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The Act Frequency Approach to Personality

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The act frequency approach to personality is advanced in this article. Dispositions are viewed as summaries of act frequencies that, in themselves, possess no explanatory status. As sociocultural emergents, dispositions function as natural cognitive categories with acts as members. Category boundaries are fuzzy, and acts within each category differ in their prototypicality of membership. A series of studies focusing on indices of act trends and on a comparative analysis of the internal structure of dispositions illustrates this basic formulation. The act frequency approach is then placed within a taxonomic framework of the relations among act categories (horizontal dimension) and hierarchic classification (vertical dimension). Theoretical implications of the act frequency approach are examined. Dispositional consistency is distinguished from behavioral consistency and several act frequency indices (e.g., dispositional versatility, situational scope) are defined. Situational analysis and personality coherence are then viewed from the act frequency perspective. Discussion focuses on the possible origins and development of dispositional categories and implications of alternative middle-level constructs for act categorization and personality theory.

The concept of disposition has occupied a central place in personality theory and research. Most major efforts have been directed at determining the external relations among dispositions (Cattell, 1957; Eysenck, 1953; Leary, 1957; Wiggins, 1979). In contrast, the internal structure of dispositions has received remarkably little theoretical treatment. At the Ninth International Congress of Psychology in 1929, Allport (1931) addressed the

question: What is a trait? On returning to that basic question 35 years later, Allport (1966) found that no extensive literature of close conceptual analysis of the concept of trait or disposition existed.

Once Allport's own early considerations of the concept of disposition (Allport, 1921, 1927, 1931; Allport & Allport, 1921) had culminated in his classic volume (Allport, 1937), the field of personality appears to have set its theoretical gears into neutral and to have coasted with his formulation. During the decades since the 1930s, important philosophical analyses of the concept of disposition appeared (Hampshire, 1953; Ryle, 1949) that might have sparked renewed conceptual discourse, but they failed to do so at the time. In a recent compelling advocacy, Maddi (1980) has argued for the advantages of vigorous theorizing for the field of personality. In that spirit, an act frequency analysis of dispositions is advanced here, and its implications for an approach to personality are reviewed.

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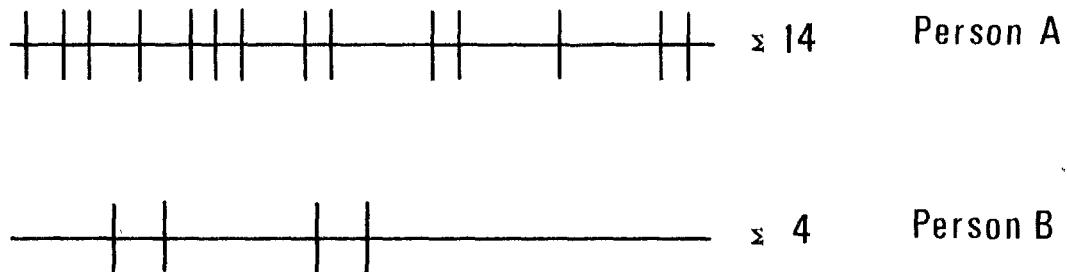


Figure 1. Dominant acts over 1-week period of monitoring.

The Act Frequency Approach: Basic Orientation

Dispositional Assertions as Summarizing Statements

Hampshire (1953) asserts that dispositional attributions function to summarize the trend of someone's behavior, thoughts, and feelings. In saying that a person is generous, Hampshire claims that "the word 'generous' is so far the right word to summarize the general trend or tendency of his conduct and calculations" (p. 35). To warrant the claim, one must engage in prolonged and continuous study of an individual's conduct. Actual incidents, dispersed over time, must be manifested. Lapses are possible; to attribute a disposition to someone is not to preclude that he or she may on some occasion have acted uncharacteristically (Brandt, 1970; Powell, 1959). When someone's disposition is in dispute, "the final and conclusive argument must be a balancing of one set of actual incidents against another set of actual incidents" (Hampshire, 1953, p. 35).

Dispositional assertions are summary statements about behavior up to the present; they are not predictions, although they carry "the normal implications that [the individual's] character is so far continuing the same" (Hampshire, 1953, p. 39). Dispositional assertions, in this view, serve descriptive and forecasting functions, but they do not deal with causal properties nor provide a causal account of the behavior at issue.

With various modifications and extensions, this philosophical analysis of dispositional assertions has guided the development of an act frequency conception of disposition that can be offered as an approach to personality research.

The Frequency Concept of Disposition

The frequency analysis of dispositional constructs focuses on specifying the relative incidence of acts within circumscribed categories or domains (Buss & Craik, 1980, 1981). From a frequency perspective, the statement "Mary is arrogant" means that, over a period of observation, she has displayed a high frequency of arrogant acts, relative to a norm for that category of acts. Acts within a given category may be topographically dissimilar, but they are still considered to be manifestations of a given disposition. To say that Mary is arrogant one must be able to marshal evidence of her manifestations drawn from the category of arrogant acts over a delimited period of observation. Act frequency tallies from dispositional categories provide not only summary interpretations of past conduct but also, on actuarial grounds, a basis for predicting future trends in behavior.

Within this approach, the fundamental measure of an individual's disposition is a multiple-act composite index, provided by frequency summary across a specified period of observation. It follows that in predicting future standing regarding a disposition, the appropriate criterion measure is also a multiple-act composite index, based on the frequency tally for the period of observation about which the prediction is made. *Act trends*, operationalized as multiple-act composite indices, become fundamental units of analysis in personality research.

A paradigmatic assessment is illustrated in Figure 1. Persons A and B have been tracked and their conduct has been monitored over a 1-week period of observation. The entries indicate the occurrence of dominant acts.

The act frequency approach would assess Person A as more dominant than Person B, based upon the tally of observed dominant acts and, on actuarial grounds, would forecast a continued higher base rate of dominance for Person A over Person B.

Temporal Reliability and Prediction

The act frequency approach incorporates several previous recognitions in psychological research. First, the notion that composite indices based upon multiple observations are more reliable than single observations is not new. It is the basis for the Spearman-Brown formula (Wiggins, 1981) and is widely used in scale construction (see Wiggins, 1973) and observer ratings (e.g., Block, 1961; Horowitz, Inouye, & Siegelman, 1979). More recently, the use of multiple criteria has been advocated for attitude measurement (Fishbein & Ajzen, 1974) and, by extension, for personality measurement (Jaccard, 1974). Also, Epstein (1979, 1980) has argued that impressive stability can be demonstrated over a wide range of behavioral variables as long as the behavior is averaged over a sufficient number of occurrences.

Because an individual's acts are necessarily dispersed over time, the use of aggregation in composite-act indices specifically addresses the issue of temporal reliability. In his studies on the stability of behavior, Epstein (1979, 1980) has demonstrated impressive levels of temporal reliability for even brief periods of observation (12–14 days). In the assessment of act trends within the frequency approach, this reliability yielded by composite indices is afforded to both predictor and criterion indices. The use of composite multiple-act indices is not simply a matter of measurement convenience in the act frequency approach to personality. Rather, it is at the heart of its formulation of dispositional constructs. The summary approach and multiple-act indices are intrinsically related conceptually. Temporal stability of personality dispositions is therefore directly and generally linked to construct validity.

In summary, the act frequency approach asserts that, for a given disposition, an *act trend*, or composite multiple-act index, constitutes an appropriate basis for predicting

Table 1
Dispositions and Explanations

Element	Glass	Person
Dispositional construct	brittleness	dominance
Manifestation of the disposition	shattering	taking charge after the accident
Causal account	molecular structure	genes, roles

future act trends or multiple-act indices. The measurement operations and statistical analyses for this fundamental kind of prediction in personality fall within the domain of temporal reliability. This approach to personality prediction acknowledges that the reliability offered by composite indices is necessary for both predictor and criterion variables, if prediction is to be conceptually appropriate and successful. In this basic form of personality prediction from observed act trends to future acts trends, full symmetry, except for temporal locus, holds for the predictor and criterion variables.

Act Frequency Approach and Explanation

A critical question in personality psychology pertains to the status of dispositions as causal or explanatory accounts. Recent philosophical treatments of this issue center on the relations among three elements: (a) the disposition, (b) manifestations of the disposition, and (c) a causal account of the manifestations (see Table 1).

The first issue is the relationship between the disposition and its manifestations. Addis (1981), Hampshire (1953), O'Shaughnessy (1970), Squires (1968, 1970), and others argue that a dispositional statement does not offer a causal explanation of its manifestations. Saying that an individual is dominant does not explain the acts of taking charge after the accident, deciding which movie the group will attend, or commanding someone to leave the room. The manifestations must instead be explained on independent grounds and not with recourse to the dispositional statement itself. This position contrasts markedly with any use of dispositional state-

ments to explain or account for observed manifestations (e.g., "She issued the command *because* she is dominant").

A related issue bears directly upon the relationship between dispositional statements and causal accounts. In differing ways, Armstrong (1969) and Cummins (1974) identify the disposition with its causal account (e.g., "brittleness is a sort of bonding of molecules"). In contrast, O'Shaughnessey (1970) argues that whereas dispositions may be associated with causal explanations in some poorly understood fashion, there is no causal role for the disposition itself ("it simply falls outside the causal schema"). Dispositional constructs, in this view, perform a job different from that of explanations.

