# Creating and Criticizing Theory

LINDA S. GOTTFREDSON

*Center for Social Organization of Schools, Johns Hopkins University*

F. W. Vondracek, R. M. Lerner, and J. E. Schulenberg (*Journal of Vocational Behavior*, 1983, **23**, 179–202) criticize the vocational literature for failing to "follow acceptable scientific procedures for building a theory" and for failing to attend to important methodological and substantive developments. It is argued here that no single acceptable process for creating theory exists and three strategies useful for developing a theory are illustrated: immerse yourself in data, pick a specific set of results to explain, and try to resolve inconsistencies in the literature. Three criteria for evaluating theories and criticisms of them are discussed: comprehensiveness (content value), accuracy (truth value), and clarity (form). The paper by Vondracek et al. is examined from this perspective and is shown to lack the specificity, clarity, and accuracy necessary to be an effective guide to better vocational research or theory.

I welcome the invitation to comment on the paper by Vondracek, Lerner, and Schulenberg (1983) because it provides an opportunity to discuss a topic of importance—improving vocational theory and research. From my experience as researcher, theorist, and critic, I have distilled some helpful principles for creating and constructively criticizing theory. I shall use these to structure my comments. Vondracek et al. criticize selected examples of current theories for failing to "follow acceptable scientific procedures for building a theory" (p. 180), for failing to attend to advances in the measurement of change and to "theoretical advances and empirical data bases within the developmental literature" (p. 182), and for showing an "apparent disregard for well-established empirical findings" (p. 183). They then argue for the adoption of a "dynamic interactionist" perspective which focuses on the "multi-dimensional, plastic, contextual, and life-span features of development."

## THE CREATION AND EVOLUTION OF THEORY

The term theory *building* is not a good metaphor for theory development because it suggests blueprints, set procedures, and orderly progression.

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Producing a theory is a creative process during which the author brings his or her organized conclusions about the nature or origin of some phenomenon to temporary closure to produce a statement that others can consider and test. The author usually knows that this provisional structure is incomplete and expects that portions will probably fail when tested. Successive revisions of a theory are not necessarily additions like new wings on a building, but may instead be reorganizations much as successive stages of human development are often conceptualized as reorganizations. I shall refer to my experiences to illustrate three strategies that have been especially helpful to me.

*Immerse yourself in data.* Scientific intuition is rooted in experience with the empirical world. Einstein (reproduced in Wallace, 1971, pp. 50–51) noted that this intuition is based on "an intellectual love . . . of the objects of experience." Because one's personal experience through research or observation is limited, this often boils down to doing a lot of critical reading in addition to any research one conducts. Old data can yield valuable clues to a new theoretical outlook, so a fresh look at old studies can be worthwhile. One should avoid relying on another person's interpretation of results which are central to one's topic of interest because those results, and even the description of the study itself, may contain important information that either was misinterpreted or was not discussed because it went unnoticed or was not relevant to the original author's purposes. The person prepared by extensive experience is also more likely to spot previously unrecognized regularities in old data, to successfully discriminate between findings that are robust and those not, and to discover clues among the casual remarks and peripheral observations of others. The search through existing data should be an increasingly strategic one facilitated by a familiarity with previous theories and by a grasp of the limitations of different kinds of data and procedures. For example, my theory of the development of occupational aspirations (Gottfredson, 1981) began with some intuitions based on my familiarity with psychological and sociological studies of occupations and careers. But it was only through scrutinizing several hundred studies in a variety of relevant subfields that the patterns of development which I describe in my theory began to emerge (such as the sequence in which gender, social class, ability, and vocational interests become criteria for evaluating jobs and self and for circumscribing one's aspirations). At that point I could look for very specific types of studies to test or amplify my speculations.

*Pick one or more specific patterns of results to explain.* I did not set out to explain how youngsters develop occupational aspirations, which is a general and abstract issue, but to explain how the well-documented differences in aspirations by social group (e.g., race, sex, social class) develop. These differences are considered important but are not the object of explanation in other theories of vocational choice (e.g., Holland, 1973). To explain a specific empirical pattern while on the way to a more general theory, to have a target one must hit, is not at all easy and it forces the grounding of theory in evidence.

*Try to resolve inconsistencies, anomolies, puzzling results, and incompatible points of view.* The search for regularity or patterns of change is obviously central to creating theory. But persistent inconsistencies and puzzling results are likely to hold clues to our theoretical inadequacies (cf. Merton, 1957, p. 103, on serendipity). Two questions that impelled me were (a) why do certain groups of people differ dramatically in the jobs they want even though they are remarkably similar in the jobs they consider most generally desirable? and (b) why is job satisfaction related so weakly to congruence between the field of work one gets and the field one wants (a thoroughly documented finding that violates the fundamental assumption of much vocational theory)?

