Reprinted from: *Developmental Review* (1983) 3, 79–97.

# Social Competence as a Developmental Construct

EVERETT WATERS
*State University of New York*

L. ALAN SROUFE

The concept of social competence presents problems for conceptualization and assessment. At times researchers have tried to circumvent these problems by defining competence in terms of specific capacities or skills, with the consequence that the integrative potential of the concept is lost. On the other hand, more molar definitions (e.g., "effectiveness"), while being true to the integrative nature of the construct, provide little guidance for assessment. In this paper a developmental perspective on competence is presented which is congruent with a molar definition of competence while still guiding assessment efforts. In addition to this developmental viewpoint, certain practical guidelines are presented for assessment of competence across ages. These include the use of broadband assessments, which are tied to real-life adaptational problems, call for the coordination of affect, cognition, and behavior, and tax the integrative capacities of the child. Initial validation of the developmental competence construct and this approach to assessment is presented.

The concept of competence has been important in discussions of motivation (e.g., White, 1959, 1965; Baumrind, 1972), intellect (e.g., McClelland, 1973), behavioral adjustment (e.g., Goldfried & D'Zurilla, 1969), and research with children at risk for psychopathology (e.g., Garmezy, 1974, 1975). Despite (or perhaps because of) its usefulness in so many contexts, the domain of competence has proven difficult to define and the array of traits and skills associated with the concept is now both extensive and difficult to schematize. Our objective in this paper is to bring to bear a developmental perspective on the definitional and assessment issues surrounding this concept in the domain of social behavior.

The term "competence" has been applied in reference to many different domains of behavior. Anderson and Messick (1974) have catalogued 29 diverse referents ranging from specific skills (fine motor dexterity) to abstract concepts such as consolidation of identity.

Basically, there have been two general approaches, one emphasizing competence as a molar concept and the other emphasizing more specific characteristics. Each of these approaches has advantages and problems. The molar definitions are intuitively appealing and seem to be at an appropriate level of abstraction. Competence is viewed as an integrative concept which refers broadly to an *ability to generate and coordinate flexible, adaptive responses to demands and to generate and capitalize on opportunities in the environment (i.e.,* effectiveness). As such, this would elude at least the following: (a) the individual's own contribution to situation or opportunity for response, (b) recognition of opportunity or demand for response, (c) prior acquisition of response alternatives, (d) selection from among response alternatives, (e) motivation to respond, persisting or

This paper was supported by a grant from the National Science Foundation (NSF/BNS1004572).
Send reprint requests to Everett Waters, Department of Psychology. State University of New York, Stony Brook, NY 11790.

changing the response as required, and (g) modulation tuning) or response. Unfortunately, such molar definitions often seem lack specific implications for assessment. How does one begin to me effectiveness — in what situations with what behaviors, using what tasks? By what criterion does one determine an individual's effectiveness — without falling back on specific skills or else embracing a circularity (effectiveness being some predefined "competent" way of functioning?).

On the other hand, defining competence as specific skills (competencies) solves measurement problems at the expense of the construct itself. Specific skills are likely to be highly situation and age specific and likely, therefore, to be very relevant to understanding ongoing individual adaptation. Assessing individuals as competent or incompetent should have implications beyond a specific situation, task, or even age to be very useful in developmental research. In addition, specific skills would be highly related to intelligence or other individual traits, making the concept superfluous.

A developmental perspective is useful for maintaining an integral definition of competence while at the same time generating some direction for measurement. First, formulating a definition of competence that appropriate across age spans immediately points up problems in relying on specific skills; for example, few specific skills are available to both infant and the adolescent. Second, considering the salient issues within each development period provides guidance concerning *what* to measure. This is at the heart of the research we will discuss. Finally, and most important, one can to some extent circumvent the inherent circularity molar definitions with a developmental approach. Competence in one developmental period — effectiveness in drawing upon personal and environmental resources — should have consequences for subsequent development. If a child is being effective in coordinating, organizing, drawing upon resources he or she should be better prepared (by definition) to deal with future challenges and opportunities. One gains confidence in early assessments of competence (and the usefulness of the construct to the extent that they are in fact related to assessments at later developmental periods. The more clear the developmental relationships the more valid the construct. Some circularity remains, and one can never be absolutely certain of the validity of the assessments. This is always the case with construct validation (Cronbach & Meehl, 1955). But the developmental perspective can provide an important heuristic for conducting research on the construct of competence.

Since much of our own research has involved longitudinal study of adaptation from early infancy and now into childhood, a developmentally robust construct was needed. "Competence", if it could be used with equal relevance in descriptions of both infants and children, could be just such a construct.