By acknowledging the "powerlessness of dispositions" in explanation (O'Shaughnessey, 1970), the act frequency approach separates two distinct scientific endeavors: (a) mapping regularities in conduct, and (b) providing causal or explanatory accounts of them. Once regularities in behavior are identified, the usefulness of concepts drawn from genetics and biology (e.g., Buss, 1983; Eysenck, 1981), role theory (e.g., Sarbin & Allen, 1968), motivational theory (e.g., McClelland, 1983), functional analysis (e.g., Skinner, 1938), interactional analysis (e.g., Magnusson & Endler, 1977), and other explanatory schemes must be determined. Prior to such determination, however, the act frequency approach to personality dispositions provides, an actuarial grounds, useful predictions about future trends in conduct and identifies regularities of act patterns that call for explanatory accounts.

Dispositions as Natural Cognitive Categories of Acts

The frequency concept of disposition treats acts as basic units of analysis and seeks to specify the nature of dispositional categories that encompass these acts. The view of dispositions as summary statements carries the implication of multiple-act categories. That is, dispositional assertions summarize topographically dissimilar manifestations across a variety of situations (Buss & Craik, 1980, 1981, in press; Craik, 1976; Fishbein, 1972; Jaccard, 1974; Wiggins, Note 1). The cog-

nitive form of dispositional categories, their criteria for membership, and their structure pose important and heretofore relatively unexamined issues in personality theory.

Four different facets of dispositional categories may be examined. The first pertains to the internal category structure—a facet that has received almost no attention in personality research. Examination of the internal category structure raises important questions about category boundaries, internal relationships among category members, the differing conceptual status of category members, and so on. The second facet deals with the comparative analysis of dispositions in terms of their internal and manifested structures.

The third facet of the dispositional category structure involves examining the external relationships among dispositional categories that are posited to reside at the same level in a given taxonomic scheme. In the context of the act frequency approach, this second issue yields questions such as (a) What are the empirical relationships between frequency summaries of dispositional categories such as dominance and gregariousness? (b) Can a taxonomic model be applied to describe these external category relationships?

The fourth facet of the dispositional categories entails what Rosch (1978) and others have called the vertical level of categorization. Analysis of dispositions along the vertical dimension involves examining the relations between superordinate dispositional categories (e.g., the rubric of interpersonal traits), middle-level dispositional categories (e.g., dominance, gregariousness), and subordinate categories (e.g., specific acts). Because the internal category structure has been the most neglected in personality research, and because the act frequency approach affords a novel contribution at this level, it will be considered first and in the greatest detail.

Internal Category Structure

Acts are to the behavioral world what objects are to the inanimate world: basic constituent elements. Dispositional constructs offer a fundamental system for the categorization of acts. Dispositional constructs can

be analyzed as natural cognitive categories (Rosch, 1975a, 1978; Rosch & Mervis, 1975) or fuzzy sets (Zadeh, Fu, Tanaka, & Shimura, 1975) in that act categories for specific dispositions are assumed to be cognitively structured around prototype or central members, with nonprototype members becoming progressively more peripheral to the category. At the borders, the array of peripheral acts for a given dispositional category blends into adjacent act categories.

Conjoining the summary view of personality dispositions with the cognitive analysis of natural categories generates a program of personality research. Thus far, the acts subsumed within six interpersonal dispositions (agreeable, aloof, dominant, gregarious, quarrelsome, and submissive) have been explored and their internal structure examined (Buss & Craik, 1980, 1981; Buss, 1981a). The procedure used entails two steps: act nominations and prototypicality ratings.

Procedures

Act nominations. For each of the six dispositional constructs, undergraduates were asked to nominate acts that would count as manifestations of the disposition. The basic instructional set (e.g., for dominance) was "Think of the three most dominant females [males] you know. With these individuals in mind, write down five acts or behaviors they have performed that reflect or exemplify their dominance." The instructions were then repeated, with sex of actor altered. The aim of this procedure was to secure for each disposition 100 acts that could reasonably be considered to fall somewhere within the dispositional act category.

Systematic analysis of this act-nomination procedure has not yet been undertaken but is warranted. Despite the aim of the procedure and its instructions, many of the nominations did not constitute reports of occurrences, in Ryle's term (1949), or accounts of episodes (e.g., "issued orders to the group") that had happened. Some of the nominations were phrased in general terms (e.g., "gives out orders") and often included a frequency term (e.g., "constantly, forever, sometimes, rarely, never") in the act description (e.g., "always issuing orders"). Nominations of this kind can be readily converted to occurrence

statements. A substantial portion of the nominations, however, missed the point of the instructions and offered nonact terms, often in the form of trait adjectives (e.g., regarding dominance: "argumentative, talkative, stubborn"). The central focus of the instructions upon specific persons may have shifted the psychological set. Variations in instructions and provision of examples offer a basis for systematic examination of the act-nomination procedure.

For the purposes of the initial series of empirical studies, the lists of acts generated for each disposition were subsequently reduced by eliminating redundancies, nonact statements, general tendency statements, frequency statements, and statements that were considered too vague to constitute an observable act. Grammatical errors were corrected, and each selected act statement was phrased in a way suitable for performance by either sex. A list of 100 acts was derived for each dispositional construct in this way. In the case of aloofness, 11 acts generated from an expert panel were used to supplement the 89 acts generated by the undergraduate panels. Apparently, acts of aloofness are less readily summoned up than are acts for the categories of dominance, gregariousness, submissiveness, quarrelsomeness, or agreeableness.

Prototypicality ratings. For each of the six act lists, panels of judges rated the prototypicality of each of the 100 acts for the dispositional construct at issue. Instructions included this adaptation from the Rosch and Mervis (1975) procedure for judging the prototypicality of colors:

Close your eyes and imagine a true red. Now imagine an orangish red . . . imagine a purple-red. Although you might still name the orange-red or the purple-red with the term *red*, they are not as good examples of red (as clear cases of what *red* refers to) as the clear "true" red. In short, some reds are redder than others.

Judges then rated on a 7-point scale how good an example each act was of the dispositional category at issue.

The alpha reliabilities of the composite prototypicality ratings and the average between-rater agreements (panel size in parentheses) are as follows: agreeable, .77, .12 (31); aloof, .97, .42 (45); dominant, .95, .20 (79); gregarious, .95, .31 (42); quarrelsome,

.95, .44 (.29); and submissive, .96, .36 (.47). Except for agreeable, these indices are high, indicating that each rating panel displayed adequate composite reliability in judging which acts were more or less prototypical of the dispositional category, even within sets of acts independently nominated as falling within each category.

The ranked listing of acts on prototypicality was partitioned into quartiles, each successive 25 acts forming an independently composed multiple-act index (from Proto 1, the most central acts, to Proto 4, the most peripheral acts). Table 2 presents illustrative acts from each multiple-act index for the six dispositions under study.

Prototypicality ratings afford a convenient

and relatively direct means of examining category structure. However, the assumption that dispositional constructs function through natural categories of acts would be strengthened by convergent evidence from other typicality indices. In the domain of concrete objects, convergent findings have been demonstrated for prototypicality ratings, verification times for category membership, probability of item output in membership-nomination tasks, and expectations generated by the category name (Rosch, Simpson, & Miller, 1976). Similar examination of alternative typicality indices should be undertaken for dispositional categories.

The composite reliabilities of prototypicality ratings for act-disposition judgments

Table 2
Acts of Varying Prototypicality for Six Dispositional Constructs

Dispositional construct	Act
Agreeableness	
Proto 1	I readily did the dishes after dinner.
Proto 2	I forgave my acquaintance after she had spread a false rumor about me.
Proto 3	I picked up the tab for lunch.
Proto 4	I arrived on time for the meeting.
Aloofness	
Proto 1	I offered a monosyllabic response to the conversational overture.
Proto 2	While the others chatted, I gazed into the fireplace.
Proto 3	I declined the invitation to the large party.
Proto 4	I visited a museum alone.
Dominance	
Proto 1	I forbade her to leave the room.
Proto 2	I gave advice, although none was requested.
Proto 3	I resisted conceding an argument.
Proto 4	I walked ahead of everybody else.
Gregariousness	
Proto 1	I introduced myself to new coworkers without hesitation.
Proto 2	I told a joke at the dinner party.
Proto 3	I studied with a group to prepare for the examination.
Proto 4	I went to the football game.
Quarrelsomeness	
Proto 1	I picked a fight with the stranger at the party.
Proto 2	I ended the conversation by stalking out of the room.
Proto 3	I complained about having to do him a favor.
Proto 4	I insisted upon doing the driving on the trip.
Submissiveness	
Proto 1	I walked out of the store knowing that I had been shortchanged.
Proto 2	I continued to apologize for the minor mistake.
Proto 3	I let my partner choose which movie we would see.
Proto 4	When the three of us set out on the journey, I took the back seat of the car.

Note. Proto 1 = most prototypical; Proto 4 = least prototypical.

are substantial and adequate for the act frequency research. It is less clear what minimal level of between-rater agreement is required to justify application of the concept of natural cognitive categories to a judgment domain. For concrete object categories (e.g., bird, vehicle, vegetable, clothing), Rosch (1975b) reports split-half reliabilities of .97 or higher for a panel of 201 judges, which are comparable to those obtained for the dispositional categories. However, Rosch does not cite average between-rater agreement, which may be higher for concrete object categories than for dispositional categories (which ranged from .12 to .44). Systematic comparison of between-rater agreement levels for the categories of objects and acts is needed.

Within the act frequency approach, dispositional constructs are treated as sociocultural products held by members of a culture. Panels offer a direct means of seeking act specifications for dispositional categories, with individual misinterpretations, transient errors, and other variations presumably canceling each other out. Thus, reliability estimates for composite indices are appropriate theoretically and, with the possible exception of agreeableness, reach sufficient levels to pursue a research program in a manageable fashion (e.g., with panels of 20 or so judges).

