

Interactionism in Psychology and Education: A New Paradigm or a Source of Confusion?

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The nature of interactionism as manifested in psychology and education is examined. The author discusses the historical, conceptual, and methodological bases of interactionism, reviews pertinent research, and concludes that interactionism (person-by-situation study in personality psychology and ATI in educational study) is little more than the proclamation of a truism. Moreover, he argues, the focus on interactionism has contributed more confusion than clarity since the need for a better understanding of the person factor in the classical $B = f(P,S)$ has been obscured.

On examine la nature de l'interactionisme tel qu'il se manifeste en psychologie et en éducation. L'auteur discute les fondements historiques, conceptuels et méthodologiques de l'interactionisme, une recension des écrits qu'y s'y rattache et conclut que l'interactionisme (étude de la "personne en situation", dans la psychologie de la personnalité, dans l'ATI et dans l'étude de l'éducation) n'est pas beaucoup plus que l'affirmation d'un truisme. Il défend de plus le point de vue que l'accent mis sur l'interactionisme a contribué à créer plus de confusion que de clarté puisque le besoin de mieux comprendre le facteur de la personne dans la formule classique $B = f(P,S)$ a été négligé.

For several years now, some psychologists and educational researchers have been urging that scientists in these areas adopt an "interactional approach" in their investigations. Many have responded to the clarion call. Indeed, in the last decade or so, there has been a proliferation of studies and literature on the topic of interactionism. As the effort has intensified, some of the least cautious of these "interactionists" (e.g., Endler, 1973) have gone as far as claiming that interactionism constitutes a new paradigm of scientific endeavor in the Kuhnian sense (Kuhn, 1962). Others, though more cautious (McCann & Short, 1982, for example), nevertheless feel that interactionism represents an "important evolutionary step" (p. 114) in both psychology and education in general. Given these rather grandiose proclamations, one might very well inquire into the nature of interactionism. It is my intention to do so in this paper.

The idea of interactionism is neither new (e.g., see Ekhammar, 1974) nor, as I wish to show, particularly revealing. I contend that interactional research as it has been operationalized in both psychology and education represents little more than the proclamation of a truism rather than a "new paradigm" or an "important

evolutionary step." It is, essentially, a misplaced attempt to resolve some obdurate theoretical-conceptual problems a-theoretically. As a result, the emphasis on interactionism has brought more confusion than clarity. We can begin with a brief examination of the historical development of interactionism.

Historical Development

The idea of interactionism in the natural sciences can be traced back at least as far as Darwin's theory of evolution: Species interact with a particular ecology and selection occurs by consequences (Darwin, 1859). Those organisms best suited to that environment thrive and reproduce themselves while the not-so-well suited perish. In the social sciences, the concept of interactionism was made explicit by sociologists like Ward (1906), students of personality like Freud (1900) and Lewin (1935), as well as learning theorists like Watson (1914) and Skinner (1953, 1981). These theorists viewed human development and behavior as outcomes of a constant interplay between the individual and his environment. The concept of "modern" interactionism (Ekhammar, 1974), however, did not emerge until the latter half of this century.

Cronbach (1957) can correctly be said to have initiated the interest and research in modern interactionism. In his classic paper, "The Two Disciplines of Scientific Psychology," Cronbach contended that there have been essentially two dominant branches of scientific psychology with very different philosophical roots, conceptual bases, and methodological approaches: experimental psychology and psychometrics. The experimentalists focus on variance that can be attributed to differences due to treatments (i.e., environmental differences), while the psychometricians focus on variance due to individual differences among organisms (i.e., persons). The basic analytic strategy for the experimentalists is the analysis of variance (and related procedures), while psychometrics is based on correlational methods and their derivatives (e.g., regression analyses, factor analysis). It is interesting to note, as Meehl (1978) has pointed out, that the variance treated as error by one group of psychologists (experimentalists) is the very subject matter of the other group of psychologists (psychometricians). Because of the very different orientations, subject matter and investigative methods, it is rarely encouraged, or even possible, to incorporate principles, research methods and content in one area of scientific psychology from the other (Cronbach, 1957, 1975).