One concrete example of a body of contradictory evidence is that concerning whether sex stereotyping becomes stronger or weaker with age. An examination of the items, response options, and the ages of respondents reveals that different cognitive processes and aspects of sex stereotypes were probably being tapped by the different studies. The final resolution to the contradiction seems to be that as youngsters get older they associate more attributes with one sex rather than the other (because they become aware of more subtle aspects of sex roles), but they are less likely to rate any particular attribute as exclusively male or female (because they are able to make finer distinctions, Gottfredson, 1981, pp. 559–560). Not only is a resolution of this contradiction central to the integrity of any theory of sex differences in aspirations, but it also provided unanticipated evidence supporting speculations about the role of cognitive development in the development of aspirations.

Inconsistent or puzzling results need not seem important in their own right to indicate underlying theoretical inadequacies (e.g., see Gottfredson, 1981, p. 573, on the lower predictive validity of interest inventories versus expressed aspirations). Resolutions of these discrepancies may sometimes come from a direct and concerted attack, but often they must dwell at the back of the mind until a theorist discovers a potential solution while pursuing another topic. The oft-noted value of interdisciplinary work stems in large part from the theoretical reorganization and clearer specification of concepts which are necessary to account simultaneously for the different types of data two fields typically produce on the same topic.

## EVALUATING THE USEFULNESS OF A THEORY

No single set of "acceptable scientific procedures for building a theory" exists. Producing a good theory is usually hard investigative work using less than optimal data, and it is the antithesis of sloppy thinking, lazy

reading, or unconstrained philosophizing. Although the value of a theory can vary considerably depending on the specific application, the following three criteria can be used to determine the overall usefulness of a theory.

*Comprehensiveness (content value).* Theories can be characterized by the breadth of their content (the range of topics included) as well as their explanatory depth (the number and specificity of hypotheses about any one phenomenon). Because our resources are limited, there are tradeoffs between depth and breadth, and arguments for middle-range theories (Merton, 1957, p. 5) are essentially recommendations concerning the optimal compromise. Vondracek et al. seem concerned primarily with breadth of coverage because in presenting their "dynamic interactionist" perspective they stress that vocational development should be approached as a life-span process involving many variables, multiple directions in development, mutual influence of person and context, and an everchanging environment. They criticize specific theories as well as the field in general for excluding some of these aspects of development. As some philosophers of science point out, the pursuit of such grand theory shows much ambition but little promise—developing and integrating middle-range theories proves more productive (Merton, 1957, p. 6), as Vondracek et al. themselves acknowledge (p. 190). Rather than pointing out the myriad things our theories do not cover, it appears more useful to assess whether a theory does what it claims to do and to compare it to other work on the same topic in order to show where we stand in our progress toward better understanding. Then it is helpful to argue for specific and realistic *priorities* for where we should go from there. After all, it is hard to name ten variables that are *not* associated with vocational development and adjustment in some way.

Different vocational theories make different contributions. Although not developmental in the usual sense of describing the typical succession of developmental events, the person–environment interaction theories (e.g., Holland, 1973; Lofquist & Dawis, 1969) deal explicitly with some of the engines of personal change and stability at any age. Super (1963) focuses on commonalities in how people face vocational tasks throughout life (growth, exploration, establishment, etc.). Life cycle approaches in sociology (e.g., Duncan, Featherman, & Duncan, 1972) focus on systematic differences in education, occupational prestige, and income as they are related to attributes of both persons (e.g., intelligence) and their environments (e.g., family size or social class). Others (e.g., Gottfredson, 1981) attempt to weave together both the commonalities and divergencies in development. All these theories are restricted in scope, but they are all useful for specific purposes and they continue to grow as their authors resolve old problems and address new ones.

Vondracek et al. also fault the explanatory depth of two current theories by repeating the criticism commonly applied to some stage theories: they

depict "stages unfolding by themselves, as if led by a teleological agent" (p. 182). Their specific example (p. 182–183) is that my theory, while it does "make reference" to social class, pays "little attention . . . to describing or explaining how such contextual variables mark *processes* linking the person to his or her context." These statements are misleading because the theory provides the most systematic explanation to date of how social class affects aspirations. The theory postulates that youngsters develop more subtle and abstract conceptions of self, occupations, and society as they increase in mental age. Because gender, social class and intelligence, and personal interests reflect progressively less concrete and observable attributes of self, youngsters orient first to sex roles (early in elementary school), then to social class and intelligence (later in elementary school), and finally to personal interests (usually during high school) for defining self. The *capacity* to understand self and society may be characterized as unfolding, but youngsters' self definitions and occupational preferences cannot because they are strongly influenced by the demands and opportunities in their particular environments. For example, the theory describes how the floor of expectations parents have for their children (i.e., the lowest-level occupation that is acceptable to them) is higher in higher socioeconomic status families and it describes how people moderate their expectations depending on the general ability level of the child. As youngsters become able to perceive and comprehend such expectations, they rule out occupational aspirations that are inconsistent with their developing sense of who they are in society.