Comparative Analysis of the Internal Structure of Personality Dispositions

The present framework provides two kinds of structural comparisons among personality dispositions. The procedures of act nomination and prototypicality rating suggest potentially useful attributes for comparing the internal cognitive structures of dispositional concepts. Additional and quite distinct comparisons among dispositions in terms of their manifested structures can be generated from the analysis of overt act performance, derived from self- or observer-based field monitorings.

The internal structures of dispositional categories can be compared according to their category volume, the composite reliability of prototypicality ratings, and the range and central tendency of prototypicality ratings for act members of a category.

First, the difficulty in soliciting 100 acts of aloofness from undergraduate panels (11 acts had to be derived from expert panel nominations) suggests that the volume of acts cognitively available for specific dispositional categories may vary. More systematic act nomination procedures can provide useful probes concerning the variation among dispositions in category volume. For example, examining the number of acts nominated per unit of time would provide an index of relative differences among dispositions in category volume. The main implication is that the total act membership of each dispositional category can be estimated, with an actual size and specifiable distribution along the prototypicality continuum.

Category volume may be related to Hampson's (1982) notion of the imaginability of trait categories, that is, to how easy it is "to imagine a behavior that would be described specifically" by the trait term (p. 5). The generation of instances of traits rated high on imaginability (e.g., helpful, clumsy) was found by Hampson to be more subjectively difficult than for traits rated low (e.g., important, sincere). Behavioral instances nominated for highly imaginable traits were also judged to be more prototypical than those for less imaginable traits.

A second comparative attribute is the reliability of prototypicality ratings. For example, the composite reliability for ratings of agreeable acts is somewhat lower than for our other five categories. Agreeable acts may not vary along the prototypicality continuum as much as acts in other dispositional categories. This restriction of range would make differentiation among agreeable acts difficult for judges, thus reducing composite reliability. The findings in Table 3 support this suggestion: The variance in the mean prototypicality ratings for agreeable acts is lower than for those in the other five categories. Examination of the prototypicality ratings for the 100 agreeable acts shows that they are concentrated within the middle range, with neither extremely central nor extremely peripheral acts appearing. Whether this distribution characterizes the actual category of agreeable acts or merely represents an artifact of our nomination and selection procedure will require more systematic examination.

Table 3

Comparative Analysis of the Internal Structure of Dispositional Categories

Category	Prototypicality ratings				Assessed act performance		
	Reliability		<i>M</i>	<i>SD</i>	Base rate (%)	Manifested structure	
	Alpha	Between rater				Alpha	Interact <i>r</i>
Agreeableness	.77	.12	4.62	0.58	79	.93	.12
Aloofness	.97	.42	3.38	1.22	53	.89	.07
Dominance	.95	.20	4.03	0.78	66	.94	.14
Gregariousness	.95	.31	3.96	0.99	67	.93	.12
Quarrelsomeness	.95	.44	4.07	1.24	41	.93	.13
Submissiveness	.96	.36	4.25	1.02	48	.91	.09

Note. Each category includes 100 acts. *M* = prototypicality ratings across the 100 acts; *SD* = standard deviations of the means across the 100 acts; and base rates = average percentage across the 100 acts within each category of those individuals reporting act performance.

Third, in addition to range, the central tendency of the distribution of acts on the prototypicality continuum may vary from disposition to disposition. As shown in Table 3, the mean prototypicality ratings for each of the six sets of 100 acts show the highest mean prototypicality for agreeable acts and the lowest for aloof acts. The interesting question is whether the disposition of aloofness is accurately characterized as relatively lacking in core acts or whether this result is a deficiency of our current act-nomination and rating procedures.

Systematic monitoring of individuals' conduct in everyday settings over standard periods of observation will eventually provide a basis for analyzing the manifested structure of dispositions and for making comparisons between them. For a preliminary examination of the issues encountered in these analyses, the 100 acts for each disposition under study were rephrased as first-person statements that yielded six act reports, one for each dispositional construct (i.e., agreeableness, aloofness, dominance, gregariousness, quarrelsomeness, and submissiveness). A sample of 100 university students completed the act reports, providing a dichotomous (yes/no) report for each act and, for those they had performed, a frequency rating (rarely, sometimes, often).

Despite the retrospective self-report nature of the act reports, findings from the reports serve to illustrate two ways of comparing dispositions that are based upon the assessed

performance of acts, in contrast to the analysis of the internal cognitive structures. These features of dispositional categories are base rates of occurrence and tightness of manifested structure.

Using the present method of self-reported assessment of act performance, base rates averaged across the 100 acts within each category yielded a range from 41% for quarrelsomeness to 79% for agreeableness, with submissiveness (48%), aloofness (53%), dominance (66%), and gregariousness (67%) falling in between. If confirmed by converging methods of assessing act performance, these differences in category base rates provide a central, but as yet relatively unexamined, issue for personality theory and actuarial prediction.

Finally, dispositions may vary in the tightness of their *manifested structure*, gauged by the empirical intercorrelations of acts within each category. An extremely tight empirical structure (very high correlations among acts) may suggest an undifferentiated style of conduct; a looser structure indicates a potential for differentiating styles in manifesting a disposition. In the present studies, the alpha coefficients and the mean between-act correlations for the six act reports were as follows: agreeableness, .93, .12; aloofness, .89, .07; dominance, .94, .14; gregariousness, .93, .12; quarrelsomeness, .93, .13; and submissiveness, .91, .09. Thus, this set of dispositions displays only modest variation in the tightness-looseness of manifested structure.

Loevinger (1957) referred to the level of tightness of a disposition's manifest structure as its characteristic intercorrelation and drew implications for the structural component of personality scale validity. It is noteworthy that a disposition can serve as a relatively unitary cognitive and conceptual act category and still possess either a tight or loose manifested structure.

The Horizontal Dimension: Relations Among Act Categories at the Same Level

In addition to a close analysis of the internal and manifested structure of act categories, a second critical issue pertains to the relations among act categories that are posited to reside at the same level in a given taxonomic framework. A simple list of such categories, each analyzed separately, is undesirable on both heuristic and aesthetic grounds. A taxonomic model that specifies or posits the relations between each act category and every other act category offers a more useful guide to conducting personality research and generating theory. Such a model is offered by the Wiggins circumplex (Wiggins, 1979, 1980).

Briefly, the Wiggins circumplex model is a two-dimensional taxonomy consisting of 16 interpersonal dispositional categories (e.g., dominant, arrogant, calculating, cold) arrayed in a circular fashion. The two major dimensions that define the circumplex, dominant-submissive and agreeable-quarrelsome, are orthogonal to each other in the model. Each of the remaining dispositional categories is posited to possess varying degrees or facets of these two dimensions. A

distinct advantage of the Wiggins circumplex is that it offers a basis for making predictions about the relations among dispositional categories: Orthogonal variables are predicted to be uncorrelated, adjacent variables positively correlated, and opposing variables negatively correlated.

The most direct test of the circumplex model within the act-frequency approach is simply to examine the correlation matrix of act-frequency summaries across all studied categories and then to examine its correspondence to the predicted correlation matrix. The fairest test entails using composites of the most prototypical acts from each category—in this case, the top quartiles or composite-act indices based on the most prototypical 25 acts from each dispositional category. Table 4 shows the correlation matrix of these prototypic composites for the six act categories (above the diagonal) and the correlations predicted on the basis of the circumplex model (below the diagonal). The correlation between the predicted and obtained correlations ($N = 15$) for the six categories is .89 (calculated via Spearman's rho). This finding indicates that, overall, the pattern of predicted correlations corresponds well to those that were obtained.

The absolute magnitudes of the correlations are, however, discrepant from those predicted by the circumplex model, in many cases. This finding points to a key feature of the horizontal level of dispositional categorization within the act frequency approach: Performance of many acts within one dispositional category does not preclude performance of many acts within other dispositional categories, even if they are concep-

Table 4
Correlations of Multiple-Act Criteria With Each Other

Disposition	1.	2.	3.	4.	5.	6.
1. Aloof	—	-.13	.22*	.32**	.46**	.12
2. Gregarious	-.100	—	.55**	-.07	.11	.45**
3. Dominant	-.25	.25	—	-.13	.36**	.23*
4. Submissive	.25	-.25	-.100	—	.00	.36**
5. Hostile	.75	-.75	.00	.00	—	-.11
6. Agreeable	-.75	.75	.00	.00	-.100	—

Note. Correlations to the left of the diagonal are those predicted by the circumflex model; those to the right are the obtained correlations.

* $p < .05$, two-tailed; ** $p < .001$, two-tailed.

tually or semantically opposite to each other. The correlations among act-frequency summaries may not correspond to semantic relations inherent in trait-descriptive vocabularies.

The present data set cannot rule out the hypothesis that methodological artifacts (e.g., general acquiescence or endorsement tendencies) may have unduly inflated the magnitudes of the correlations observed in Table 4 or the possibility that, were they absent, the absolute magnitudes of the correlations would correspond more closely to those posited by the Wiggins circumplex model. But if we hold this potential confound in abeyance for the moment, the present data may indicate the absence of true bipolarity in the act frequencies studied; those who perform many dominant acts, for example, may be neither more nor less apt to perform many submissive acts. If absence of bipolarity among semantically opposed act categories is confirmed by field studies, a different taxonomic framework may be called for by the act frequency approach.

One final conjecture may be advanced: The positive correlations among most multiple-act criteria stem not from methodological artifacts but from a general activity or *g* factor in the act domain. In this case, individuals may reliably differ in the number of acts performed, regardless of the act category within which they are classified. To the extent that such a *g* factor exists, it would have to be partialled out from any assessment device in order to obtain circumplexity in the act domain. Russell (1979) has suggested an analogous partialing of a general factor in the emotional domain; however, in his view the general factor is a purely methodological artifact. On the other hand, a *g* factor in the act domain, if not artifactual, would require a new conceptualization of personality, just as the discovery of a *g* factor in intelligence (Spearman, 1904) required a new conceptualization of intelligence.