Interactionism has been seen as an attempt to incorporate features of both of these orientations into a more encompassing and inclusive paradigm (e.g., Cronbach & Snow, 1977; Endler, 1973, 1975; Endler & Magnusson, 1976a; McCann & Short, 1982; Mischel, 1979). Such ideas have infiltrated experimental psychology, industrial and organizational psychology, clinical psychology and other areas, but have had particular impact on educational psychology and personality psychology. Indeed, much of the impetus for adopting an interactional approach has come from a widespread feeling that personality psychology is in a state of crises (e.g., Berlyne, 1975; Feshbach, 1978; Mischel, 1968; Phares & Lamiell, 1977; Sechrest, 1976) as is educational psychology (e.g., Anderson, 1981; Travis, 1979, 1983). In personality psychology, interactionism has become known as person-by-situation

interaction, while in educational psychology, it has become known as Aptitude-by-Treatment Interaction (ATI).

Interactionism in Personality Psychology

In "scientific" circles, two major classes of personality models are generally recognized as the dominant influences on research. These are the psychodynamic and trait models. In the last few years, both of these models have come under severe criticism. Armed with the accumulation of extensive empirical research, the critics (e.g., Mischel, 1968, 1973a, 1973b; Vernon, 1964) have argued that assumptions (such as that of transsituational and transtemporal stability of personality dimensions) which are central and "fundamental to the concept of personality" (Feshbach, 1978, p. 44) have been seriously undermined. As a result, the status of the notion of personality is currently under debate and some even refer to it as a myth (e.g., see Feshbach, 1978; also Helson & Mitchell, 1978). Indeed, the whole area of personality assessment and research has fallen on hard times. Several authors have indicated that in employing its traditional orientation, personality psychology has reached its limits as "science" (Epstein, 1979, 1980; Fiske, 1974, 1978a, 1978b, 1979; Goldfried & Kent, 1972; Koch, 1981; Meehl, 1978; Sechrest, 1976).

This widespread dissatisfaction with the trait and psychodynamic models of personality assessment and research, has produced an upsurge of interest in the so-called interactional model of personality. Even Mischel, whose earlier writings were primarily devoted to criticizing the trait and psychodynamic positions (e.g., Mischel, 1968, 1973a), has recently come around to adopt an interactional position (e.g., Mischel, 1977, 1979). As Endler (1977) has suggested, interactionism "is probably the present *Zeitgeist* of research in personality" (p. 345).

The focus of the interactional model is the interaction between the individual and the environment. Actual behavior in this model is considered to be the result of an irreducible interaction between the person and the situation encountered. In many cases, other persons may form an integral part of the situation. This does not imply that persons and situations are unimportant sources of behavioral variance; rather, neither of these two factors alone determines behavior. The important element is the person-by-situation interaction unit.

The empirical evidence to support an interactionist view has come mainly from those researchers who have used the multidimensional variance component technique proposed by Endler (1966). This analysis-of-variance-based technique allows for the comparison of relative variance contributions by various factors. Endler and Hunt (1968) employed this type of analysis with respect to the variables of anxiousness and hostility and Endler and Magnusson (1977) have done this with respect to anxiousness. Typically, the variance components attributable to the person-situation interaction are larger than the variance components attributable to either persons or situations. Recent evidence of the same nature demonstrates the prepotence of the interaction unit: Cohen (1977) who studied the impact of traits and situational factors in the psychology of dreaming sleep; Rushton and Endler (1977) who examined academic achievement; Endler and

Magnusson (1977) who focussed on stress factors in an examination situation, as well as Wiesenthal, Endler and Geller (1973) and Endler, Coward and Wiesenthal (1975) who shared an interest in conforming behavior, all showed that the interaction unit accounts for more variance than either of the two main effects alone. Other areas of personality research which supports the interactional model of personality includes Fielder's (1974) work on leadership; Berkowitz's (1973) material on aggression; the literature on locus of control (e.g., Baron, Cowen, Garz & McDonald, 1974); some work on social isolation (e.g., Altman & Haythorn, 1967), as well as some other more indirect tests of interactionism. Despite this body of evidence which seems to support this notion that typically the person-situation variance is larger than either of the two main effects, there are serious shortcomings in the interactional approach as it stands today. These will be discussed below.

The trait model of personality (the psychometric branch of scientific psychology) is basically a response-response (R-R) theory which rests on the assumption that the determinants of behavior are personal qualities [$B = f(P)$] or that behavior is a function of person factors. Situationism (Bowers, 1973) is a stimulus-response (S-R) model (the experimental branch of scientific psychology), wherein, it is assumed that the primary determinants of behavior reside in the specific stimuli of the situation [$B = f(S)$]. The interactional model encompasses features of both of these; behavior is seen as resulting from both situation and person factors. While the shortcomings of the trait and psychodynamic models have been adequately demonstrated (e.g., Bowers, 1973; Mischel, 1968), little criticism has been leveled at the interactional model, perhaps because of its inherent logical appeal.

