experience a conflict between maximizing material gains and minimizing social costs (disapproval). In such a situation of conflict, individuals may search for additional decision criteria. It is suggested that personal norms and attitudes serve this function. In order to test this conjecture, the amount of money to be allocated was varied in the present experiment, ranging from a low of 18 DM to a high of 72 DM with 36 DM and 54 DM as intermediate values. It was expected that with increasing amounts of money, subjects would experience a conflict between material and social gains and, consequently, rely more on internal standards than in situations where such a conflict does not exist. As a consequence of the increasing relevance of attitudes and individual differences in attitudes, an increasing variability in allocation behavior can be expected with increasing amounts of money. Statistically, this reasoning implies that the size of a synergetic interaction between attitudes and relative achievement would increase with the amount of money to be allocated. Since this second-order interaction is expected to have an ordinal form, the first-order interactions predicted in the first two experiments were expected as well.

### **Method**

One hundred and twelve student subjects were randomly assigned to treatment conditions. As in Experiment 2, subjects did not meet their opponent. Two experimental factors were fully crossed: Relative Achievement (2:1 vs. 1:2) and Amount of Money (18 DM, 36 DM, 54 DM, 72 DM). Given that this design included eight experimental conditions, Social Context was not varied for reasons of parsimony. Subjects were always told to compete with the other person. Attitudes were measured as in the previous two experiments.

### **Results**

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<sup>3</sup> The following students participated in conducting this experiment in partial fulfillment of course requirements: Waldemar Kühn, Tanja Wichern, Andreas Wimmer. The study was funded by the Minister of Science and Education of Rhineland-Palatinate.

The dependent variable was converted before analyses from absolute values (DM) into percentages within money conditions. This was done to avoid an artificial main effect of the Money Factor and to ease the comparison of means across the levels of this factor. A two (Relative Achievement) by four (Amount of Money) by two (Gender) between subjects analysis of variance revealed a significant main effect for Relative Achievement [ $F(1, 97) = 37.08, p < .01$ ] only. The expected interaction between Relative Achievement and Amount of Money, which is an implication of the reasoning outlined above, was not significant. An inspection of the means shows that the percentages of money kept by the subjects differed only slightly between money conditions. In the Winning Condition, the means for the four money conditions amounted to 54%, 52%, 53%, 55%, respectively. The percentages for the corresponding Losing Conditions were: 40%, 41%, 41%, 42%. Contrary to expectations, subjects did not keep a larger share of the money as the total amount of money increased. Furthermore, the expected increase of behavioral variability in the Winning Condition did not occur. Consequently, the predicted person-situation interaction effects were again not significant.

#### **Experiment 4: Reducing Subjects' Responsibility<sup>4</sup>**

A third attempt was made to lessen the normative constraints in the Winning Condition by reducing subjects responsibility for the final outcome. This was realized by having subjects allocate chances to win money instead of having them distribute money directly. Subjects were asked to allocate tokens. They were told that all tokens from all members of the study would participate in a lottery in which 100 DM, 200 DM, or 300 DM could be won. Subjects were told that the probability of winning depended on the number of tokens each person submitted in the lottery. Due to this procedure, subjects were relieved from the full responsibility for the final outcome of their behavior. Subjects realized that chance would operate as an intermediate causal variable and this would enable them to excuse themselves from undesirable outcomes (their partner/opponent not winning) because these could be attributed externally to chance. In this situation, it should be less threatening for subjects to violate modesty, generosity, and polite norms which otherwise constrain their behavior in the Winning Condition.

#### ***Method***

One hundred and twelve student subjects were randomly assigned to treatment conditions. The design (Relative Achievement and Social Context) and the procedure were adopted from Experiment 2 except that subjects met their partner/opponent before the experiment. As in Experiment 1, this person was a confederate. After subjects had performed the puzzle and were given false feedback on their relative achievement, they were asked to split 18 tokens between themselves and the other person. Attitudes were measured as in the previous experiments.

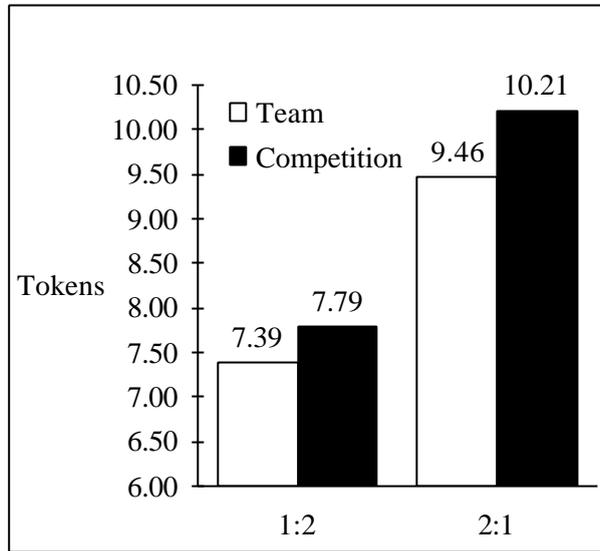
#### ***Results***

A two (Relative Achievement) by two (Social Context) by two (Gender) between subjects analysis of variance revealed a significant main effect for Relative Achievement [ $F(1, 104) = 23.47, p < .01$ ] only. The means in Figure 7 suggest an additional main effect of Social Context. The means did not differ significantly, however ( $F(1, 104) = 2.85, p = .095$ ).