## DEFINING COMPETENCE AS A CONSTRUCT

*The competent individual is one who is able to make use of environmental and personal resources to achieve a good developmental outcome.* This simple statement is not unlike definitions of competence proposed before, when psychologists have referred to the advantages of possessing a particular skill or ability. As Goldfried and D'Zurilla (1969) have pointed out, the notion of competence as the ability to use resources can be traced in formal statements at least back to Socrates, who viewed competent individuals as: "those who manage well the circumstances which they encounter daily, and who possess judgment which is accurate in meeting occasions as they arise and rarely miss the expedient course of action." This notion has no doubt appealed to common sense for at least as long. The primary contribution that we can offer is to make this same assertion but in the context of a developmental perspective and to add the qualification that adaptation per se is not indicative of competence, as we construe it, unless the adaptation bodes well for, or at least does not foreclose on, developmental change. As just one example, an infant may learn to withdraw from human contact in the face of rejection or abuse (Egeland & Sroufe, 1981; George & Main, 1979), and this may indeed be an adaptive response in terms of survival. But to the extent that such withdrawal forecloses on contact with other adults and with peers it would not be consistent with our criterion of competence.

*Resources within the environment.* By resources within the environment we are not referring primarily to material or negotiable resources. We are more concerned with those things which can support or help develop the ability to coordinate affect, cognition, and behavior in the service of short-term adaptations or longer-term developmental progress. In infancy, adult social partners come to mind; later, attachment figures and whatever in the world of playthings can engage both affect and cognition and enlist them in the service of exploration, play, sharing. etc. From early childhood on, the range of potential resources in the environment expands. It is not clear whether for some children certain of these may at certain times be more important than others.

But it is certain that interaction with individual same-age (and cross-age) peers and eventually integration into the peer group as a whole must loom large among the tasks that make demands on the coordination of affect, cognition, and behavior while at the same time provide a wide range of opportunities to consolidate personal resources and eventually lead to what we have called good developmental outcomes.

For three reasons, the present emphasis is upon taking advantage environmental resources rather than upon quality of the environment se. First, competence is not uniquely associated with what are design enriched environments (e. g., Garmezy, 1974). It is uniquely associated with the ability to coordinate affect, cognition, and behavior in such a way that one contacts and engages a given environment and profits, insofar as possible, from the experience. Second, we emphasize taking advantage because there are very few things that can be unambiguously designated assets, without reference to the needs of an individual. Finally, it seems likely that *individuals* are major determinants of their own environments. We expect that work toward a developmental competence construct facilitate research on this issue.

*Resources within the individual.* The ability to capitalize on resources within the environment often depends upon enlisting resources within the individual. The possibilities here range from specific skills and abilities to general constructs such as self-esteem, and from characteristics which are very environmentally labile to those which are highly stable (general) across environments and age. Some personality and motivational constructs refer primarily to phenotypic or observable characteristics (e.g. Cattell's "surface traits"); others are genotypic, causal, or dynamic constructs that may have a variety of phenotypic manifestations (e.g., Catttell's "source traits"). Some genotypic or dynamic trait constructs have been conceptualized as needs or stable directional influences on behavior (e.g.. Need achievement; McClelland, 1955); others have been more closely tied to the executive functions of a personality system and to the process of adaptation (e.g., Ego resiliency and Ego control (Block &, Block, 1979)). Epstein (1973) has recently proposed that a class of constructs labeled Self, Self-esteem, Self-concept, etc., denotes resources. within the individual, which are more an individual's theory of his actions and abilities than a stable causal trait or executive homunculus.

As with characteristics of the environment, few characteristics of individuals can be related unambiguously to successful adaptation without reference to a particular individual at a particular point in development in the context of a particular set of demands. Indeed, on close inspection from :a developmental point of view, individual differences which are analyzed as assets or liabilities in one context or at one age can be indicators of success or failure in a different context (e. g., dependency in the early months vs in later years). The same variable can be both predictor and criterion, stressor and symptom, at different points in development. Competence as we understand it is not uniquely identified with any particular trait or pattern of personal resources. It is identified with the ability to mobilize and coordinate these resources in such a way that opportunities are created and the potentials or resources in the environment are realized: again, for a good developmental outcome. Therefore, our emphasis is on enlisting and coordinating personal resources rather than on assigning value to high intelligence, social extraversion, or physical stamina per se.