Four Species of Interactionism

Interactionism is frequently regarded as a singular viewpoint, theoretical position or model (e.g., Endler, 1977; Endler & Magnusson, 1976a). Several variants of this orientation, however, can be discerned in the literature on interactionism.

Buss (1977) for example, recognized the use of what he has described as two mutually contradictory definitions of interaction. The first represents a mechanistic world view while the second represents an organismic viewpoint — the two being derived from putatively incompatible metaphysical systems. These two models are derived from four distinct perspectives or viewpoints: (1) $B = f(S)$ (the simple situationist model); (2) $B = f(P)$ (the simple trait model); (3) $S = f(P)$ (the phenomenological position wherein the functional situation is assumed to be a cognitive construction); (4) $P = f(S)$ (behavior theory (e.g., Skinner, 1953) whereby the differences among people are assumed to stem from variation in their environmental histories). The mechanistic model combines the models $B = f(S)$ and $B = f(P)$ into the model $B = f(P,S)$ where the person and the situation co-determine behavior. Here the relation between P and S is not described but it is assumed that the relationship between (P,S) and B is unidirectional and causal. The organismic model combines the remaining positions [$S = f(P)$ and $P = f(S)$] yielding the reciprocally causal relationship, $S <---> P$.

Howard (1979) has criticized Buss' (1977) analysis on the basis that Buss has failed to specify two further models of interaction which are identifiable in the literature. Figure 1 represents the four basic models of interactionism that encompass all of the theoretical positions or viewpoints of interactionism.

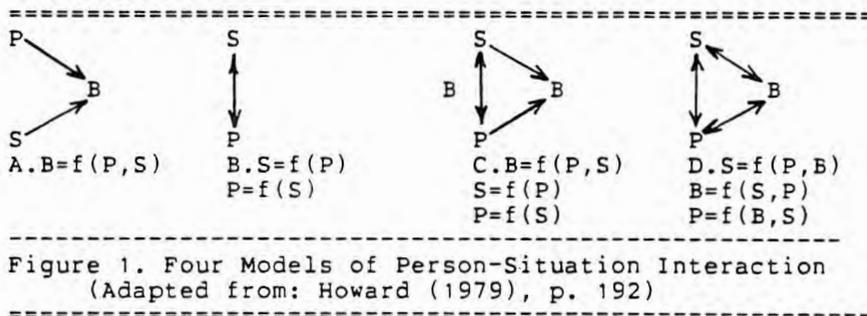


Figure 1A represents Buss' "mechanistic" model and Figure 1B represents his "organismic" model. Figures 1C and 1D explicitly express the assumption that mutual causation exists among all three variables (P,B,S) while Figures 1A and 1B represent the models of interactionism which do not explicitly take these mutual causations into account. The dialecticians who have debated the validity of interactionism have frequently failed to specify which model was being considered (e.g., Endler & Magnusson, 1976a). The various models have been tacitly treated as interchangeable, a practice which has led to considerable confusion and futile squabbling among the proponents of the various viewpoints.

Olweus' (1977) analysis of this point helps to clarify the shortcomings of the "modern" interactionist position. He also identified four separate meanings of interaction which can be related to the four models depicted in Figure 1. The first position, as represented by Endler (1973), is one of unidirectional interaction. Here it is a question of how two or more independent variables (person and situation variables) are "combined" or "connected" in their relationship to a dependent variable (individual behavior or reactions). This is the model represented in Figure 1A. The second interpretation of interactionism (represented by Bowers, 1973) focuses on the inseparability of the individual-environment system and emphasizes the interdependency between the person and environment. The person and environment are assumed to be interdependent insofar as the person perceives or construes the situation "in a fashion that makes it impossible ever to completely separate the environment from the person observing it" (Bowers 1973, p. 328). This is the interpretation of interaction as schematically represented in Figure 1B.

The third kind of interaction, reciprocal or dynamic interaction, is depicted in Figures 1C and 1D in its variant forms. Here the person and situation are seen as mutually influencing one another, resulting in specific behavior (Figure 1C). In

its second variant, the person and situation are seen as mutually influencing one another; resulting behavior affects the person's subsequent response, which in turn can transform the situation. This in turn again affects the person, which again influences the person's response, and so forth (Figure 1D). This position may be seen in some of Mischel's work (1977, 1979). The final interpretation or meaning of the term "interaction" is that represented by the "modern" interactionists (Ekehammar, 1974) and is a special case of Buss' "mechanistic" model in Figure 1A where $B = f(P,S)$. This meaning of interactionism is the conventional one as used in analysis of variance where two independent variables (person and situation variables in the interactionists' case) "combine" to contribute portions of the variance to the total pool of variation in the system. This strategy for "personality" research was initially proposed by Endler and Hunt (1966, p. 341) and has since been championed by Endler and his colleagues.