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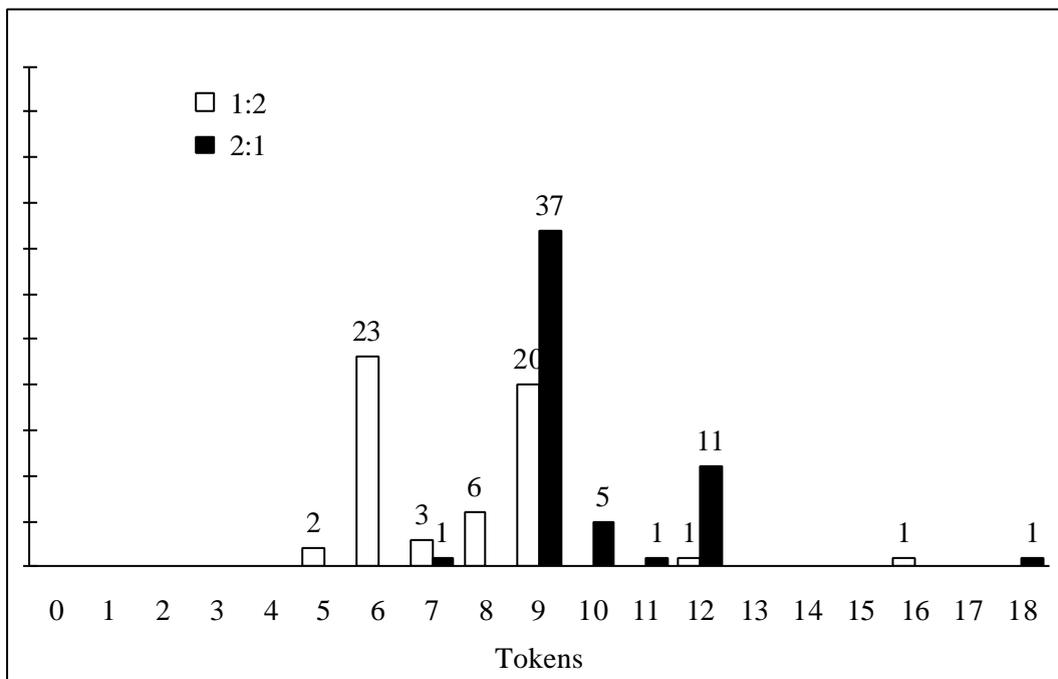
<sup>4</sup> The following students participated in conducting this experiment in partial fulfillment of course requirements: Anke Boße, Ina Finke, Gitta Glöcklhofer, Martina Mensching, Inga Plewe. The study was funded by Trier University.

Replicating all previous studies, the means in Figure 7 show the predominant impact of the Relative Achievement Factor. Subjects with inferior achievement kept significantly less tokens for themselves than subjects who won. Once again, subjects in the Losing Condition tended more toward an unequal distribution than subjects in the Winning Condition.



*Figure 7*

Experiment 4: Mean Amount of Tokens Kept by Subjects Depending on Relative Achievement and Social Context



*Figure 8*

Experiment 4: Number of Subjects who Kept Certain Amounts of Tokens, Depending on their Relative Achievement (N = 112)

However, the conditional frequency distributions of the dependent variable (Figure 8) differ remarkably from the previous experiments and show that the present procedure was successful in relaxing normative constraints. A bimodal distribution was now obtained for both Relative Achievement Conditions. Subjects in both the losing and the Winning Condition tended to behave either according to the equality principle or to the equity principle. Consequently, the prerequisites for synergetic person-situation interaction effects are given.

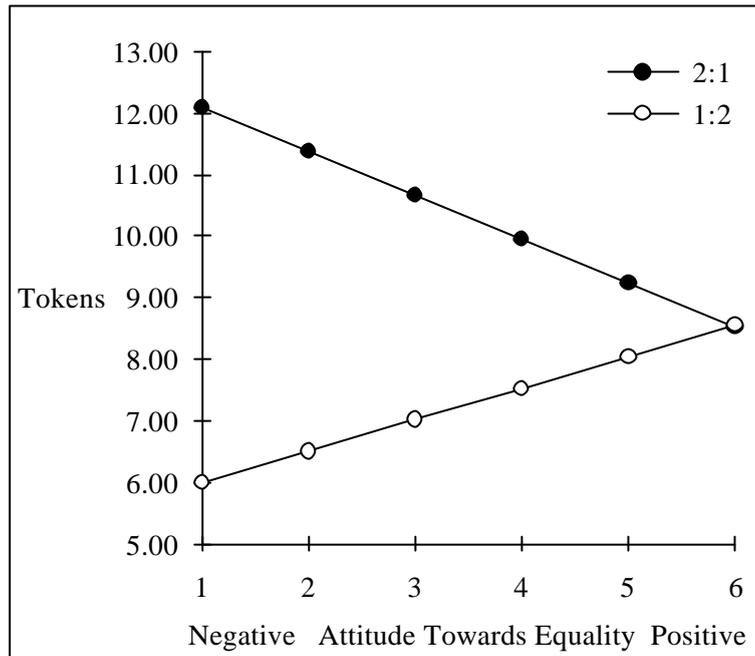


Figure 9

Experiment 4: Interaction of Relative Achievement and Attitude Toward Equality

Indeed, one of the two interaction effects that were expected was significant: Attitude Toward Equality interacts significantly with Relative Achievement ( $F(1, 105) = 5.76, p < .05$ ). As can be seen from Figure 9, the direction of the effect, which explained 3% of the variance of the dependent variable, is consistent with expectations. The fitted conditional regression lines show that the more favorable subjects' attitudes toward equality are, the less they take achievement differences between themselves and their partner/opponent into account when allocating rewards.

**Experiment 5: Changing the Subject's Role<sup>5</sup>**

In all experiments that were presented so far, the subject acted in a combined role, being both a recipient and an allocator at the same time. Although this role has been chosen many times in distribu-

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<sup>5</sup> The following students participated in conducting this experiment in partial fulfillment of course requirements: Claudia Dombrowsky, Anke Larro-Jacob, Michaela Puschus, Dagmar Thiex, Anja Wiest. The study was funded by the Minister of Science and Education of Rhineland-Palatinate.

tive justice research (cf. Mikula, 1981; Törnblom, 1992), it may be a core factor in masking synergistic person-situation interactions. Being a recipient and an allocator at the same time creates a delicate situation because selfish behavior is easily possible. Subjects in the Winning Condition have reason to fear that their partners/opponents see an equitable distribution not as a just but as selfish. Fearing social disapproval may lead the subject to distribute the money equally. This would not only be an effective prevention of criticism, but also would present the subject in a favorable light: as a modest, considerate, polite, and generous person (Deutsch, 1985; Greenberg, 1978; Mikula, 1980; Schwinger, 1980).

In order to test this conjecture, the role of the subject was changed in the present experiment. Subjects no longer acted as recipients and allocators, but only as allocators. They observed two other individuals perform the same task that was used in the previous experiments: solving a computer puzzle. The two target individuals were portrayed as opponents who competed against each other. The targets performed unequally well and the subject was asked to distribute their common reward fairly between them. In order to avoid any concerns regarding social disapproval on behalf of the targets, subjects remained anonymous to the targets. Hence, there was no need and no possibility for self-presentational behavior toward the recipients. Furthermore, no expectation other than following the instruction of the experimenter and rendering a fair decision was likely to be perceived or construed in this situation.