This definitional sketch is quite different than White's (1959) now classic application of a competence construct to the study of resources within the individual. White (1959) introduced a competence concept in order to integrate behavioral and psychodynamic models of motivation and to account for a wide range of data on exploratory behavior which were not comprehended by drive reduction theory. However, he also introduced the concept of competence as an addition to the list of motives which includes hunger, thirst, sex, and other drive states. When used in this sense it might well be included among the resources within the individual.

In our analysis, competence assumes the status of an organizational construct. Competence is not one of the personal resources; this connotation is best captured by notions of self-efficacy, locus of control, mastery, and other concepts derivative of White's contribution. Competence, is identified with the ability to coordinate these resources in pursuit of adaptive goals. It may be that while personal resources are conceptualized in terms of quantitative individual differences, competence may prove to be a more valuable construct when assessed in terms of qualitative individual differences in the coordination of resources.

*Good developmental outcome.* From a developmental perspective the notion of a good outcome needs both proximate and ultimate criteria. Ultimate criteria generally refer to health or adaptation during adulthood. Proximate criteria, which are central to much current research, refer to outcomes that we may want to assess during the course of development.

Proximate criteria are defined in terms of the pivotal issues of specific developmental periods. Good outcome for a given phase of development requires adequate functioning with respect to issues salient for that period and a transition to the next phase with adequate preparation and the resources to succeed there as well. This is the sense in which we want to include the requirement that a good proximate outcome should bode well for or at least not foreclose on subsequent developmental change, Accordingly, we would want to rule out some atypical or neurotic, but in the short term effective, patterns of adaptation as not meeting this test of a good proximate outcome.

## ASSESSMENT OF COMPETENCE WITHIN A DEVELOPMENTAL PERSPECTIVE

Within a developmental approach to the competence construct, the central issue is formulating assessment procedures which are specifically appropriate to each age period and, yet, retain common core features. The general definition presented above, effectiveness in tapping resources, is sufficiently flexible for this task. What remains is to adapt it to each developmental period, as we have done for the early years (Sroufe & Waters, 1977: Sroufe, 1979; Vaughn & Waters. 1981). This can be done by defining each period in terms of its salient issues. What are the central issues or occupying tasks for the 12-month-olds, the toddler. the preschooler? The question then becomes how well is the child doing with respect to these issues? In a general way, what is the quality of the child's adaptation (how able is it to draw upon personal and environmental resources), given the salient issues for the given developmental period?

Before we can collect coherent data on any developmental construct we have to ask two questions: "What develops?" and "What should we measure?" The present construct-oriented approach begins from the premise that the course of human development is a fact, a given. Our task is not to define it but to uncover its outlines, to specify the strategy children in our culture employ to meet an age-old evolutionary problem. A particular set of developmental issues is not presented as an ad hoc answer; it is a hypothesis. If it is the wrong one then it will not be as productive as a better hypothesis that might compete with it or evolve from it. The key here is that models of this type take the question "What develops?" seriously. Moreover, they have proved to be useful tools when we approach the related question "What should we measure?"

### *Age Appropriate Assessment*

The key to age-appropriate assessment of competence is to select issues central for each developmental period. In Table 1 a sequence of issues spanning the early years is outlined (adapted from Sroufe, 1979). A more detailed series could be proposed, but this sketch will serve our purposes here.

These issues are not hurdles associated with one age. They are issues which, to some extent, are involved in every phase of life. For example, the infant is developing its autonomy from the day of birth, and individuation remains a salient issue for adults. Still, it seems appropriate to view issues as relatively more salient at different phases in development. Individuation, for example, is a central issue for the toddler period. Similarly, while babies can interact with other babies, effective peer interaction seems more central for the child's adaptation in the preschool years.

In focusing on attachment in infancy, individuation in the toddler period and effectiveness with peers in the preschool, we are hypothesizing that these represent highly salient issues for the period. The formation of attachment draws upon all of the infant's discriminative and cognitive capacities and its history of affective exchange with the caregiver. The infant that has an effective attachment relationship, one which serves its exploration and mastery of the environment, *is* a competent infant (Ainsworth, Blehar, Waters & Wall, 1978; Sroufe & Waters, 1977); that is, it is able to use the primary resources available in this developmental period to find and meet the challenges and opportunities present in the environment. Likewise, the definition of competence at age 2 centers on drawing upon available resources, but here more resources should be available *within* the child. Since these personal resources are readily at hand, and since they may be elaborated and refined through use, our definition of competence at this age involves trying to master the environment on one's own" first, then flexibly falling back on available adult resources (Matas, Arend, & Sroufe, 1978). Our definition of competence in the preschool period is expanded to