As in Olweus' (1977) first meaning, Buss' (1977) mechanistic model, and the model depicted in Figure 1A, this Endlerian version of interaction is of a unidirectional sort but with quite a special character in that it is based on an empirical method which is basically a-theoretical. Since most (if not all) the research on "interactionism" has been done within this restrictive, empirically based, a-theoretical method, and since it has been proposed as a useful method for resolving some central and persistent problems of personality research and assessment (Endler, 1973; Endler & Hunt, 1966) which are essentially of a theoretical-conceptual nature, this conception of interactionism receives special attention below. The more complex models of interactionism which explicitly posit mutual or reciprocal influence or determination between persons, situations and behavior, incorporate a remarkably abstract sense of causality and seem to lose track of what specifically is caused, influenced or determined, and what is constant through time. Accordingly, the conceptions of the triangular affairs represented by figures 1C and 1D do not move far beyond purely conceptual or metaphysical systems. That is, no research has been designed or generated within these models in attempts to specify the "f" or function, between persons and behavior, situations and behavior, and behavior and situations. Correspondingly, the terms "interactionism" or "interaction" in the following pages refer specifically to the Endlerian unidirectional, analysis of variance-based conception of interactionism.

Unidirectional Interaction

Endler (1973) has gone as far as assigning interactionism as manifested in personality research to new paradigmatic status. Many others before him, however, understood the importance of situations in personality research. Even Cattell (1965) for example, nearly a decade earlier, readily recognized the importance of situational stimuli, when he wrote "lack of allowance for the situation is one of the main causes of misjudging personality" (p. 27).

At the same time, Mischel (1973a) indicated that the language of interactionism simply provides another way of talking about the idiosyncratic organization of behavior and its dependence upon specific conditions. Before its proponents can

claim to provide a new direction for personality theory and research, interactionism must be predictive rather than merely descriptive. It must, on an *a priori* basis, predict moderator variables from classes of behavior or reactions that will be useful in analyzing behavior. The interaction studies that have been recently conducted, as Endler (1977) readily admitted, "do not tell us *why* [the variance is attributable to the interaction component]" (p. 352). Rather, they merely demonstrate that the interaction component accounts for more of the variance than either of the two main effects alone.

Furthermore, these studies have not as yet explained the nature of the obtained interactions between persons and situations and no one has demonstrated that accurate predictions can be made *a priori* about individual behavior. The attribution of the variance to the interaction component might lead one to conclude that the interactions have demonstrated consistent and predictable behaviors across a variety of situations. But this, of course, is not the case. The variance component studies are descriptive but not predictive. In the absence of an account of how interactions take place psychologically, "the emphasis on interactionism . . . [becomes] little more than the proclamation of a truism" (Mischel, 1973a, p. 257).

Clearly, the basic question of how the person and situation interact in determining behavior remains to be clarified and this is, after all, the question that Anastasi (1958) posed 30 years ago. As we have seen, in the unidirectional version of interaction, persons and situations are treated as independent entities that combine to produce behavior. Personal and environmental factors, however, do not function as independent determinants: The impact of each depends on that of the other. In addition, one can ask what in a person can be meaningfully said to be independent of that person's behavior? The consequences of present behavior can affect the situation in which one behaves, which will in turn, affect subsequent behavior. Thus person and environmental factors do not function as independent determinants of behavior. The modern interactionists (Endler, 1977) acknowledge that behavior is overdetermined and determinant, but persons and situations are depicted as independent causes of behavior as though behavior were only a product that does not figure in the causal process. Analyses which allow one to partial out the relative effects of a variety of factors are not possible within the "modern" version of interaction. Moreover, this model still flounders on the problem of distinguishing between the genotypic and phenotypic structures and dynamics of personality and of establishing the connections between the two. The modern interactionists (e.g., Endler, 1977) have relabeled the phenotypic as "reactive variables" and the genotypic as "mediating variables."