### *Method*

#### Cover Story, Stimulus Material, Procedure, and Dependent Variable

The cover story from Experiment 1 (see above) was changed in two regards. First, it was said that the Same Room Condition was realized this time. Second, the subject was told that a neutral third person was needed to allocate rewards. Previous experiments had shown that subjects did not like experimenters allocating rewards and that a neutral, anonymous peer was accepted best. The subject was assigned that role. No subject expressed doubts about the authenticity of this procedure.

Subjects were told that they would see a live TV transmission because this would be the only technically feasible procedure to guarantee their anonymity. In truth, subjects saw video films that had been prepared earlier. As in other justice experiments (e.g. Lerner & Simmons, 1966), video films were used for economic reasons and to keep the situation constant for all subjects. Subjects were advised by Experimenter 1. Videos were started and stopped from an adjacent room by Experimenter 2. Natural but standardized conversation via intercom between Experimenter 1 and 2 served to time the video and to convince the subjects of watching a live transmission. Very few subjects suspected spontaneously, or when interviewed after the experiment, of having viewed a video. These subjects who did were dropped and replaced.

Subjects were recruited individually and led to the experimental room. Experimenter 1 told them that they would soon observe the two other subjects compete against each other in a computer puzzle. Depending on the time they needed together, they would earn a certain amount of tokens. The subject's task would be to suggest a fair distribution of the tokens. The tokens would take part in a lottery in which 100 DM, 200 DM, or 300 DM could be won.<sup>6</sup>

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<sup>6</sup> This procedure was adopted from Experiment 4 for two reasons: Although the social setting of the present experiment differs from the setting of Experiment 4, the experimenter may function as an implicit normative authority. Since unequal distributions of material resources (especially money) are socially less desirable among German

After this instruction, Experimenter 1 called Experimenter 2 via intercom. Before calling, Experimenter 1 mentioned casually to the subject that she would be calling the camera person. Experimenter 1 asked Experimenter 2 whether the other two subjects had already arrived. Experimenter 2 said that they were already waiting. A video was then started that showed a still view into the room in which the competition would take place. After a few seconds, three persons entered this room: Experimenter 3 and two male students, presumably the target subjects. In truth, the targets were confederates who had received, like Experimenter 3, considerable training for acting their roles. Experimenter 3 explained the puzzle and the rules to the targets. She then started the competition. Targets were trained to solve the puzzle in a certain amount of time. After both had finished, Experimenter 3 announced the times they had needed. This served to manipulate Relative Achievement (see below). Experimenter 3 wondered aloud in a casual manner why one target had been so much faster than the other. The winning target suggested an explanation that was confirmed by the losing target. This served to manipulate Attribution of Achievement (see below). Experimenter 3 thanked the targets for participating and left the room together with them. A few seconds later, the video was stopped.

Experimenter 1 added the times that the targets had needed and presumably checked a list for the amount of tokens they deserved. The answer was always 12 tokens. After having suggested a fair distribution, the subject was explored by Experiment regarding doubts about the authenticity of the procedure. Three subjects suspected having seen a video. They were dropped and replaced. Subjects were thanked for their participation and given an appointment for debriefing.

The number of tokens the subject allocated to the winner served as the dependent variable. Attitudes were measured in the same way as in Experiments 1 through 4.

### Design and Subjects

Three experimental factors were fully crossed and varied between subjects: The first factor was Relative Achievement. It had two levels: 2:1 and 3:1. The levels from the previous experiments could not be adopted because the subject was no longer a corecipient. In the 2:1 (3:1) Condition, the losing target needed approximately twice (three times) as long as the winning subject. When Experimenter 3 announced the times, it was said in a surprised fashion to the winning target: "Oh, you were almost exactly twice (three times) as fast!" The second factor was Attribution of Achievement. This factor had two levels: In the Effort Condition, the winning target said: "I really tried very hard to be fast." The losing target added: "I guess I didn't put enough effort into winning." In the Talent Condition, the winning target said: "I have always been good at these things." The losing target said: "I know I don't have much talent for these kinds of things." The third factor was manipulated to control for irrelevant effects, such as sympathy effects, which may originate from the actors' idiosyncratic physical and behavioral appearance. In one condition of the Actor Factor, Person A won and Per-

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citizens than equitable distributions (Törnblom & Foa, 1983), subjects may feel that unequal distributions require more justification than equal distributions. According to Experiment 4, this normative bias toward an equal distribution can be reduced by having subjects distribute chances to win money as opposed to money. The second reason for the procedure was that it made easily possible to treat the subject in the same way as the targets. Subjects were told that they would participate in a separate lottery in which the same amount of money could be won. However, their chances to win would neither depend on the targets' performance nor on their vote. This part of the procedure was designed to prevent that personal interests and fairness concerns regarding the subject's outcome would affect allocation decisions.

son B lost. In the second condition, these roles were reversed. Consequently, eight different versions of the video were made and used.

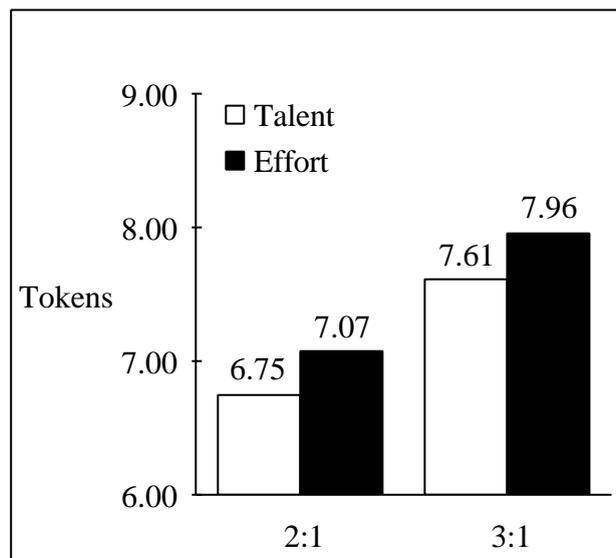
A total of 112 students from Trier University (no advanced psychology students) were assigned randomly to the experimental conditions. Gender of subject was always balanced.