The Vertical Dimension: Hierarchic Taxonomic Classification

Beyond the internal structure of dispositional categories and issues surrounding the relations among different categories at the

same level, another important issue pertains to vertical or hierarchic relations among dispositional categories. Broadly speaking, two such taxonomic approaches have been pursued. First, lexical-conceptual analyses of dispositional terms within the natural language have been conducted (e.g., Allport & Odbert, 1936; Cattell, 1957; Goldberg, 1982; Wiggins, 1979). Wiggins (1979), for example, partitions the universe of trait-descriptive terms into seven superordinate categories (e.g., interpersonal, temperamental, material). Within each superordinate category are specific dispositions (e.g., the dispositions of "stingy" and "generous" fall within the superordinate category of material traits). Although they are not explicit in Wiggins's taxonomy, subordinate categories are presumably specific acts that fall within each middle-level dispositional category.

An alternative strategy has been to develop hierarchic classifications based in part on the interrelations among dispositional measures, through factor analysis and related techniques (e.g., Eysenck, 1953; Guilford, 1959). Eysenck's theory of vertical classification, for example, involves extraversion as a superordinate category, with the specific dispositions of liveliness, excitability, sociability, and impulsivity at the second level. Specific habits and responses define subordinate-level categories.

From the vantage point of the act frequency approach, the point of all taxonomic hierarchies is that they must ultimately deal with the categorization of acts. This basic goal is often missed by taxonomic approaches that stop at the level of lexical-conceptual analysis of trait terms or at primary and second-order factor structures capturing the covariation among personality inventory items or scales. Attention to the categorization of acts would grant such taxonomic schemes greater ultimate significance.

A comparison of the hierarchic taxonomy of objects and the taxonomy of acts is instructive (see Table 5). For object categories, Rosch and her associates (1978; Rosch, Mervis et al., 1976) have identified three levels of abstraction: superordinate (e.g., furniture), basic (e.g., chair, table), and subordinate (e.g., kitchen chair, livingroom table). For dispositional terms, Wiggins (1979, 1981) has sug-

gested groupings that might indicate useful superordinate categories (e.g., interpersonal style, temperament, character, mental predicate). Presumably, specific dispositional constructs (e.g., dominance, agreeableness) function as basic level categories. Subordinate categories would consist of single acts (e.g., tallied across single or multiple situations). In this scheme, ordinary dispositional constructs emerge at the basic level within the categorization system for acts, paralleling basic categories of objects.

Dispositional categories sort together acts that are dispersed across time and situation throughout the individual's stream of behavior. In addition to temporal dispersal, the topographic distinctiveness of similarly categorized acts suggests a complexity inherent in dispositional categories that may set them apart from other categorization schemes. What common attributes of prototypically dominant acts warrant the generation of the category "dominance"? Such attributes of acts and their relation to common membership in dispositional categories have received little attention. One possible basis of commonality rests upon similar effects or impacts on the environment (see, e.g., Jones & Davis, 1965; Wiggins, Note 1). But whether that factor would hold across the entire range of specific dispositional categories remains to be determined.

Theoretical Implications of the Act Frequency Approach

Although founded primarily upon a distinctive formulation of the concept of disposition, the act frequency approach carries implications for a broad range of theoretical issues in personality research, including those bearing upon personality consistency, situational analysis, and personality coherence.

Personality Consistency

The issue of consistency and ways of formulating the notion have held a central place in discourse about the nature of personality. The act frequency approach draws a fundamental distinction between behavioral consistency and dispositional consistency. *Behavioral consistency* refers to indices derived

Table 5
Taxonomies of Objects and Acts

Level		
Superordinate	Basic	Subordinate
Concrete object categories		
furniture tree	chair maple	kitchen chair sugar maple
Act-dispositional categories		
interpersonal style	dominance	taking charge at the meeting
temperament	obstinacy	ignoring the associate's suggestions

from the molecular level of single-act analysis. *Dispositional consistency* refers to molar-level multiple-act indices derived from analyzing the cognitive structure of dispositional categories of acts.

Indices of Behavioral Consistency

Consider the data yielded by monitoring the total behavioral output of a sample of persons during two extended periods (Time 1 and Time 2). Prior to any dispositional categorization of acts, several indices of behavioral or act-level consistency can be computed.

Single-act consistency. The temporal consistency of single-act categories (e.g., taking charge of a meeting; attending psychology class) can be gauged. For example, adequate levels of temporal stability have been reported for single-act categories within the domain of conscientiousness (Mischel & Peake, 1982).

Consistency of overall act output. Persons may demonstrate reliable individual differences in aspects of the total number of acts performed during a period of observation, without regard to any dispositional categorization of acts. Two additional consistency measures of overall act output are (a) consistency in overall act versatility—the relative position maintenance of individuals across periods of observation on the number of different acts performed, with same-act repetitions not counted and (b) consistency in overall situational scope—the relative position

maintenance of individuals across periods of observation on the total number of different situations in which acts are performed. Note that these indices of behavioral consistency may be calculated prior to any dispositional categorization and thus are less relevant to personality consistency.

Indices of Dispositional Consistency

Within the act frequency approach, single-act consistency and the intercorrelations among single-act categories are properly considered to be predispositional matters. Thus, the question of why some single acts correlate with certain others, whereas some do not, is primarily a behavioral rather than a dispositional issue. Personality research emerges more clearly when single acts are categorized and analysis moves from a molecular to a molar level. A fundamental conceptual contribution of dispositional constructs is to offer a system for categorizing single-act units into middle-level conceptual units.

Basic dispositional consistency: Act-trend consistency. An act trend is the tally of all acts falling within the boundaries of a multiple-act dispositional category that are performed by an individual during a period of observation. Act-trend consistency refers to relative position maintenance of individuals on act trends for a specific disposition across periods of observation. It should be noted that act-trend consistency can be high even if individuals do not display the same specific acts across time periods. Consistency of frequency within category rather than same-act repetition becomes the critical index of consistency.

Two additional measures of dispositional consistency are (a) consistency in dispositional versatility—the relative position maintenance of individuals across periods of observation on the number of different acts performed within a specific dispositional category, excluding same-act repetitions, and (b) Consistency in dispositional-situational scope—relative position maintenance of individuals across periods of observation on the number of different situations within which prototypical acts for a specific dispositional category are performed. In the first, two individuals may obtain the same act-trend in-

dex for dominance, for example, but differ markedly in the range and versatility of acts they display in manifesting their dominance. In the second, two individuals may obtain the same act-trend index for dominance, but one may manifest dominance in delimited kinds of settings (e.g., only at home) whereas others may display the same absolute number of dominant acts across the same time period, but disperse them across a wider range of settings (e.g., at home, at work, in leisure settings). Thus, the act frequency approach offers several novel consistency indices that elude more traditional approaches that assess scale or rating consistency across two or more time periods. A fuller treatment of these consistency issues in personality psychology can be found in Ozer's (1982) formulation.

Ipsative measures of dispositional consistency. Unlike strategies that employ trait-rating indices, Q sorts, or ranking measures, the act frequency approach provides a true zero point: when no acts within a given dispositional category are exhibited. Therefore, ratio measures can be developed by which act frequencies in one dispositional category are compared with act frequencies for an individual in all other categories. Thus, those researchers persuaded by arguments in favor of idiographic analysis can derive consistency indices for three ipsative measures: (a) idiographic act trend—the act tally for a given dispositional category divided by the person's index of overall act output, (b) idiographic dispositional versatility—the number of different acts performed within a given dispositional category divided by the person's index of overall act versatility, and (c) idiographic dispositional-situational scope—the number of different situations in which acts for a given dispositional category are performed divided by the person's index of overall situational scope.

Behavioral Consistency and Dispositional Breadth

The breadth of dispositions, as Mischel and Peake (1982) have rightly noted, is one of the central issues in continuing controversies about the adequacy of traditional formulations of personality. They have recently reported a study of dispositional breadth that

can be usefully viewed from the vantage point of the act frequency approach.

For a sample of 63 college students, Mischel and Peake analyzed 19 measures from the domain of conscientiousness/studiousness (e.g., attending psychology class, reading reserve library materials punctually, keeping the dorm room tidy). Adequate levels of single-act consistency were found, with a mean composite reliability, averaged across the 19 single-act categories, of .66. The 19 measures of single-act categories were intercorrelated, yielding an average between-act r of .13 (or .20 when attenuation due to unreliability of measures is taken into account). These intercorrelations between single acts, termed *cross-situational consistency coefficients* are taken as measures of dispositional breadth for the construct of conscientiousness/studiousness. They conclude that the average r of .13 (or .20) offers evidence for a relatively stable mean level of individual differences but also reflects behavioral discriminativeness (sensitivity to situational cues). They suggest (a) that we seek to understand when and why these obtained coherences among single-category acts emerge and when and why they fail to emerge, and (b) that we search for consistency at different levels of abstraction—from subordinate, molecular levels to molar and superordinate levels.

Mischel and Peake's (1982) use of the average intercorrelation among single acts most closely resembles the tightness-looseness of manifested dispositional structure. That is, tightly-structured dispositions are considered to be broad or global. Note that a trade-off exists between the tightness of a dispositional category and the number of observations needed for an adequate act trend: The tighter the manifested disposition, the fewer the number of observations required.