The Role of Reactive Variables

Endler (1977) has stressed the necessity for distinguishing between behavioral variables (typically conceived of as reactive variables) and mediating variables (the hypothetical construct). For example, heart rate is sometimes treated as a reactive variable which gives some indication about the levels of anxiety (the hypothetical construct). Endler stressed that there is not necessarily a one-to-one

relationship between the emitted behavior and the intrapsychic functioning at the hypothetical construct level. As we saw above, this is merely a restatement of the phenotypic-genotypic distinction made by Mischel (1968) and which has provided a conceptual trap for personality theorists.

MacCorquodale and Meehl (1948) made the distinction between intervening variables and hypothetical constructs 40 years ago. According to these writers, hypothetical constructs "involve the hypothesization of an *entity, process* or *event* which is not itself observed" while intervening variables are "constructs which do not involve such hypothesization" (p. 95-96). MacCorquodale and Meehl proposed three factors which characterize an intervening variable:

First, the statement of such a concept does not contain any words which are not reducible to . . . empirical laws. Second, the validity of the empirical laws is both necessary and sufficient for the 'correctness' of the statements about the concept. Third, the quantitative expression of the concept can be obtained without mediate inference by suitable groupings of terms in the quantitative empirical laws. (p. 107)

Hypothetical constructs on the other hand, do not fulfill any of these three conditions. Rather, their formulation

. . . involves words not wholly reducible to the words in the empirical laws; the validity of the empirical laws is not a sufficient condition for the truth of the concept, inasmuch as it contains surplus meaning; and the quantitative form of the concept is not obtainable simply by grouping empirical terms and functions. (p. 107)

In short, the proposed role on intervening variables was that of convenience since they were seen as not having any factual content surplus to the empirical functions that they serve to summarize. In the case of hypothetical constructs, however, they were seen as having a cognitive, factual reference in addition to the empirical data which constitute their support (MacCorquodale & Meehl, 1948, p. 107). Albeit often confused, this distinction between hypothetical constructs and intervening variables has formed the very foundation of the approach to personality study both within the psychodynamic and trait models as well as the more recent interactionist approach. The interactionist theorist, who like the trait theorist relegates observable behavior to the "reactive variable" status, faces problems.

Much of the research that has been done employing the interactional model has been in the study of anxiety (Endler, 1966; Endler & Hunt, 1966; Endler & Magnusson, 1977). In recent formulations about the nature of anxiety (Endler, 1977), two components have been distinguished — trait and state anxiety. Trait anxiety is conceptualized as a hypothetical construct which is thought to be a relatively stable personality characteristic and has at various times been conceptualized as a trait, as a motive, and as a drive (Shedlesky & Endler, 1974). State anxiety is also conceptualized as a hypothetical entity but it is considered to be a transitory emotional condition. Nevertheless, anxiety, whether trait or state, is viewed as a hypothetical entity within the person that orders, gives rise to or "causes" behavior. This emitted behavior is, at the same time, dependent (to some degree) on situational stimuli.

Anxiety has, in the past, been operationally defined with reference to diverse criteria and has consequently given rise to considerable confusion and imprecision in psychology. Sarbin (1968), one of the more incisive and radical critics of anxiety research, takes the position that since anxiety is typically used with reference to a mental state, it becomes ontologically mythical. That is, anxiety is merely a creation of the researcher rather than a component of the human "psyche," and as such, its nature and manifestation are not subject to verification or falsification through scientific inquiry. Sarbin goes on to suggest that inquiry must be steered away from hypothetically constructed states of mind which have been the source of much futile speculation. The modern interactionists, however, still rely on the "state-of-mind" approach which leads into the intractable and complex problem of discovering the relationships between hypothetical constructs and observable behaviors which are assumed to be the phenotypic expression of these underlying intrapsychic genotypic "mental states".

Speculations concerning these internal factors lead to a galaxy of "constructs," "traits" and "dispositions" for which there is little in the way of convincing evidence. Researchers "searching" for these "states-of-mind" have typically employed the strategy of construct validation.

The investigator using this approach, takes as the criterion, a particular behavior which is not intrinsically meaningful or of interest in its own right. Rather, he regards, on theoretical grounds, such "reactive variables" as "signs" or "test responses" for indexing some underlying trait, construct or disposition. Unfortunately, this search for an inner system via reactive variables, has, as Skinner (1975) put it, "proved to be one of the most fascinating attractions along the path of dalliance" (p. 43).

Fiske (1979, 1978, 1977, 1974) has argued that the difficulties in making connections between hypothetical constructs and self-report and other indirectly collected data have caused the conventional science of personality to reach its limits. Three interrelated conditions are considered to be responsible:

- 1) most of the data are the products of complex interpretive judgement processes within observers;
- 2) the agreement between sets of observations is limited; and
- 3) the ties between observation and concepts is limited.