*Accuracy (truth value).* We place more faith in a theory when a greater proportion of its hypotheses are consistent with known facts and when new facts do not contradict its propositions. A theory's usefulness also depends on the possibility of even being able to make those determinations, that is, upon the extent to which a theory's concepts can be linked to empirical observations—its testability.

Illustrations by Vondracek et al. (p. 183) of the "apparent disregard for well-established empirical findings" by theorists can be considered as a concern with truth value. Although it would be useful to have any such failures cataloged (systematic ignorance or misrepresentation perhaps even casting an entire theory in doubt), their examples illustrate only their own misrepresentations. Vondracek et al. report (p. 183) that I indicated that children do not achieve object constancy by age 3 to 5. However, they have confused object *constancy* or identity (knowing that one cannot change sex by changing clothes being the example in my article, p. 559; see also Kohlberg, 1966, p. 95, on gender constancy) with object *permanence* (e.g., knowing that a toy hidden from view still exists), which is an understanding of objects that does develop earlier (Langer, 1969, pp. 124, 139). Vondracek et al. (p. 183) also report that I claim that it is not until ages 6 to 8 that "gender is used as an element in the

perception of others" which, they note, is incorrect because earlier reviews (e.g., Kohlberg, 1966, p. 94) indicate that this generally occurs by age 4. However, in the extended discussion (p. 559) in which I referred to the same Kohlberg article, I made it clear that being able to accurately label self and others by gender develops in the preschool years, whereas an understanding of sex *roles* (the patterns of behaviors associated with gender) is more likely to appear during the early elementary years. To dispute my claim that young children have fairly positive views of all occupations of which they are aware, they state (p. 183) that "considerable data indicate that by six to eight years of age . . . both males and females have negative appraisals of traditional female vocations." The four studies they cite (including one coauthored by Lerner himself and one of children older than 6 to 8) show only that girls and boys prefer different occupations and that they find different occupations (and fewer for females) suitable for the two sexes. This finding is consistent with *either* positive or negative appraisals of traditional jobs. Furthermore, my article (p. 550) summarizes studies showing that first graders tend to rate all occupations favorably, that fourth graders are harsher judges of occupations, that eighth graders perceive the same prestige hierarchy that adults do, and that adults tend to rate jobs held by their own sex more favorably than does the other sex. That discussion also invalidates their complaint that "Gottfredson . . . does not tell us the age range she has in mind when she refers to a 'young child' " (p. 183).

Vondracek et al. (p. 181) are also concerned about the lack of awareness Knefelkamp and Slepitza (1976) and I show about "the existence of rather rigorous criteria for the establishment of universalistic, developmental stage theory." This can be conceived as a concern with the criteria necessary for establishing the validity or accuracy of a particular type of theory. I recognized typical stage theory issues by arguing in my article (pp. 555–557) that the processes my stages reveal are not typically reversed, that the stages overlap in certain respects, that progression depends upon mental rather than chronological age, and so on. However, there is no wisdom in a theorist mechanically testing a new theory against criteria developed for another. They cite Brainerd (1978) who faults Piaget for failing to meet his own stage criteria, but in the several dozen commentaries published with Brainerd's article there is considerable disagreement among developmental psychologists themselves not only about whether Piaget meets those criteria, but also whether the different criteria are even relevant or useful to Piaget's or any other theory. Furthermore, my stages are not intended to represent hypothetical constructs as might those of Piaget (1970), but rather they are a means of organizing the discussion of developmental events addressed by the theory. Nor does the theory require that cognitive development conform to a discontinuous model (i.e., a stage model) of development. My theory postulates only

that youngsters increase in mental age, though not necessarily at the same rate nor to the same eventual level.

*Clarity (form).* Clarity refers to selecting the best form in which to communicate a theory to potential users. The specific form is not as important as is using a form that is suitable for the theory's state of development. Formalization (e.g., algebraic representation of propositions) should be introduced to clarify or provide additional content rather than to glamorize. Major concepts should be carefully and consistently used if not explicitly defined or concretely illustrated as well. Discussing how one's concepts resemble, differ from, or subsume similar concepts in the literature helps to avoid confusion. Diagrams can sometimes help clarify complex concepts or processes; for example, Holland's (1973) hexagon shows the systematic relations among his six types of vocational interests and helps to illustrate his concepts of consistency and congruence. The popularity of Holland's theory is no doubt due in part to its clear and concise explication as well as to its value in organizing information about people and jobs and to its accompanying techniques for operationalizing central concepts for use in research and counseling.