Within the act frequency approach, dispositional breadth takes on at least four additional meanings. In each case, dispositional breadth is an empirical matter and not fundamentally a conceptual issue. For a given disposition, *versatility* and *situational scope* refer to the breadth of an individual's repertoire of prototypical acts and the breadth of contexts in which they are performed, respectively. These two measures of dispositional breadth generate person variables. In

contrast, two measures of breadth gauge properties of the dispositional construct itself. *Category volume* refers to variations among dispositions in the number of acts considered to be prototypical members, ranging from few to many. Finally, *category structure* refers to the tightness or looseness of the correlational matrix for manifested acts falling within the category boundaries.

Situational Analysis

In its most general form, the act frequency approach grants little place to situational analysis. In assessing individuals on a personality disposition, act frequency analysis sums displays of prototypical acts without regard for attributions of causality to person or situation. At this level, it remains strictly descriptive, entailing situational considerations only as qualifications in the description of prototypical acts. For example, an act of displaying little emotion when meeting an old friend at the airport constitutes an aloof act, but displaying little emotion at a formal ceremony or while reading the newspaper probably does not. Beyond that, the acts, once specified in this manner, are credited to the individual's account independently of any inferences of causal attribution to person or situation and without any effort to match or control for situational and related factors.

It follows from this approach that in field monitoring of persons for the purpose of dispositional assessment, the basic unit of comparative measurement is temporal. That is, two persons are deemed similarly dominant if they have achieved equivalent tallies of prototypically dominant acts over an equal period of observation, regardless of whether they differ in age, for example, or in the kind of social ecologies within which they function (e.g., one may be a young bus driver and the other an elderly business executive).

However, the act frequency approach can be conjoined with situational analysis by subaggregating act trends according to specific contexts or categories of situations. This procedure would entail developing multiple-act indices of a given dispositional construct (within specified subsets of situations) and applying them to individuals (e.g., at work, at home). Such subaggregation resembles

Table 6
Aversive Acts Aggregated by Situation and Period Of Observation (Hypothetical)

Person	Situation						Frequency	
	Mother	Father	Younger sister	Older sister	Brother	Grandmother	Time 1	Time 2
Mother	—	17	3	8	24	11	63	67
Father	4	—	5	11	13	2	35	31
Younger sister	2	3	—	9	10	5	29	33
Older sister	13	18	4	—	20	12	67	72
Brother	5	8	3	6	—	7	29	34
Grandmother	4	1	10	4	2	—	21	14
Total	28	47	25	38	69	37		

procedurally Patterson's (1975, 1979) functional analysis of coercive behaviors. Patterson and his associates have observed individuals within the context of family interaction. Table 6 presents a hypothetical illustration of the kinds of frequency tallies yielded by their observational strategy. The act category for aversive behaviors, for example, might include crying, ignoring others, noncomplying with requests, teasing, whining, yelling, and humiliating others. The Time 1 column sums the frequency of aversive acts by each family member over the period of observation. The Time 2 column gives a hypothetical result for a second period of observation. The latter information, typically not presented, serves to demonstrate that by tracking persons useful data can be produced for an act frequency assessment of the dispositional construct of aversiveness.

Table 6 also breaks down the manifestations of aversive acts according to the family member with whom the person was interacting. These units can be treated as situations or, within Patterson's theoretical perspective, as discriminative stimuli (Patterson & Bechtel, 1977). The primary focus of Patterson's analyses has not been upon dispositional constructs, and he has not analyzed the internal structure of the constructs (e.g., aversiveness). Nevertheless, the operations employed would yield summary indices of the kind required by the act frequency approach (e.g., the Time 1 and Time 2 columns) as well as multiple-act indices that are situationally specific (e.g., Mother and Brother columns).

Finally, Table 6 illustrates the usefulness of an index of situational scope in act frequency analysis. *Situational scope* assesses the range or variety of situational contexts in which the individual manifests prototypical acts from a dispositional category (e.g., directing aversive acts to all members of the family versus only to the youngest sister). Situational scope is a person variable and an analogue to dispositional versatility (the range or variety of different prototypical acts manifested over a period of observation, e.g., yelling, teasing, and whining versus just teasing).

Within an act frequency analysis, each individual's conduct can be tallied across all situations or across specific subclasses of situations. If act-trend indices differ significantly across certain classes of situations and the differential is stable over time, then this contingent relation could be used in predicting future act trends. Detailed knowledge of situational contingencies of act trends might warrant a shift of dispositional constructs from the status of categorical summaries (Hampshire, 1953) to that of hypothetical propositions (Ryle, 1949).

In contrast to Hampshire, Ryle and others (Tuomela, 1978) argue that personal dispositions are hypothetical propositions, akin to dispositional statements in physics (e.g., "the glass is brittle") and take the form: It is likely or a good bet that the entity will respond in certain ways (x, y, z ; e.g., "shatter") to certain circumstances (a, b, c ; e.g., "being hit by a stone"). This strategy of subaggregation of act trends by types of situations presupposes some advances in formulating effective sys-

tems for the categorization of situations (Magnusson, 1981).

Personality Coherence

As Cattell (1957) and Block (1977) have recognized, it is useful to distinguish between kinds of personality data. Most personality research entails data subsumed by four categories: O data (based upon observer reports), L data (based upon personal and societal life outcomes), T data (based upon laboratory test situations), and S data (based upon self-reports). Temporal stability of O data and S data can be demonstrated (Mischel, 1968; Block, 1971). Furthermore, substantial relations that make psychological sense can be shown among these various kinds of personality data, giving evidence for the orderly and robust phenomena with which this field of inquiry deals. For example, in the analysis of longitudinal data, Block (1971) has found impressive coherence between Q-sort descriptions for the adolescent period (O data) and personality scale scores for the mid-30s (S data), whereas Block and Block (1980), Buss (1981b), and Buss, Block, and Block (1980) have identified meaningful patterns of relations between O data and T data during the childhood years. Also, S data have been related to a host of life outcomes (L data), including school achievement (Gough, 1968) and architectural creativity (Hall & MacKinnon, 1969).

The act frequency approach makes two contributions to the study of personality coherence. First, it offers act trends (A data) as a fifth hybrid class of personality data, which can be usefully differentiated from each of the other four types. Second, it highlights an omission that handicaps any personality-research agenda that restricts itself to examining the interrelations within or among typical forms of O data, L data, T data, and S data. Consider the example of a researcher who sets out to study professional musicians by assessing music-conservatory students through (a) personality descriptions by peers (O data), (b) performance in laboratory tests (T data), and (c) mail-back personality inventories (S data), which in later years are all related to personal and professional life outcomes (e.g., marital status, prominence as a

performer: L data). What is lacking in this research design is any monitoring of what the individuals do all day—a missing link that can be supplied in part by the act-frequency approach.

Act-Trend Data (A Data)

The classification of S, O, L, and T data is based primarily upon the source of data (i.e., from self, observer, laboratory, or society and other sciences). In this sense, A data are a hybrid species that can derive from the monitoring of acts by either self or observers. But from an alternative perspective, the typical forms of S and O data actually draw upon only limited subclasses of data from their respective sources and, in each case, different subclasses than those that generate A data. S data are typically based upon self-ratings of dispositions or upon assessments of dispositions from personality scales, whereas A data are based specifically on tallies of self-monitored acts. O data are typically derived from dispositional attributions by observers; A data are based upon tallies of observers' recordings of specific monitored acts.

Before comparing A data with the other kinds of personality data, several additional features of A data warrant notice. First, the act remains the primitive term in this approach and requires further explication. Suffice it to note here that acts as typically perceived by observers (Murray, 1938) entail not only the physical movements (or *actones*, in Murray's terminology) but also ingredients of style and intensity of the act and of its context. All of these elements play a role (not yet fully examined) in the categorization and prototypicality rating of specific acts vis-à-vis dispositional constructs. Second, adequate analysis of the internal structure of dispositional-act categories presents a challenge. Issues in the act-nomination and prototypicality-rating procedures have already been noted. The phrasing of written accounts of acts is another issue. Queneau (1947/1981) has demonstrated how a simple social episode can be depicted in 195 different literary styles (e.g., narrative, insistence, reported speech, exclamations). And the gathering of prototypicality ratings of ongoing or recorded acts (e.g., videotaping) presents its own problems.

Third, the challenge of assessing act trends of individuals over extended periods of time (required by the act frequency approach) poses formidable problems. A variety of methods are available for such assessment, but each method carries serious limitations. Retrospective accounts of act performance, both by actor and observers, offer one method. "Beeper" technology (e.g., Czikszentmihalyi, 1975; Pawlik & Buse, 1982; Sjoberg, 1981), in which individuals carry devices that signal at random intervals, notifying the subjects to record their actions at that moment, offers a second method. Contemporaneous observer recording of acts offers a third method. Each poses a unique set of problems, and ideally, convergence should be obtained across methods.

Barker and his associates at the Midwest Psychological Field Station (Barker & Wright, 1955; Barker, 1963) initially sought ways of segmenting the stream of behavior before they shifted from behavior episodes to behavior settings as the primary unit of analysis in ecological psychology. The act frequency approach requires a return to that original, person-centered, observational mission but points beyond *One Boy's Day* (Barker & Wright, 1951) to, for example, *One Dominant Boy's Day*. This task will require attention to the perceptual units of social action (Collett, 1980; Newstson, Engquist, & Bois, 1977), to the role of context, and to pluralistic meanings in the interpretation of social acts (Rommelteit, 1980). Procedures for self-monitoring and other monitoring of the stream of behavior have received increasing attention in recent research (Epstein, 1979, 1980; Forgas, 1976; McGowan & Gormley, 1976; Mischel & Peake, 1982; Pervin, 1976).