### *Hypotheses*

Regarding the situation factors, a main effect of Relative Achievement was expected. Winners who were three times as good as their opponent were expected to deserve a larger share of tokens than winners who had been twice as good. Additionally, an ordinal interaction effect between Relative Achievement and Attribution of Achievement was predicted with controllable achievements (effort) leading to a larger achievement effect than uncontrollable achievements (talent). This expectations follows from attribution theory (Shaver, 1985) and has been confirmed in previous research (Lamm & Kayser, 1978). As a consequence of ordinal interaction, a main effect of Attribution was expected as well.

Regarding the person-situation interactions, the same first-order interactions between Attitude Toward Equity/Attitude Toward Equality (person factors) and Relative Achievement (situation factor) were expected as in the previous experiments. Additionally, it was predicted that these first-order interactions would be moderated by the Attribution Factor since the cause for an achievement difference can provide an additional justification for or against a differential distribution of rewards. In accordance with the expected situation effects, the first-order attitude-achievement interactions were expected to be larger in the Effort Condition than in the Talent Condition.

### *Results*

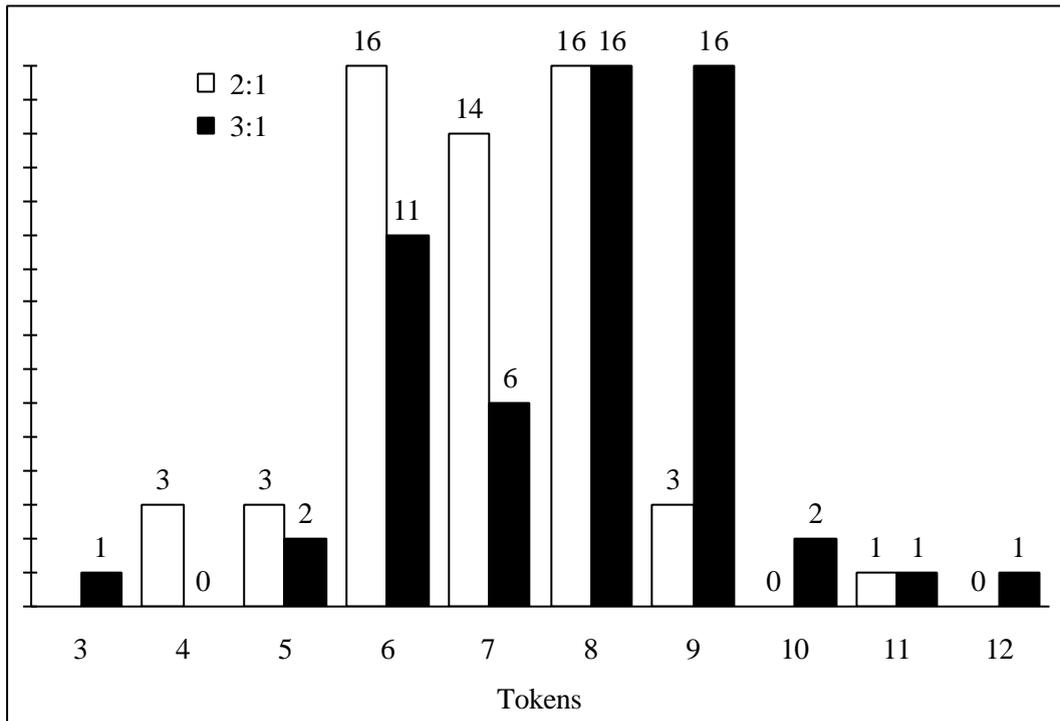


*Figure 10*

Experiment 5: Mean Amount of Tokens Allocated to Winner Depending on Relative Achievement and Attribution of Achievement

A two (Relative Achievement) by two (Attribution) by two (Actor) by two (Gender) between subjects analysis of variance revealed a significant main effect for Relative Achievement [ $F(1, 96) = 21.44, p < .01$ ] only. The control factors Gender and Actor had virtually zero effects. There was a slight, albeit nonsignificant main effect of the Attribution Factor in the expected direction (cf. Figure 10). The predicted interaction between Relative Achievement and Attribution was virtually zero.

Figure 11 gives the conditional distributions of the dependent variable in the two Relative Achievement Conditions. The distributions are bimodal in both conditions. In the 2:1 Condition, most subjects chose either the equity or the equality principle for a fair allocation of rewards. A smaller percentage decided to compromise between both principles. In the 3:1 Condition, the majority of subjects either allocated exactly according to equity (winner gets 9 tokens) or according to a compromise between both principles with more weight on equity than on equality (winner gets 8 tokens). A considerable proportion (11 subjects) allocated exactly according to the equality principle and 6 subjects chose a compromise with more weight on equality than on equity (winner gets 7 tokens).

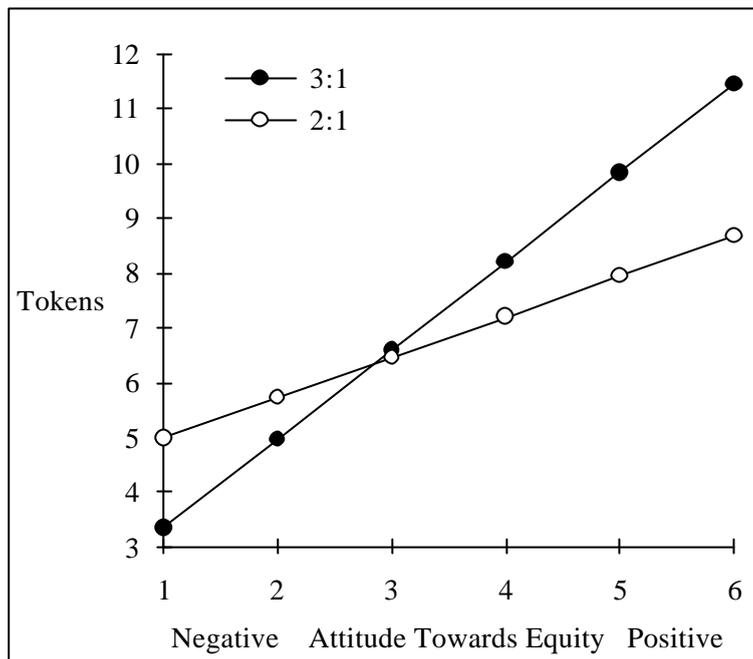


*Figure 11*

Experiment 5: Number of Subjects who Allocated Certain Amounts of Tokens to the Winning Target Depending on Relative Achievements