In self-report data, the co-variation between specific items is low and reproducibility over occasions is poor (Meehl, 1978). In judgement by others, there appears to be little hope for improving the level of agreement when the task requires complex decision processes (Fiske, 1974). The interactionists still focus on concepts with inadequate specifications and tenuous linkages to measuring procedures. The severe limitations to progress in personality research is due to heavy reliance on words as explanatory devices and dependence on complex observer judgements arrived at by processing diverse perceptions with low agreement between observers. Accordingly, Fiske (1974) was moved to conclude that "As long as this traditional orientation to the field persists, little can be done to escape these fundamental handicaps" (p. 10).

Methodological Problems of Interactionism

Cartwright (1975) has argued that the S-R Inventory of Anxiousness developed by Endler, Hunt and Rosenstein (1962) and subsequently refined by Endler and Hunt (1966) and which has become the instrument of the champions of interactionism (Endler, 1977; Endler & Magnusson, 1977), inappropriately combines variance from situations and modes of response in the total variance pool against which the component of variance due to individual differences is evaluated. In the original study (Endler et al., 1962), the S-R Inventory showed test-retest reliability coefficients of 0.97 and 0.95, which indicates that 97% and 95% of the variance in this inventory is due to trait-like differences between individuals. The data analysis, however, suggested that only 5% of the variance was attributable to individual differences. This discrepancy, Cartwright (1975) suggested, arises depending upon whether the inventory is used as a test in the usual sense or is used as an experimental design. Clearly, depending upon which use the inventory is put to, different operations become appropriate leading to different results of analysis. In the experimental design, modes of responses contribute the largest amount of variance which is typically about 25%. Individuals however, respond *through* the modes of response and not *to* the modes of response so that significant effects for the modes can at most suggest that respondents have a common preference upon the modes of response. Although this preference might be of interest in its own right, such facts are not of interest in the experiment and should not be allowed to inflate the total pool of variation and give an erroneous impression of the size of treatment influences (Cartwright, 1975). Further, the word *anxious* is used in the Inventory to mean either anxiousness of anxiety or anxiousness of pleasurable anticipation so that two factors govern the modes of response. It should not be surprising, then, that these factors contribute the greatest variance. But Cartwright (1975) suggested that these components should not be allowed to contribute to the total variance against which other variance sources are evaluated.

The situations in the S-R Inventory vary widely on the degree of threat that they present and as Endler and Hunt (1966) noted, such a state of affairs leads to a spuriously inflated variance component due to situations. The range of situations with regard to the degree of threat should not be excessive by contrast with the range of subjects with regard to degree of anxiousness (Cartwright, 1975). Since the percentage of variance contributed by a factor is evaluated against the total amount of variance and the total becomes larger or smaller depending upon what separate contributions are added to it, the relative size of variance contributed by one source becomes larger or smaller correlatively. Cartwright (1975) experimentally made the situations more homogeneous and found that less variance was attributable to situations than to persons. He concluded that as an experimental design, the Inventory allows large quantities of variance from unjustified sources to enter into the total variance against which the individual differences component is evaluated.

Typically, the source-of-variance paradigms decompose a person (p) X situation (s) X mode of response (r) data matrix by standard analysis of variance procedures and the obtained mean squares are solved for all obtainable variance component estimates. Then all possible omega-squared (ω^2) ratios which purportedly assign the proportion of variance attributable to each component, are formed. Bowers' (1973) examination of the 11 studies involved the formation of three critically important ratios: σ_p^2/σ^2 Total (i.e. person variance), σ_s^2/σ^2 Total (i.e. situation variance) and σ_{ps}^2/σ^2 Total (person X situation variance). Golding (1975) has argued that the omega-squared ratios are inappropriate statistics to use in this kind of analysis for several reasons:

- 1) This statistic rests on the assumption that scores on measuring instruments have absolute value both in a measurement sense and a psychological sense; that is, it is assumed that the obtained value has meaning as an absolute quantity. Few psychologists would be prepared to make such an assumption about most psychological data.
- 2) The size of the obtained interactions are spuriously inflated because of various measurement artifacts and ceiling and floor effects whose influence is usually unknown.
- 3) The triple interaction in the typical paradigm is confounded with error variance which inflates σ^2_{ps} components and is not independently estimable.
- 4) Omega-squared ratios are subject to considerable variation as a function of the heterogeneity of the population of persons and situations sampled. Thus, the person component may be artificially inflated by sampling a more heterogeneous population of persons; the situation variance could be similarly inflated. It is conceivable that a very low estimate of person variance can be obtained by having very heterogeneous situations *even though persons may maintain perfect rank-over transsituational consistency on some measure*.
- 5) The theoretical importance of such interactions without reference to an empirical examination of their structure which has as yet not been done, can neither be asserted nor denied.