**TABLE 1**
**ISSUES IN EARLY DEVELOPMENT**

| PHASE | AGE (MONTHS) | ISSUE | ROLE FOR CAREGIVER |
|---|---|---|---|
| 1 | 0-3 | Physiological regulation | Smooth routines |
| 2 | 3-6 | Management of tension | Sensitive, cooperative interactions |
| 3 | 6-12 | Establishing an effective attachment relationship | Responsive availability |
| 4 | 12-18 | Exploration and mastery | Secure base |
| 5 | 18-30 | Individuation (autonomy) | Firm support |
| 6 | 30-54 | Management of impulses, sex-role identification, peer relations | Clear roles and values, flexible self-control |

Reprinted with permission from Sroufe (1979).

include the capacity to operate effectively with and draw upon the peer group, which represents both a developmentally appropriate challenge and a resource for further learning and development.

Our working model suggests that assessing competence will require us to measure different behaviors at different ages. The model does not specify exactly which behaviors to measure. The constructs (attachment, autonomy, peer relationships, etc.) toward which our assessments are directed cannot be equated with any single index or behavior. Each presents unique problems for successful assessment and each may require appropriately tailored assessment strategies.

It follows from our dual emphasis on age-appropriate assessment and analysis of functioning with respect to salient developmental issues that constructs like attachment and peer relations should each be conceptualized in their own right, not as a function of immediately preceding developmental issues. Thus, rather than assume that peer relations are similar in kind to attachment relationships or that autonomy is simply attenuation of attachment, we have tried to conceptualize and assess each construct in terms of measures that are most coherent vis a vis the particular developmental issue/ construct at hand. When cross-time relationships are uncovered using this approach one can be confident that they are not due to shared method variance. Confidence in the central construct — competence — is increased.

At the same time, when developing assessments of competence across developmental periods, coordinating the level of analysis that each measure introduces into the study is essential. In our efforts to assess a variety of developmental constructs we have arrived at some generalizations about the *types* of assessment that are often most productive for early longitudinal research. These are offered here as practical suggestions. While they emphasize observational and descriptive modes of analysis, they are not intended to foreclose on the need for process or experimental analyses. We believe a broad-based description of any developmental phenomenon is needed before informed and economical microlevel or process analyses can be designed.

*Invariant Features of Competence Indices*

*1. Broadband versus narrow assessments.* It is desirable to assess a broadly representative range of construct-relevant behaviors, and at the same time it also is desirable to know from a high or low score exactly what a subject has done or is likely to do in the future. Unfortunately, these are not independent features of a measurement technique or device. Broadband assessments inherently forego a degree of specificity. Assessments with high fidelity tend to lack breadth and are situationally specific. At least in the early stages of research on competence, we would argue that is more important to understand broadly the way the child func-

tions (the quality of functioning) than to be able to predict the specific behavioral response. For example, in our toddler problem-solving assessments (Matas et al., 1978), we focus on the enthusiasm, persistence, flexibility, and enjoyment in dealing with the problem, rather than the part of the problem first addressed, the tool used first, or even the time required to solve the problem. We believe our broad assessment of the way the child approaches problems better reflects his, her ability to dry, upon resources and to deal with opportunities and challenges in the environment.

As another example, attachment researchers often have assessed an infant's tendency to stay close to its mother in terms of specific discrete behaviors. Frequently counts of touching the mother, looking at her, crawling toward her, etc., are often selected because they offer high fidelity to researchers who prefer minimal distance between measures and constructs. Unfortunately, at this level behavior proves to be highly situation specific (Waters, 1978). Measures of touching the mother or other discrete behaviors tend not to correlate well across time or situations and they tend not to be correlated with similar assessments of related behavior (e.g., looking at the mother, approaching the mother with toys).

An alternative approach to attachment assessment has involved using broadly defined categories of proximity seeking or contact maintaining behaviors. These subsume a wide variety of behaviors that share the predictable outcome of closer or prolonged infant–mother contact or proximity. This approach explicitly recognizes that multiple behaviors can serve the same function and that the same behavior can serve several functions in various context (Santostefano & Baker, 1972). Not all instances of phenotypically similar behaviors are considered equivalent and no single behavior is equated with the construct or dimension under study.

Assessments at this level have usually been undertaken via rating schemes or behavior scaling techniques. In the latter, narrative records of actual behavior are divided into episodes (context + behavior + consequence) and these are ranked by judges in terms of the response dimension to be assessed. These rank-ordered episodes define a scale which is divided into intervals. Episodes within the same interval are assigned the same score on the dimension being scored. Observers apply the scale by matching subjects' behavior to the most similar episode in the scale and assigning the corresponding scale point. This procedure is more specific as to behavioral referents than a global rating scale.