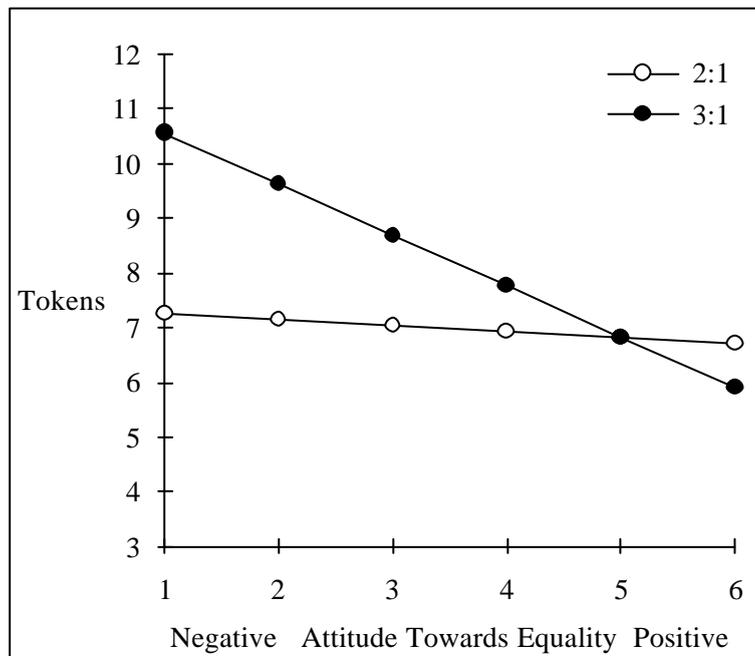
Overall, the experimental setting seems to have been successful in avoiding normative restrictions on subjects' allocation behavior. Consequently, synergetic person-situation interactions should not be masked. Indeed, a significant interaction effect was obtained both for Attitude Toward Equity x Relative Achievement [ $F(1, 108) = 4.24, p < .05$ ] and for Attitude Toward Equality x Relative Achievement [ $F(1, 108) = 4.53, p < .05$ ]. Both effects explain 4% of the variance of the dependent variable when estimated separately. However, the two effects overlap. When both interactions are considered simultaneously, the F-values for their estimated unique effects drop below the level of significance. The predicted second-order synergetic interactions (Attitude x Achievement x Attribution) are not significant. This is not surprising given the nonsignificant Achievement x Attribution interaction.

As can be seen from Figures 12 and 13, the directions of the two significant person-situation interactions are consistent with theoretical expectations. The fitted regression lines in Figure 12 show that subjects with a positive attitude toward equity put more weight on achieve-



*Figure 12*

Experiment 5: Interaction of Relative Achievement x Attitude Toward Equity



*Figure 13*

Experiment 5: Interaction of Relative Achievement x Attitude Toward Equality

ment differences than subjects with a neutral or ambivalent attitude. Subjects with a negative attitude toward equity even act paradoxically: They tend to give winners less than losers and this even more so in the 3:1 Condition than in the 2:1 Condition. Perhaps these subjects feel that winning is already rewarding enough and should not be additionally rewarded, while losing "deserves" a compensation.

Another explanation can be derived from the close semantic relation between the "equity" concept and the "achievement" concept. Individuals with a negative attitude toward equity reject the achievement principle and this may be the reason why they would allocate even less than half of the reward to winners. Perhaps they want to punish achievement-oriented behavior and reward noncompetitive behavior. Both explanations are speculative, however, and cannot be tested by the available data.

The pattern for Attitude Toward Equality is opposite to the one just described. As can be seen from the fitted regression lines in Figure 13, subjects tend to allocate unequally and weigh achievement differences more if they have a negative attitude toward equality. This pattern is perfectly consistent with theoretical predictions and with the pattern of results obtained in Experiment 4 (cf. Figure 9).

### **Vignette Studies**

If the reasoning which has led to Experiment 5 is valid, synergetic person-situation interactions in allocation behavior and justice judgments should also not be masked in vignette studies. In this type of research, subjects are given descriptions of hypothetical or real allocation conflicts. They are asked to either suggest a fair distribution, or, if a distribution has been decided already, to judge how fair it is. The scenarios are usually constructed according to an experimental or facet design. Typical facets are kind of resource, value of resource (reward vs. punishment), social context, and distribution principle (e.g. Sabbagh et al., 1994; Schmitt & Montada, 1982; Törnblom & Foa, 1983).

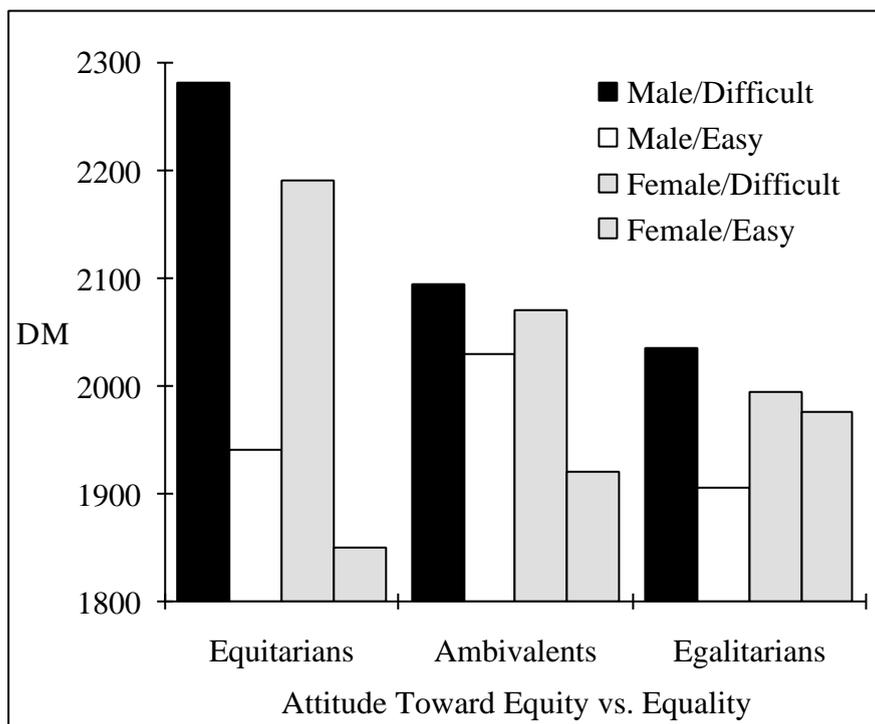
Although it would be easy to instruct subjects to act as if they were corecipients or as if they would identify with one of the recipients, this is typically not done. Rather, subjects are usually put into the role of a third party or judge who is as neutral as possible. This is at least what the subject is explicitly asked. Of course, the possibility can never be excluded that subjects identify with one of the recipients and act as if they were that person. But even in this case is it unlikely that such an identification would lead to strong biases and normative restrictions of behavior. This assumption seems safe for two reasons: First, other corecipients are either hypothetical (nonexisting) or not present in vignette studies. Therefore, subjects can make their decisions and judgments without fearing disapproval of those with whom they have a (distribution) conflict. Second, subjects' behavior usually has no real consequences for them. Nothing can be won or lost from suggesting a solution to a hypothetical conflict or from a judgment regarding a hypothetical solution. Consequently, there is little reason to fear suspicion regarding the person's true motives.