Bowers' (1973), and more recently, Endler's (1977) position that interactionism accounts for more variance is as untenable as Mischel's (1973a) position that the interactionist patterns are highly idiosyncratic. To assert the former, it is necessary to demonstrate that the obtained interactions can be meaningfully decomposed into replicable patterns (Golding, 1975). The latter position requires a demonstration that the obtained interactions are not systematic or patterned.

Golding (1975) suggested that the omega-squared ratios be replaced by generalizability coefficients which circumvent the shortcomings of the former statistic. Neither omega-squared ratios nor generalizability coefficients, however, can overcome the lack of a strong data base. Currently available data are too fragmentary, method specific, or confounded to make the kind of conclusions about interactionism that have been made by some (e.g., Endler, 1977; Endler & Magnusson, 1977). Most of the studies rely on self-report behavior in imagined situations (e.g. Endler & Hunt, 1966; Endler & Magnusson, 1977) or more

rarely, behavioral observations of questionable generality or importance. Moos (1969) for example, observed frequency of head nods, leg movement, scratching or smoking but these hardly represent behavior from which we might construct general theories of human behavior or personality.

A final problem inherent in the current interactionist model is the arbitrariness with which situations are defined. Bowers (1973) pointed out that it is common practice to reason that if individuals behave differently the situations were different, and if they behave similarly, the situations were not different. This circular reasoning does not provide for independently defined and calibrated individual differences and situational factors. Although Magnusson (1971) has made initial attempts at analyzing and describing the dimensionality of individual judgements of situations, the effort has met with little success. Accordingly, Endler (1977) suggested that:

We need to make predictions in studies in which we simultaneously examine various situational variables . . . [which] will enable us to investigate and predict the nature of person-by-situation interactions in effecting behavior. (p. 352)

This suggestion is commendable, but the interactional approach as it is currently applied will not yield such information. For as Golding (1975) has noted:

. . . the existence of interaction terms cannot be uncritically accepted as supportive of the interactionist view-point unless they are shown to be non-artifactual, replicable, and meaningfully patterned. (p. 287)

Summary of Criticisms of "Modern" Interactionism in Personality

By way of summary, "interactionism" as it is seen throughout the personality literature has been conceptualized in several different, sometimes incompatible ways. Most of the research within the interactional model is based on the Endlerian unidirectional, analysis-of-variance based conception which is essentially a-theoretical. The central question to be addressed is "how" do persons, situations and behavior interact to produce present and future behavior. The interactional model as operationalized within the source-of-variance paradigms *cannot* address this question (cf. Sadava, 1980). Within this model, persons are still defined with reference to hypothetical, highly abstract "constructs" and "traits" and behavior is viewed as providing "signs" or "tests" of underlying dispositions, traits or constructs. In addition, the question of the validity of what is being studied has been paid very little attention while the researchers have focussed on refining analytic techniques for data of questionable stability and validity (Fiske, 1979; Jackson & Paunonen, 1980; Lumsden, 1976; Rorer & Widiger, 1983; Tryon, 1979). In conclusion, the variance component technique has contributed more confusion than clarity. It is not possible to institute adequate tests of the trait, situationism and interactional positions by means of the analysis of variance component technique as it is commonly used (cf. Golding, 1975; Olweus, 1977).

Interactionism in Educational Psychology

ATI (Aptitude-by-Treatment Interactions) is the acronym of the interactionists in educational psychology. Like the interactionists in personality psychology, the

proponents of ATI wish to establish the variance-accounting capacities of the interactions of environmental and personological variables in the total pool of behavioral variance (in this case usually an educational outcome) (Cronbach & Snow, 1977; McCann & Short, 1982; Snow, 1976). An aptitude is defined as

“... any characteristic of a person that forecasts his probability of success under a given treatment . . . [It is] Any aspect of the individual, including some matters untouched by conventional ability and personality measures . . .” (Cronbach & Snow, 1977, p. 6).¹

Meanwhile, a treatment “. . . covers any manipulable variable . . .” Even when a variable cannot be manipulated (e.g. teacher’s sex), but “the students’ experience can be manipulated by an assignment policy,” it is regarded as a treatment (Cronbach & Snow, 1977, p. 6). A treatment, then, is the independent variable in a true experiment or quasi-experiment (Campbell & Stanley, 1963) while aptitudes are personological variables which cannot be manipulated.