A Data and O Data

O data, as recorded consensual and stable impressions that observers form about the personalities of target individuals, constitute fundamental sources for personality assessment (Block, 1961; Wiggins, 1973). The processes entailed when observers move from the perception of acts to the attribution of dispositions have also been a major topic in re-

search on person perception (Hastorf, Schneider, & Polefsha 1970).

The act frequency approach suggests that inferences about the dispositions of others are based largely but not completely on memory traces of observed act trends. This position has wide-ranging implications for the direction and interpretation of attribution research. For example, the influential research program of Jones and Davis (1965) is guided by a notion of the act and a general conception of disposition that are not seriously at odds with the act frequency approach. Yet their typical research design presents judges with a single act of the target person, from which inferences about dispositions are requested. Indeed, their construct of the "correspondence of inference" specifies that "a disposition is being rather directly reflected in behavior and that this disposition is unusual in its strength or intensity" (p. 264). In contrast, the act frequency approach holds explicitly that a single act is an inadequate basis for dispositional inferences; such inferences are more appropriately based upon act trends over a period of observation. Neither the intensity nor the consequences of a single act offer a strong or sensible foundation for dispositional inference. Thus, much of the attribution-research literature based on single acts or adjectival descriptions is largely irrelevant from the standpoint of the act frequency approach.

Inferring dispositions from observed-act trends must be recognized as a complex cognitive process. Any act is a potential member of several dispositional categories, especially at the periphery of act categories. The inference process presumably entails the encoding and monitoring of topographically dissimilar acts and requires tracking of a person's act trends, which are extended over time and interspersed among other assortments of acts and act trends. Finally, the internal structure of manifested dispositions may not generally be very tight. Yet to gain an understanding of act-to-disposition inferences, direct study of the perceptions of act trends and inferences about them is necessary.

The evidence that dispositional inferences may be influenced by factors other than the perception of act trends complicates matters

even more. First, the nature of natural cognitive categories may lead to asymmetric expectations at the level of act-to-category judgements. If the observed person displays a highly prototypical act (e.g., of dominance), then the perceived likelihood of his or her performing a given peripheral act may be deemed relatively high. But in the reverse case, a person performing a peripheral act may not be expected to perform a given core act. Rips (1975) has found similar asymmetries of inference in examining categories of natural objects (e.g., if a prototypical bird, such as a robin, is found to have a new contagious disease, the judged likelihood is also high for a more peripheral form of bird, such as a duck, but the reverse does not appear to hold). Asymmetric expectations of this sort could affect the perception of act trends and warrant study. Second, other cognitive schemata, perhaps based upon empirical regularities, are at play in dispositional inferences, apart from the role of observed act trends. These factors include inferences based upon nonact attributes (e.g., clothing style) and those derived from cross-dispositional implicative systems (e.g., evidence for wit leading to inferences regarding intelligence).

A Data and L Data

Life-outcome data are typically found in indices derived by social institutions and other scientific disciplines. The range includes biological and medical indices (e.g., gender, diagnosed alcoholism), sociodemographic indices (e.g., social class), institutional outcomes (e.g., graduation from law school, award for creative performance, promotion to higher position), and even certain socially salient single acts (e.g., of heroism, crime). The relation of act-trend indices for personality dispositions to specific forms of L data is an empirical question and represents an important research agenda linking personality to sociology and the other sciences.

A Data and T Data

The relations between T data collected under laboratory conditions and A data mon-

itored from daily life depend upon several factors. The degree of mundane realism (Aranson & Carlsmith, 1968) of the contrived laboratory situation has some bearing, but two other considerations are perhaps more important. First, the act frequency approach offers a procedure for the conceptual analysis of dispositional constructs. In contrast, T data are often based upon contrived acts whose centrality to the disposition at issue is not established. Second, the act frequency approach considers multiple-act indices in the form of act trends as appropriate criteria for personality prediction, whereas studies employing T data have often sought to predict single-act criteria (Epstein, 1980). The degree of coherence to be expected between A data and T data depends upon the adequacy of procedures for generating T data, a point that has been amply illustrated elsewhere with regard to the relations between O data and T data (Block & Block, 1980).

A Data and S Data

The use of A data as multiple-act-criterion indices for the validation of personality scales has been demonstrated (Buss & Craik, 1980, 1981, in press). In addition, the act frequency approach contributes new facets to the more detailed conceptual analysis of psychological scores and measures (Gough, 1965). These conceptual indicators based upon A data include *act density* (the number of significant act correlates of a scale within the nominally appropriate act category), *act bipolarity* (the number of significant act correlates of a scale from the semantically opposing act category), and *act extensity* (the number of significant act correlates within act categories other than the nominally appropriate and semantically opposing act categories) (Buss & Craik, in press; Buss, 1981a, 1981c).

Summary and Discussion

The act frequency approach to personality adopts the categorical-summary view of personal dispositions. A dispositional assertion refers to the relative frequency with which the individual has displayed acts counting as members of that dispositional category, over

a period of observation. These multiple-act indices, or act trends, are a fundamental form of personality data and represent a theoretically sanctioned union of the concept of disposition with principles of aggregation and reliability of measurement.

This approach to personality treats dispositional constructs as natural cognitive categories of topographically dissimilar acts, with status of act members varying in prototypicality from core to peripheral standing. Recent advances in cognitive psychology provide guidance and procedures for an empirical research program examining the internal structure of dispositional categories of acts as well as the horizontal and vertical dimensions of this system of act categorization.

Although founded in behavioral observation, the act frequency approach draws a basic distinction between behavioral consistency (covariation among observed acts) and dispositional consistency (covariation among act-trend indices) and identifies several distinctive facets of dispositional breadth. The primary frame of measurement in this approach is the period of observation rather than a set of specified situations. In its most general form, the act frequency approach proceeds without regard for attributions of causality to persons or situations. However, for analytic purposes, the approach can be joined to any system of situational classification, examining act trends subaggregated according to specific types of situation. Finally, the act-frequency approach contributes act-trend data (*A* data) as a neglected ingredient in the delineation and understanding of coherence in personality, augmenting the more often explored forms of observer-based (*O* data), self-report (*S* data), laboratory (*T* data), and life-outcome (*L* data) measures.

Dispositional constructs as categories of acts are sociocognitive devices or inventions—emergents of sociocultural evolution (Campbell, 1965). An effort to understand the origins and basis of this system for the categorization of acts leads to some of the most difficult and problematic questions of personality theory. Dispositional constructs serve the specific function of facilitating the categorization of trends in the acts of persons. It is reasonable to assume that core or prototypical acts served as reference acts around

which dispositional categories emerged (Rosch, 1975a; Rosch, Mervis et al., 1976). Three possible sources of emergence can be identified.

First, dispositional categories may have developed to capture observed cooccurrences of acts in the streams of individuals' behavior. Individual differences in frequencies for single acts may have preceded the discernment and conceptualization of individual consistencies for cooccurrences in multiple-act categories. In both cases, covariations in the structure of individual action form the basis of dispositional categories, in a way not unlike that hypothesized for categories of objects (Craik, 1981; Rosch & Mervis, 1975; Rosch, Mervis et al., 1976).

Second, dispositional categories may have formed around reference acts that share a salient or notable attribute, somewhat or entirely apart from their cooccurrence within the stream of individuals' behavior. Jones and Davis (1965) focus upon the assumed desirability of the act's effects or its hedonic relevance. Wiggins (Note 1) also points to common consequences of acts as the key attribute but strives for a nonevaluative consideration from an institutional or rule-system standpoint (e.g., an act likely to harm or injure another counts as aggressive in the context of rules for classifying the social consequences of actions). Given this possibility, within the act frequency approach the assumption regarding the internal structure of dispositional categories would take precedence over the summary notion, and a looser depiction of variation in the structure of manifested individual acts could be anticipated.

Third, dispositional constructs could reflect generative mechanisms of action. In the domain of colors, human categorization appears to possess a physiological basis (i.e., focal colors correspond to properties of color-vision; Kay & McDaniel, 1978; Rosch, 1975a) from which the cross-cultural generality of Rosch's findings in this domain may follow. The relation of dispositional categories of acts to generative mechanisms of act trends cannot be established at this time but represents a central issue in personality theory (Wiggins, Note 2). If dispositional categories are formed primarily around attributes of

acts that possess cultural salience, then important cross-cultural variations in content and internal structure are possible and the likelihood that such categories mirror or provide important clues about generative mechanisms is diminished. Cross-cultural research bearing on this topic is appearing (White, 1980), but studies dealing specifically with the internal cognitive structure of dispositional categories would speak directly to this issue.

Within current personality theory, Alston (1970, 1975, Note 3) has identified a conceptual divide between frequency concepts of disposition and purposive-cognitive concepts. He deems this distinction the most fundamental alternative for personality research. Unlike frequency concepts, purposive-cognitive concepts do not entail a category of occurrences that can be specified to count as displays of a disposition. Instead, they derive their meaning and standing from their place in a theoretical framework (typically motivational in nature) intended to explain behavioral occurrences. Purposive-cognitive concepts include desires, beliefs, and abilities that function within a field of tendencies between activated desires and guiding beliefs on the one hand and manifested behavior on the other. Alston points to psychoanalytic theory (Rapaport, 1959) and cognitive social-learning conceptualizations of personality (Mischel, 1973) as distinctive examples of the purposive-cognitive approach.