It follows from this analysis of the subject's role in vignette studies that synergetic person-situation interactions should not be masked by normative restrictions, and that attitudes toward distribution principles operate in the same way as moderators of situation effects as in Experiment 5. As a matter of fact, two vignettes studies that have been designed according to the methodological framework of interactionism support this conclusion.

### ***Fair Income on the First Job***

Fifty-six female university students served as subjects in Bossong's (1983) study on fair income. The design included two experimental factors and one attitude factor. The first experimental factor was Gender of Protagonist. The second experimental factor was Difficulty of Training and had two levels (low difficulty, high difficulty). Difficulty was varied by describing the protagonist's major professional training [e.g., Nuclear Physics (high difficulty); Business Administration (low difficulty)] and the topic of the diploma thesis. Attitude toward Equity vs. Equality was measured with a newly developed instrument (see above). Subjects were split into three groups of approximately equal size based on their scale scores (equitarians, egalitarians, ambivalents). Subjects were described the curriculum vitae of eight individuals (two protagonists for each experimental condition) who had graduated from a university and who were applying for their first job. Subjects were asked to give the monthly net income they would consider appropriate for the protagonist's first job. The average value across the two protagonists within each cell served as the dependent variable.

A two (Gender of Protagonist) by two (Difficulty of Training) by three (Attitude) between subjects analysis of variance revealed a significant main effect for Gender of Protagonist [ $F(1, 52) = 5.6$ ;  $p < .05$ ], a significant main effect for Difficulty of Training [ $F(1,52) = 39.9$ ;  $p < .01$ ], and a significant interaction for Difficulty x Attitude [ $F(1,52) = 7.3$ ;  $p < .01$ ]. Regarding this latter effect, the means in Figure 14 show that, in line with the synergetic hypothesis, subjects with a strong preference for equity weigh input differences (Difficulty of Training) more than subjects with an ambivalent attitude or than subjects with a strong preference for equality.



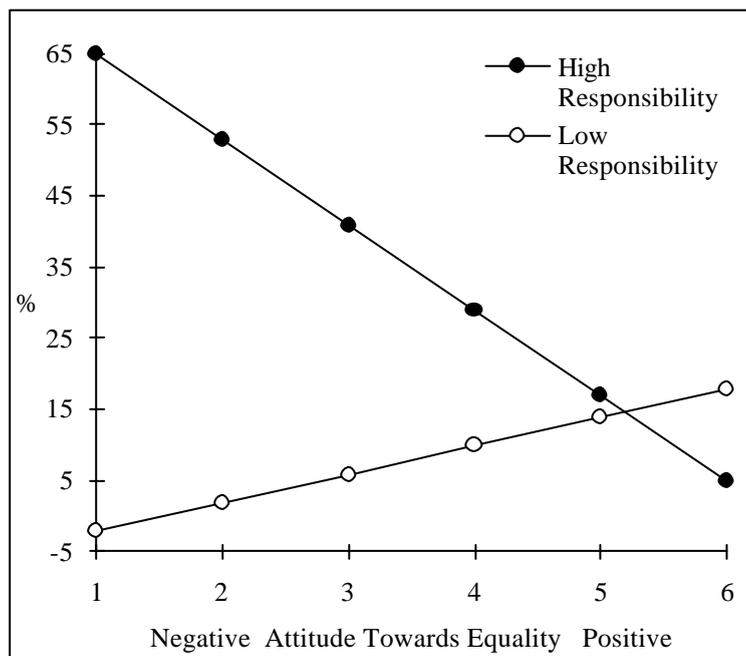
**Figure 14**

Fair Income for Male and Female Graduates with Easy and Difficult Training, Depending on Subject's Attitude Toward Equity vs. Equality (Figure Generated from the Results Reported by Bossong, 1983)

### *Own Contributions of Insurance Clients*

The system of risk insurance provides an ideal field for social justice research. The essence of risk insurance contains a prototypical application of the need principle. A group pays money into a common fund to protect individual members against financial risks with low expectancy but high value. In order to prevent misuse and keep the system efficient, the need principle is often combined with special versions of the equity principle: Insured individuals who do not claim money for a certain amount of time are sometimes rewarded by bonuses. Furthermore, insurance rates are often risk dependent, i.e., clients with higher risks pay more than those with lower risks. Finally, some insurance companies pay for some amount of the damage only, leaving a certain percentage of the burden to the client. For some insurances, e.g., property insurance, these principles are meant to prevent misuse. For other insurances, such as health and liability insurance, the idea is that these principles work as safeguards against "unnecessary" neediness. The underlying assumption is that the insured have some control regarding the insured good, for example their health, and that own contributions prevent carelessness. Obviously, this assumption is more correct in some cases than in others. It is therefore not surprising, that the principle of own contributions itself, the types of damage it is applied to, and the percentage of the costs that are burdened on clients are matters of controversial public debate.

Six different insurance cases were described to 80 students in a vignette study by Schmitt et al. (in press): two health insurance cases, two house insurance cases, a car liability insurance case, and a car comprehensive insurance case. Insurance cases were varied within subjects (repeated measurement). Subjects had to indicate for each case, on natural scales ranging from 0% to 100%, the percentage of the total costs that they would consider a fair contribution of the client. Based on internal consistency analyses, the suggested percentages for all eight scenarios were averaged (Alpha = .87). This average served as the dependent variable. Two situation factors were varied between subjects: (1) the client's Responsibility for the Damage (low, high) and (2) the client's Economic Situation (poor, wealthy). Subjects' Attitudes Toward Equity, Equality, and Need were measured with the same justice inventory that was described earlier (cf. Experiment 1).