Evidently, then, ATI is really another name for the notion of person-by-situation interaction in personality research. Perhaps ATI research may be regarded as a sub-set of interactionism in personality since the environment of interest typically is the classroom or the school (Hunt, 1975), while in personality research, “environment” may refer to any environment whatsoever - physical, social, psychological and cultural (Feshbach, 1978; Magnusson, 1971). Aptitude, however, has just as broad a definition as personality though ATI studies frequently focus on abilities variables as the person-variable of relevance (Snow, 1976). The A in ATI simply means “person” in the person-by-situation formulation, while T refers to a sub-set of situations in this formulation.

The same criticisms that apply to interactionism in personality psychology, therefore, apply to ATI in instructional psychology and education. First, ATI research, as interactional personality research, suffers from a general lack of theory (Shapiro, 1975). The *methods* (analysis of variance, regression analysis) are given precedence over theoretical formulations. Cronbach and Snow (1977), having recognized this problem, have called for more sophistication in the generation of hypotheses. Second, ATI researchers face the same fundamental problem as personality researchers of providing an adequate and valid specification of the person (aptitude in ATI) in the classical $B = f(P,S)$ equation since we have not a good understanding of this fundamental unit (e.g., Fiske, 1979, 1974; Mischel, 1968; Violato, Travis & White, 1987). Third, the manner in which the environment (or situation or treatment) is to be conceptualized and measured remains a colossal stumbling block. Aside from the usual conundrum (“Should the actual or perceived environment be measured?”) the fundamental problem remains of how and what aspects of the environment are to be measured. Though some are wishfully suggesting that a psychometric approach is necessary (e.g., McCann & Short, 1982), a few abortive attempts in this direction have not proved promising (Steele, House & Kerins, 1971; Trickett & Moos, 1973). In the absence of meaningfully conceptualized and adequately measured environmental (situational) characteristics, an interactionist approach is of little use. Fourth, higher-order interactions almost always accompany second-order interactions (Cronbach, 1975;

Cronbach & Snow, 1977; Solomon, 1972; Snow, 1977) and these impinge on the second-order interactions and their interpretations. Higher-order interactions alter the interpretation of second-order interactions just as the latter alters the interpretation of significant main effects. Thus, interpretations of interactions without a knowledge or acknowledgement of higher-order interactions may render their interpretations incorrect.

In addition to these shared problems, ATI research enjoys problems that appear to be uniquely its own. Much of the impetus or *raison d'être* for ATI research is the development of a general theory of instruction (Snow, 1977). Scandura (1978) and Merrill (1975), have convincingly argued that ATI research is a poor basis upon which to attempt to develop a general theory of instruction. Snow (1977) has argued that because of the prevalence of higher-order interactions and the problems these pose, it is impossible to attain a general theory of instruction through ATI research. In reviewing these works, Ragsdale (1980) summed up the state of affairs succinctly: "ATI's may be hard to find, apply to a few people in rare settings, be unstable over time, and be irrelevant to instruction" (p. 48). There seems to be very little (if anything at all) to recommend ATI research in particular and interactionism in general.

Conclusion

The focus on interactionism has led to more confusion than clarity. At the same time, the need to measure adequately and assess the person factor in the classical $B = f(P, S)$ formulation has been obfuscated. The bulk of data to date indicate that individuals do not demonstrate either transtemporal or transsituational consistency in behavior (Epstein, 1980; Lamiell, 1981; Mischel, 1968; Mischel & Peake, 1982; Rorer & Widiger, 1983; Travis & Violato, 1982), a fact which has given rise to the consistency-specificity issue. The resolution of this issue remains a central goal and challenge to those who study personality. Indeed, this issue is so central and fundamental to the whole notion of personality and its assessment, that progress in gaining understanding of personality development and dynamics has been stymied by this vexing problem. This is essentially a theoretical-conceptual problem as well as a methodological one (Fiske, 1979; Mischel, 1979; Mischel & Peake, 1982; Violato, 1982; Travis & Violato, 1982). The focus on an a-theoretical interactionism, however, has obscured this problem and has given rise to much pointless squabbling. We need not a useless iteration of the virtues of interactionism, but some significant thought given to the nature of persons and how they are to be measured. In the absence of such efforts, the focus on interactionism merely creates more confusion than clarity and leads to the expenditure of energy in fruitless debate.

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