Alston further argues that in addition to other theoretical jobs, purposive-cognitive concepts offer an explanation of frequency dispositions. Between observed acts and purposive-cognitive concepts, frequency dispositions form a middle level of analysis. But it is possible, instead, that the act frequency and purposive-cognitive concepts may be components of incommensurate approaches. Consider Figure 1: The act frequency approach would assess Person A as more dominant than Person B and forecast a continuing differential manifestation of dominant acts. Marshalling purposive-cognitive concepts requires a more indirect procedure, including a theoretical formulation of the individual and an interpretation of the observed behavior. For example, the analysis of mood states, displaced affective outbursts, slips of the

tongue, and dreams might lead to the inference that Person B has a strong need for dominance that is inhibited by a stronger fear of rejection; Person A, with a weak need for dominance, incurs heavy psychological costs in his many acts of dominance, which at some points are motivated by a fear of failure in an institutional role that requires such displays and at other points by a fear of allowing someone else to take control of situations. The contrast in the functions of the frequency concept of dominance and the purposive-cognitive concept of need for dominance in the analysis of acts within the stream of behavior is striking. The purposive-cognitive explanation for Person A's observed behavior also requires a subaggregation of dominant acts not entailed by the act frequency approach. The relation of frequency and purposive-cognitive approaches clearly requires further theoretical examination.

In his search for intraindividual measures of personality, G. W. Allport (1937, 1958, 1962) often championed F. H. Allport's (1937) concept of *teleonomic trend*. Like dispositional act trends, teleonomic trends are derived from the monitoring of an individual's daily acts over a period of observation. Instead of being aggregated into dispositional categories, however, acts are ordered according to what the person is trying to do through them (e.g., seeking justice, trying to maintain self-esteem, avoiding responsibility, helping others, or gaining the attention of elders). According to F. H. Allport, such concepts can be used objectively and reliably by observers to order acts in a way that indicates how the person is trying to make adjustments or changes in his or her environment through everyday acts.

A purposive-cognitive variant of teleonomic-trend analysis can be found in the recent formulation of *personal-projects analysis* (Palys, Little, & Baker-Brown, Note 4). This approach examines the acts of persons by means of the self-reported ordering of them according to the concept of personal projects, that is, sequences of goal states and means-end, or instrumental, acts. The concept can be considered a type of serial proceeding within Murray's (1938) framework. Act frequency analysis of dispositions and personal-projects analysis offer two quite dif-

ferent systems for the classification of acts. The act of complaining when served a tough steak at a restaurant, for example, may be classified with other topographically dissimilar manifestations of dominance in the act frequency approach but might be grouped instead with other and different topographically dissimilar acts within the personal-projects category such as getting a promotion (in this instance, by impressing the boss).

Efforts to clarify the conceptual and empirical interrelations among various middle-level personality approaches to the categorization of acts and to explanatory systems offer an important road to the revival of theoretical discourse that Maddi (1980) has advocated. Indeed, this endeavor is likely to occupy personality theorists in a profitable fashion during this decade of the 1980s. In the meantime, the act frequency approach to personality poses an extensive research agenda and raises a host of novel questions. What are the prototypical act members of important dispositional categories? How do dispositional constructs differ in terms of their category volume, the range and central tendency of act membership, and the tightness of their manifested structure? What are the effects of various instructional sets upon act nominations and prototypicality ratings? How do alternative indices of act prototypicality interrelate? Does the average between-rater agreement for prototypicality ratings of acts differ from that for objects? Are there age-specific variations in prototypical acts for some dispositional constructs? Does act-trend analysis support a circumplex model of interpersonal dispositions? In person perception, are there asymmetries of inference toward more prototypical act members of dispositional categories? What levels and forms of coherence obtain in the relations of act-trend data to observer ratings, to laboratory and self-report measures, and to significant life outcomes?

Reference Notes

- Wiggins, J. S. *In defense of traits*. Invited address to the Ninth Annual Symposium on Recent Developments in the Use of MMPI, Los Angeles, February 28, 1974.
- Wiggins, J. S. *Cattell's system from the perspective of mainstream personality theory*. Unpublished man-

- script, University of British Columbia, Vancouver, British Columbia, Canada, 1979.
- Alston, W. P. *A conceptual divide in personality descriptions*. Paper presented at the meeting of the American Psychological Association (invited address to Division 8), September 1973.
 - Palys, T. S., Little, B. R., & Baker-Brown, G. *A project-oriented inquiry into community organization, dynamics and satisfactions*. Unpublished manuscript, University of British Columbia, Vancouver, British Columbia, Canada, 1980.

References

- Addis, L. Dispositions, explanation and behavior. *Inquiry*, 1981, 24, 205-227.
- Allport, F. H. Teleonomic description in the study of personality. *Character and Personality*, 1937, 6, 202-214.
- Allport, G. W. Personality and character. *Psychological Bulletin*, 1921, 18, 441-455.
- Allport, G. W. Concepts of trait and personality. *Psychological Bulletin*, 1927, 24, 284-293.
- Allport, G. W. What is a trait of personality? *Journal of Abnormal and Social Psychology*, 1931, 25, 368-372.
- Allport, G. W. *Personality: A psychological interpretation*. New York: Holt, 1937.
- Allport, G. W. What units shall we employ? In G. Lindzey (Ed.), *Assessment of human motives*. New York: Rinehart, 1958.
- Allport, G. W. The general and the unique in psychological science. *Journal of Personality*, 1962, 30, 405-422.
- Allport, G. W. Traits revisited. *American Psychologist*, 1966, 21, 1-10.
- Allport, G. W., & Allport, F. H. Personality traits: Their classification and measurement. *Journal of Abnormal and Social Psychology*, 1921, 16, 6-40.
- Allport, G. W., & Odbert, H. S. Trait-names: A psycholinguistic study. *Psychological Monographs*, 1936, 47(1, Whole No. 211).
- Alston, W. P. Toward a logical geography of personality: Traits and deeper lying personality characteristics. In H. D. Kiefer & M. K. Munitz (Eds.), *Mind, science and history*. Albany, N.Y.: SUNY Press, 1970.
- Alston, W. P. Traits, consistency and conceptual alternatives for personality theory. *Journal for the Theory of Social Behavior*, 1975, 5, 17-48.
- Armstrong, D. M. Dispositions are causes. *Analysis*, 1969, 30, 23-36.
- Aronson, E. & Carlsmith, J. M. Experimentation in social psychology. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology*, (Vol. 2, 2nd ed.). Reading, Mass.: Addison-Wesley, 1968.
- Barker, R. G. (Ed.). *The stream of behavior*. New York: Appleton, 1963.
- Barker, R. G., & Wright, H. F. *One boy's day*. New York: Harper & Row, 1951.
- Barker, R. G., & Wright, H. F. *Midwest and its children*. New York: Harper & Row, 1955.
- Block, J. *The Q-sort method in personality assessment and psychiatric research*. Springfield, Ill.: Charles C. Thomas, 1961.
- Block, J. *Lives through time*. Berkeley, Calif.: Bancroft Books, 1971.