*Figure 15*

### Mean Percentage of Own Contribution Assigned to Insurance Clients with High vs. Low Responsibility for their Damage (Adopted from Schmitt et al., in press)

According to the intrinsic rationale of the insurance system and the logic of own contributions, main effects for Responsibility and Economic Situation were predicted. These predictions were confirmed. More importantly for the present discussion, it was expected that a positive attitude toward equity would amplify the effect of Responsibility, while a positive attitude toward equality would lessen this effect. Furthermore, it was expected that a positive attitude toward need would amplify the effect of Economic Situation whereas a positive attitude toward equality would have the opposite moderator effect.

While the direction of the effects accorded to hypotheses for all of the predicted synergetic interactions, only the second effect (Equality x Responsibility) was strong enough to be statistically reliable [ $F(1, 74) = 12.21; p < .01$ ]. This effect accounted for 5% of the variance of the dependent variable. The fitted regression lines in Figure 15 are consistent with the corresponding results of Experiment 4 (cf. Figure 9) and Experiment 5 (cf. Figure 13). They show that with an increasingly positive attitude toward equality, subjects put less weight on information that would justify an unequal distribution. In the present case, this information refers to insureds' responsibility for their damage. Subjects with a negative attitude toward equality feel that it would be fair to have clients pay part of their damage depending on their responsibility, while subjects with a positive attitude feel that it would be unfair to treat responsible and nonresponsible clients differently.

## DISCUSSION

The research presented in this paper shows that the simultaneous consideration of functionally equivalent situation and person factors increases the accuracy of predicting allocation behavior and justice judgments. More specifically, attitudes toward allocation principles can operate under certain conditions as moderators of functionally equivalent situation factors: Subjects with a positive attitude toward equity were found to put more weight on input (achievement) differences than subjects with a negative attitude in two experiments (Herrmann & Winterhoff, 1980; Experiment 5 of the present research). Correspondingly, subjects with a positive attitude toward equality were found to disregard information that could justify an unequal distribution in five studies (Bossong, 1983; Herrmann & Winterhoff, 1980; Schmitt et al., in press; Experiments 4 and 5 of the present research). This general pattern supports the basic idea of interactionism and suggests that it may be worthwhile to implement the general interactionist framework more often in social justice research and in other fields of psychology than is presently the case.

Perhaps the more important result of the present research is that the predicted person-situation interaction effects were not significant several times despite sufficient statistical power and despite sufficiently reliable instruments for measuring attitudes. Interestingly, similar inconsistencies regarding person-situation interactions have been reported from other substantive domains as well. Anxiety and anger research is a first case. Spielberger's anxiety (1972) and anger (1988) theories imply the same synergetic assumption that was tested here. Anxious and anger-prone individuals are defined by a high sensitivity to threatening and frustrating situations, respectively. It is assumed that a constant increase in threat or frustration level leads to differential increases in emotion level depending on the subject's anxiety or anger proneness. Findings regarding this interaction have been remarkably inconsistent, however. Some studies have supported the synergetic premise, some have found no interaction, and some have even found opposite interaction effects (cf. reviews by Hank, 1995, and Schwenkmezger, 1985). A second example is Ruch's (1993, 1995) humor research. This author

assumes that trait cheerfulness moderates the effect of induced amusement. Individuals high in trait cheerfulness are considered to have a lower threshold for perceiving amusing information than individuals low in cheerfulness. Again, these assumptions imply a synergetic person-situation interaction. Although research on Ruch's theory is limited, the available evidence regarding the crucial interaction is inconsistent. A third and perhaps more general example is aptitude-treatment interaction (ATI) research. In his summary of ATI findings, Cronbach (1975) states that results were remarkably inconsistent between studies even if the same aptitude measures and the same treatments were used. Cronbach (1975) attributes the inconsistent pattern of results to unidentified moderators. According to this interpretation, scientific progress depends on the successful search for unknown interactions. The risk of this search is getting lost in a "hall of mirrors that extends to infinity" (Cronbach, 1975, p. 119).

Besides this risk, the accuracy-parsimony dilemma needs to be addressed when searching for additional moderators. Higher order interactions may lead to a better prediction of behavior but only at the cost of parsimony. This is the case because the number of parameters of a model increases rapidly with the order of interactions. Therefore, it seems desirable to concentrate on moderators that do not only operate in a specific domain but in multiple domains. Such general moderators have been proposed during the person-situation debate (Chaplin, 1991; Kenrick & Funder, 1988; Schmitt, 1990) and have been termed "metatraits" by Baumeister and Tice (1988). The metatrait which has received most attention during the consistency controversy is the individual's cross-situational consistency in behavior. It was first suggested by Bem and Allen (1974) and later explored in a large number of studies, recently, for instance, by Eysenck and Wild (1996).

During the person-situation debate, emphasis in searching for moderators was on personality variables. Yet characteristics of the situation may also operate as moderators (Diener & Larsen, 1984; Emmons & Diener, 1986;). The present research and results from research in other domains suggest that a promising general situational moderator ("metacharacteristic" of situations) may be the strength of the situation as defined formally by little interindividual differences in behavior (Mischel, 1973; Price & Bouffard, 1974). This moderator is general in the sense that it is not linked to a specific substantive explanation. The restriction of range in behavioral differences may stem from social norms, from demand characteristics of the situation, from physical constraints, or from obvious and severe consequences of behavior (e.g., most people would not help a stranger at the likely cost of their own lives). Whatever the psychological causes for the strength of a situation are, the general moderating effect is that the predictive power of any personality or attitude measure will decrease with increasing situation strength. Two studies from other fields may illustrate this mechanism.