## INFLUENCING RESEARCH AND THEORY THROUGH CONSTRUCTIVE CRITICISM AND EXAMPLE

Influencing research and theory involves more than getting scientists to see the validity of one's special message. It means getting them to change what they actually do. The same criteria can be used to evaluate the persuasiveness of both theory and its criticism. I shall use these criteria to show why the paper by Vondracek et al. is unlikely to make much if any difference, a fate that has met many attempts over the years to guide the field toward more productive work (see Gottfredson, 1982, p. 80).

*Comprehensiveness (content value).* Although being reminded of the "obviously incredible complexity of vocational behavior" (p. 189) is sometimes useful, being given strategies and priorities for examining and organizing this vast and confusing array is usually more beneficial. Vocational psychologists are not oblivious to the context of development, but they report being more interested in some aspects (e.g., characteristics of occupations) than in others (e.g., labor market conditions, see Gottfredson, 1982, p. 76). How should these apparent priorities be shifted, and why? Providing such guidance requires greater depth of argument and specificity of example than Vondracek et al. offer. Although it is almost three decades old, I find the paper by Blau, Gustad, Jessor, Parnes, and Wilcock (1956) more useful because it tries to organize the large number of individual- and societal-level influences on vocational behavior, because it provides more specific and relevant theoretical and empirical documentation of its recommendations to attend to phenomena

such as the compromise process, and because it gives concrete examples of research following from their conceptual framework. Moreover, before vocational psychologists are encouraged to reinvent the wheel, it would be useful to have some systematic reviews of the relevance of the considerable work on related issues in other fields (e.g., labor market structures, employer selection practices, occupational socialization, and changes over time in the labor force participation of women and other groups).

*Accuracy (truth value).* Scientists legitimately differ in their interpretations and evaluations, but it is essential that they be scrupulous in their portrayal of their own data and the work of others. When an idea, statement, or intention is attributed to someone else, that attribution should be faithful and put in context. I have already illustrated a series of incorrect attributions in the paper by Vondracek et al.

*Clarity (form).* Organized argument and straightforward language are helpful, as is the provision of definitions or specific examples to invest meaning in abstract concepts. Vondracek et al. leave us largely on our own, as they also do in their earlier article (Vondracek & Lerner, 1982), to interpret central concepts such as "dynamic interactions" (the "complex, multidirectional relations . . . between an individual and his/her context," p. 187) and to relate them to others such as "relational perspective" ("the 'goodness of fit' between individual and contextual developments," p. 190). Their examples are few and meager (e.g., possible decreases over time in the age of first becoming fertile probably affect the nature and timing of vocational choices, p. 188) or distant from the concerns of vocational psychologists (e.g., social behaviors have helped to perpetuate humanity, p. 187). Their perspective seems to reflect some well-recognized issues in the study of man and society, some of which have been of direct concern to vocational psychologists (e.g., person–environment interactions, developmental patterns, personal adjustment) but others not (e.g., social change, the structures and functions of society, the balance between individual and societal needs). But Vondracek et al. do not make clear what particular "theoretical advances and empirical data bases" (p. 182) vocational scientists have neglected nor do they detail how particular theories or types of research might be improved by utilizing those contributions. Longitudinal research that better disentangles developmental, time of measurement, and cohort effects would indeed be valuable as they suggest (pp. 183, 189), but few vocational scientists may be persuaded to tackle this complex methodological problem until someone points out concrete instances where past conclusions may have been faulty because, to take an example, the youngsters in different studies grew up and entered the labor force under different economic conditions (see Note 1).

As I have already noted, we would profit from more integrative reviews of what is known on a topic as well as what is not (e.g., Elder, 1975,

on age-related issues). Articles that painstakingly marshall evidence to illustrate the need to rectify some particular neglect are not only more effective goads to action but also provide readers with concrete ideas as to how they might begin (e.g., Bronfenbrenner, 1977, on the "ecology of human development"; Brim & Ryff, 1980, on life events). Most admirable and influential of all, finally, are the scientists who perform the difficult tasks they encourage others to undertake (e.g., Nesselroade & Baltes, 1974, who use a sequential longitudinal design to identify cohort versus developmental changes). Nothing inspires like a good example. It would be helpful if we had more of them.

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1. Gottfredson, L. S. *Studying the effects of social change on minority career development*. Paper presented at the annual meeting of the American Psychological Association, Los Angeles, 1981.