- Block, J. Advancing the psychology of personality: Paradigmatic shift or improving the quality of research? In D. Magnusson & N. S. Endler (Eds.), *Personality at the crossroads: Current issues in interactional psychology*. Hillsdale, N.J.: Erlbaum, 1977.
- Block, J. H., & Block, J. The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.), *Minnesota Symposia on Child Psychology* (Vol. 13). Hillsdale, N.J.: Erlbaum, 1980.
- Brandt, R. B. Traits of character: A conceptual analysis. *American Philosophical Quarterly*, 1970, 7, 23-37.
- Buss, D. M. *The act frequency analysis of interpersonal dispositions*. Unpublished doctoral dissertation, University of California, Berkeley, 1981. (a)
- Buss, D. M. Predicting parent-child interactions from children's activity level. *Developmental Psychology*, 1981, 17, 59-65. (b)
- Buss, D. M. Sex differences in the evaluation and performance of dominant acts. *Journal of Personality and Social Psychology*, 1981, 40, 147-154. (c)
- Buss, D. M. Evolutionary biology and personality psychology: Implications of genetic variability. *Personality and Individual Differences*, 1983, 4, 51-63.
- Buss, D. M., Block, J. H., & Block, J. Preschool activity level: Personality correlates and developmental implications. *Child Development*, 1980, 51, 401-408.
- Buss, D. M., & Craik, K. H. The frequency concept of disposition: Dominance and prototypically dominant acts. *Journal of Personality*, 1980, 48, 379-392.
- Buss, D. M., & Craik, K. H. The act frequency analysis of interpersonal dispositions: Aloofness, gregariousness, dominance and submissiveness. *Journal of Personality*, 1981, 49, 174-192.
- Buss, D. M., & Craik, K. H. Act prediction and the conceptual analysis of personality scales: Indices of act density, bipolarity, and extensity. *Journal of Personality and Social Psychology*, in press.
- Campbell, D. T. Variation and selective retention in socio-cultural evolution. In H. R. Barringer, G. I. Blanksten, & R. W. Mack (Eds.), *Social change in developing areas*. Cambridge, Mass.: Schenkman, 1965.
- Cattell, R. B. *Personality and motivation structure and measurement*. Yonkers-on-Hudson, N.Y.: World Book, 1957.
- Collett, P. Segmenting the behaviour stream. In M. Brenner (Ed.), *The structure of action*. New York: St. Martin's Press, 1980.
- Craik, K. H. The personality research paradigm in environmental psychology. In S. Wapner, S. B. Cohen, & B. Kaplan (Eds.), *Experiencing the environment*. New York: Plenum, 1976.
- Craik, K. H. Comment on "The psychological representation of molar physical environments" by Ward and Russell. *Journal of Experimental Psychology: General*, 1981, 110, 158-162.
- Cummins, R. Dispositions, states and causes. *Analysis*, 1974, 34, 194-204.
- Csikszentmihalyi, M. *Beyond boredom and anxiety*. San Francisco: Jossey-Bass, 1975.
- Epstein, S. The stability of behavior: I. On predicting most of the people much of the time. *Journal of Personality and Social Psychology*, 1979, 37, 1097-1126.
- Epstein, S. The stability of behavior: II. Implications for psychological research. *American Psychologist*, 1980, 35, 790-806.
- Eysenck, H. J. *The structure of human personality*. New York: Wiley, 1953.
- Eysenck, H. J. *A model for personality*. Berlin: Springer-Verlag, 1981.
- Fishbein, M. The prediction of behaviors from attitude variables. In K. K. Sereno & C. D. Mortensen (Eds.), *Advances in communication research*. New York: Harper & Row, 1972.
- Fishbein, M., & Ajzen, I. Attitudes toward objects as predictions of single and multiple behavioral criteria. *Psychological Review*, 1974, 81, 59-74.
- Forgas, J. P. The perceptions of social episodes: Categorical and dimensional representations in two different social milieus. *Journal of Personality and Social Psychology*, 1976, 34, 199-209.
- Goldberg, L. R. From ace to zombie! Some explorations in the language of personality. In C. O. Spielberger & J. N. Butcher (Eds.), *Advances in personality assessment* (Vol. 1). Hillsdale, N.J.: Erlbaum, 1982.
- Gough, H. G. Conceptual analysis of psychological test scores and other diagnostic variables. *Journal of Abnormal Psychology*, 1965, 70, 294-320.
- Gough, H. G. An interpreter's syllabus for the California Psychological Inventory. In P. McReynolds (Ed.), *Advances in psychological assessment* (Vol. 1). Palo Alto, Calif.: Science and Behavior Books, 1968.
- Guilford, J. P. *Personality*. New York: McGraw-Hill, 1959.
- Hall, W. B., & MacKinnon, D. W. Personality inventory correlates among architects. *Journal of Applied Psychology*, 1969, 53, 322-326.
- Hampshire, S. Dispositions. *Analysis*, 1953, 14, 5-11.
- Hampson, S. E. Person memory: A semantic category model of personality traits. *British Journal of Psychology*, 1982, 73, 1-11.
- Hastorf, A. H., Schneider, D. J., & Polefka, J. *Person perception*. Reading, Mass.: Addison-Wesley, 1970.
- Horowitz, L., Inouye, D., & Siegelman, E. Y. On averaging judges' ratings to increase their correlation with an external criterion. *Journal of Consulting and Clinical Psychology*, 1979, 47, 453-458.
- Jaccard, J. J. Predicting social behavior from personality traits. *Journal of Research in Personality*, 1974, 7, 358-367.
- Jones, E. E., & Davis, K. E. From acts to dispositions: The attribution process in person perception. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2). New York: Academic Press, 1965.
- Kay, P., & McDaniel, C. K. The linguistic significance of the meanings of basic color terms. *Language*, 1978, 57, 383-405.
- Leary T. *Interpersonal diagnosis of personality*. New York: Ronald Press, 1957.
- Loevinger, J. Objective tests as instruments of psychological theory. *Psychological Reports*, 1957, 3, 635-694 (Monograph No. 9).
- Maddi, S. R. The uses of theorizing in personology. In E. Staub (Ed.), *Personality: Basic aspects and current research*. Englewood Cliffs, N.J.: Prentice-Hall, 1980.
- Magnusson, D. (Ed.). *Toward a psychology of situations: An interactional perspective*. Hillsdale, N.J.: Erlbaum, 1981.
- Magnusson, D., & Endler, N. S. (Eds.). *Personality at the cross-roads: Current issues in interactional psychology*. Hillsdale, N.J.: Erlbaum, 1977.

- McClelland, D. C. *The nature of human motivation*. Glenview, Ill.: Scott, Foresman, 1983.
- McGowan, J., & Gormly, J. Validation of personality traits: A multicriteria approach. *Journal of Personality and Social Psychology*, 1976, 34, 791-795.
- Mischel, W. *Personality and assessment*. New York: Wiley, 1968.
- Mischel, W. Toward a cognitive social learning reconceptualization of personality. *Psychological Review*, 1973, 80, 252-283.
- Mischel, W., & Peake, P. In search of consistency: Measure for measure. In M. P. Zanna, E. T. Higgins, & C. P. Herman (Eds.), *Consistency in social behavior: The Ontario Symposium of Personality and Social Psychology* (Vol. 2). Hillsdale, N.J.: Erlbaum, 1982.
- Murray, H. A. *Explorations in personality*. New York: Oxford, 1938.
- Newton, D., Engquist, G., & Bois, J. The objective basis of behavior units. *Journal of Personality and Social Psychology*, 1977, 35, 847-862.
- O'Shaughnessy, B. The powerlessness of dispositions. *Analysis*, 1970, 31, 1-15.
- Ozer, D. J. *Consistency, coherence, and convergence: A framework for the study of personality*. Unpublished doctoral dissertation, University of California, Berkeley, 1982.
- Patterson, G. R. A three-stage functional analysis for children's coercive behaviors: A tactic for developing a performance theory. In B. C. Etzel, J. M. LeBlanc, & D. M. Baer (Eds.), *New developments in behavioral research: Theory, methods and applications*. Hillsdale, N.J.: Erlbaum, 1975.
- Patterson, G. R. A performance theory for coercive family interaction. In R. Cairns (Ed.), *Social interaction: Methods, analysis and illustration*. New York: Halstead Press, 1979.
- Patterson, G. R., & Bechtel, G. G. Formulating the situational environment in relation to states and traits. In R. B. Cattell & D. M. Dreger (Eds.), *Handbook of modern personality theory*. New York: Halstead, 1979.
- Pawlak, K., & Buse, L. Rechnergestützte verhaltensregistrierung im feld: Beschreibung und erste psychometrische überprüfung einer neuen erhebungsmethode. *Zeitschrift für Differentielle und Diagnostische Psychologie*, 1982, 3, 101-118.
- Pervin, L. A. A free-response description approach to the analysis of person-situation interaction. *Journal of Personality and Social Psychology*, 1976, 34, 465-474.
- Powell, B. Uncharacteristic actions. *Mind*, 1959, 68, 492-509.
- Queneau, R. *Exercises in style* (B. Wright Trans.). New York: New Directions, 1981. (Originally published, 1947.)
- Rapaport, D. The structure of psychoanalytic theory: A systematizing attempt. In S. Koch (Ed.), *Psychology: A study of a science*, (Vol. 3). New York: McGraw-Hill, 1959.
- Rips, L. J. Inductive judgements about natural categories. *Journal of Verbal Learning and Verbal Behavior*, 1975, 14, 665-681.
- Rommetveit, R. On "meanings" of acts and what is meant and made known by what is said in a pluralistic social world. In M. Brenner (Ed.), *The structure of action*. New York: St. Martin's Press, 1980.
- Rosch, E. Cognitive reference points. *Cognitive Psychology*, 1975, 7, 532-547. (a)
- Rosch, E. Cognitive representations of semantic categories. *Journal of Experimental Psychology: General*, 1975, 104, 192-233. (b)
- Rosch, E. Principles of categorization. In E. Rosch & B. B. Lloyd (Eds.), *Cognition and categorization*. Hillsdale, N.J.: Erlbaum, 1978.
- Rosch, E., & Mervis, C. B. Family resemblances: Studies in the internal structure of categories. *Cognitive Psychology*, 1975, 7, 573-605.
- Rosch, E., Mervis, C. B., Gray, W. D., Johnson, D. M., & Boyes-Braem, P. Basic objects in natural categories. *Cognitive Psychology*, 1976, 8, 382-439.
- Rosch, E., Simpson, C., & Miller, R. S. Structural bases of typicality effects. *Journal of Experimental Psychology: Human Perception and Performance*, 1976, 2, 491-502.
- Russell, J. A. Affective space is bipolar. *Journal of Personality and Social Psychology*, 1979, 37, 345-356.
- Ryle, G. *The concept of mind*. New York: Barnes & Noble, 1949.
- Sarbin, T. R., & Allen, V. L. Role theory. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (Vol. 1, 2nd ed.). Reading, Mass.: Addison-Wesley, 1968.
- Skinner, B. F. *The behavior of organisms*. New York: Appelton-Century-Crofts, 1938.
- Spearman, C. "General intelligence" objectively determined and measured. *American Journal of Psychology*, 1904, 15, 201-293.
- Squires, R. Are dispositions causes? *Analysis*, 1968, 29, 45-47.
- Squires, R. Are dispositions lost causes? *Analysis*, 1970, 31, 15-18.
- Sjoberg, L. Life situations and episodes as a basis for situational influence on action. In D. Magnusson (Ed.), *Toward a psychology of situations: An interactional perspective*. Hillsdale, N.J.: Erlbaum, 1981.
- Tuomela, R. (Ed.). *Dispositions*. Boston, Mass.: D. Reidel, 1978.
- White, G. M. Conceptual universals in interpersonal language. *American Anthropologist*, 1980, 82, 759-781.
- Wiggins, J. S. *Personality and prediction: Principles of personality assessment*. Reading, Mass.: Addison-Wesley, 1973.
- Wiggins, J. S. A psychological taxonomy of trait descriptive terms: I. The interpersonal domain. *Journal of Personality and Social Psychology*, 1979, 37, 395-412.
- Wiggins, J. S. Circumplex models of interpersonal behavior. In L. Wheeler (Ed.), *Review of personality and social psychology* (Vol. 1). Beverly Hills, Calif.: Sage, 1980.
- Wiggins, J. S. Clinical and statistical prediction: Where are we and where do we go from here? *Clinical Psychology Review*, 1981, 1, 3-18.
- Zadeh, L. A., Fu, K. S., Tanaka, K., & Shimura (Eds.). *Fuzzy sets and their applications to cognitive and decision processes*. New York: Academic Press, 1975.

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