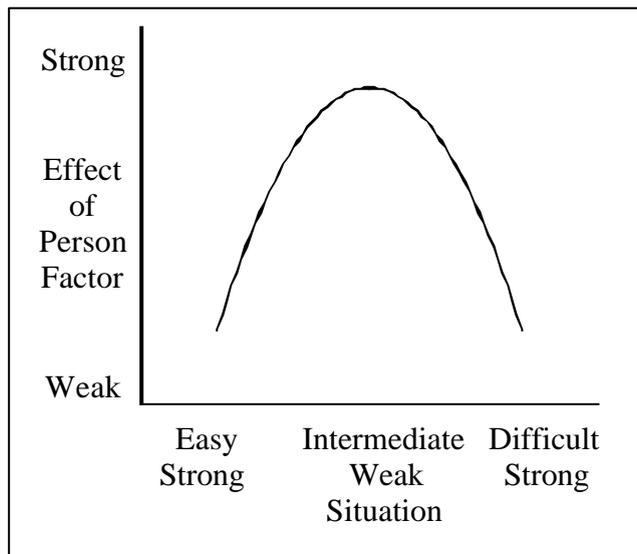
Dodge (1980) exposed aggressive and nonaggressive children to a peer who had acted either with a hostile, a benign, or an ambiguous intent toward the subject. Aggressive subjects displayed more aggression toward the peer than nonaggressive subjects only in the ambiguous situation. In the hostile and benign situations, the extent of aggressive behavior varied little between subjects, and a personality measure for aggression did not predict aggressive behavior. Hostile and benign situations were strong situations while the ambiguous situation was weak in the sense that aggressive behavior varied considerably between individuals.

Monson, Hesley, and Chernick (1982) exposed subjects varying in extraversion to three social settings. In the Forced-Extraversion Condition, two confederates facilitated extraverted behavior by actively including the subject in their conversation. In the Forced-Introversion Condition, the confederates facilitated introverted behavior by excluding the subject from their communication. In the Neutral Condition, confederates imposed as little constraints as possible on the subject's behavior. Sub-

jects' extraversion was rated by judges who listened to audiotapes of the interaction. The variance of this criterion was significantly lower in the two Forced Conditions than in the Neutral Condition. Consequently, the neutral situation was weaker than the two forced situations. Accordingly, the judges' ratings could be predicted better from self-reported extraversion in the Neutral Condition than in both Forced Conditions.

In psychometric terms (Nunnally, 1978), situation strength was related to situation difficulty in both studies. In Dodge's (1980) experiment, the hostile situation was easy and the benign situation was difficult regarding aggressive behavior, while the ambivalent situation had an intermediate difficulty level. In Monson et al.'s (1982) study, the forced-extraversion situation was easy for displaying extraverted behavior, the forced-introversion situation was difficult, and the neutral situation again had an intermediate level of difficulty. It is a psychometric truism that items with an intermediate difficulty level discriminate individuals better than easy and difficult items. Accordingly, behavior varies less between individuals in easy and difficult situations than in situations with an intermediate difficulty level. As a consequence, behavior can be predicted better from personality variables in functionally equivalent situations with an intermediate difficulty level than in functionally equivalent situations which are either easy or difficult. We may therefore consider situation difficulty as another general situation moderator whose moderating function is quadratic.

A quadratic functional relation can also be assumed between situation difficulty and situation strength. This function is in fact a mathematical implication for dichotomous behavioral measures (cf. Nunnally, 1978). However, if continuous behavioral measures are used, as in the present allocation experiments and in the studies by Dodge (1980) and Monson et al. (1982), the quadratic relation between situation strength and situation difficulty is probabilistic. In this case, situation strength and situation difficulty are no longer equivalent concepts. Situations can uniform behavior despite having an intermediate level of difficulty. In most cases, however, situation strength and situation difficulty will be confounded to some extent and we may therefore suggest one moderating function for both moderators (Figure 16).



**Figure 16**

Situation Difficulty and Strength as Moderators of Person Factors (Hypothetical Function)

The concepts of situation difficulty and situation strength have important implications for interactionist research. Depending on the combination of experimental situations that differ in difficulty or strength, different person-situation interactions will result. Consider the Monson et al. (1982) research as an example. Realizing only the neutral and the Forced-Introversion Conditions would have resulted in a synergetic person (extraversion)-situation interaction effect on extraverted behavior. The opposite interaction effect would have been found if the neutral and the Forced-Extraversion Conditions had been combined. In other words: The sign of a linear interaction effect (product term) depends on the combination of difficulty levels. More generally, a true synergetic person-situation interaction may be disguised (as was the case in the present Experiments 1, 2, and 3), amplified, or even reversed if situations differing in strength are compared. Accordingly, person-situation interactions may stem only from differences in strength between situations and not be due to a mutual amplification of functionally equivalent person and situation factors. Part of the remarkable inconsistencies in the results that have been obtained in interactionist research programs may originate from these mechanisms.

Asserting similar previous appeals (Magnusson, 1984; Pervin, 1978), the more general message from the present analysis is that we may need to invest more thought and care in the selection of experimental situations in social psychology. In order to illustrate what this means, it may be useful to consider the person side in the general interactionist framework. The psychometric equivalent to situation difficulty is trait level (cf. Nunnally, 1978). Easy situations are functionally equivalent to individuals with high trait levels, difficult situations are functionally equivalent to individuals with low trait levels. Accordingly, strong persons may be defined as persons with little intraindividual variation of behavior across situations, weak persons change behavior considerably across situations (Bem & Allen, 1974), perhaps due to extensive self-monitoring (Snyder, 1987). If we exposed a strong and a weak person to a number of situations that differ in evocativeness, an interaction would occur with a larger effect of the situation factor for the weak person than for the strong person. Since we usually take considerable pains for drawing representative samples and assigning individuals randomly to experimental conditions, however, it will rarely be the case that we compare groups of subjects which differ systematically in person strength.

Unfortunately, we usually take much less bother in considering the universe of situations to which our experimental situations belong. In addition, this universe is hypothetical in many cases and it is therefore practically impossible to draw a random sample of situations. Furthermore, the number of situations that we can compare in an experiment is limited for economic reasons. Nevertheless, it may be worthwhile and possible to consider carefully in many cases in what other facets experimental situations differ besides the ones that are of interest. In Experiments 1, 2, and 3 of the present research, the 2:1 and 1:2 Conditions differed in more aspects than relative achievement as the focal facet. The Winning Condition seems to have evoked a different set of cognitions regarding social expectations than the Losing Condition. This difference was irrelevant regarding the primary research question. More importantly, it counteracted the expected effect of the intended difference and thus disguised the predicted synergetic person-situation interaction. Similar processes may have operated in other studies and may be one reason why interactionist research programs have failed to yield a more consistent and conclusive pattern of results. It may be a worthwhile task to reanalyse available interactionist data sets from this point of view.

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