These and other broadband assessment strategies (e.g., classification schemes, Q-sorts, peer nominations, multiple criterion approaches) have consistently yielded better indications of stability across time and situations than narrower high-fidelity methods. They also have tended to provide better guidance for more detailed follow-up analyses. Thus, insofar as the issue in the early phases of longitudinal research is "What develops?" and insofar as our task is to relate dissimilar behavior domains across age, a careful trade-off in favor of moderate bandwidth at the expense of fidelity will often be strategic. Once the outline of a developmental phenomenon is sketched and promising directions for the study of continuity have been uncovered at this level, we will have laid a good foundation for moves toward higher fidelity and more discriminating measures.

*2. Real behavior* vs *laboratory tasks* (construct validity vs face validity). Does our best advantage lie in naturalistic and ecology-based observation or in the design of specific tasks and in careful specification of a subject's response options? Obviously, there are advantages and costs associated with either strategy. Assessment in less circumscribed and less controlled contexts is difficult to design and often inconvenient to arrange: the range of behavior scored tends to be broad and difficult to define; and comparable assessment across occasions or across subjects is difficult to guarantee. In brief, these are inconvenient and noisy places to collect data.

At the same time, relatively naturalistic settings offer several distinct advantages for studies of a construct like competence. They are not far removed from the world to which we would generalize our findings; they allow us to study the subject's selection from among the widest possible range of response options and to recognize individual styles of response. In addition they have a salience and relevance for the subject that laboratory tasks and settings often lack. These are, of course, generalizations. Laboratory assessments can be designed to tap the domain of competence (the marshalling of resources) more efficiently than a random sample of observational data from the real world, where challenges and opportunities are not always in their most clear form. Any single sample of naturalistic behavior, especially if brief, could be unrepresentative and, paradoxically, less revealing of the child's competence in the "real world" than a strategically designed laboratory assessment, in which a child must cope with a problem that regularly (though rarely) occurs in the natural environment.

What is critical is that any laboratory assessment be anchored against the criterion of competence in the child's environment (contemporaneously, at other points in development, or both). That is, face validity cannot substitute for construct validity. Experience has shown that psychologists are not always good engineers of real-world analogs for use in controlled settings. For example, waiting for an adult to return in order to receive a preferred reward *looks* like it would index the ability to delay gratification. And indeed this behavior may well respond to the same experimental variables as delay of gratification does outside the laboratory. But as Bem and Funder (1978) have demonstrated, it does not offer a powerful means of assessing individual differences. Q-Sort data from nonlaboratory settings indicate that children who wait longest in the laboratory procedure are most often described as obedient, submissive to adults, unoriginal, and not curious. They were not often described as "able to delay gratification"!

The need to validate laboratory assessments against external criteria casts new light on the issue of efficiency. If we cannot be confident that a plausible looking task will index relevant variables, can we afford to generate a variety of tasks for every assessment problem and allow them to compete on the basis of external data? And what direction should we take to improve promising but preliminary versions of task-based assessments? The convenience and precision of laboratory-based measures appear illusory, and the generalizability of more ecologically valid measures seems increasingly important.

Developmentalists interested in social competence will find themselves going into and out of the laboratory. Nonlaboratory assessments often can be made with considerable efficiency (e.g., teacher Q-sorts, peer nominations). Laboratory procedures can be developed which stand in the place of environmentally based assessments. Laboratory assessments need not be unduly narrow and specific in focus: they can tap broad and integrative aspects of functioning. The construct validity of both laboratory and nonlaboratory assessments can be increased by combining performance on several tasks (or from several scores) into a composite score or by relying on profiles rather than absolute scores on single measures. The average or configuration of data from several sources is simply more reliable (and will have a greater range of external correlates) than data from a single source (Block & Block, 1979; Epstein, 1980).

Nonetheless, in early stages of research we would argue that researchers would do well to emphasize real-life assessments or procedures already validated against naturally occurring behavior. Since most task based measures, especially when the focus is on high-fidelity assessment, involve a fairly narrow range of content and involve fairly task specific responses, they tend not to correlate very well with analogous or related tasks. Composites are more reliable than data from either task alone, but they probably average out both error variance and some construct relevant variance that is specific to each task. Thus, they are probably more narrow than either task. This could be overcome of course by employing a battery of composited task-based assessments. But in light of the problems discussed above, it is probably more economical to work first with broader-band assessments. As the outlines of the construct under study become more clear and as developmental trends are sketched in, directions for follow-up research become clearer and we accumulate information that should make the design of high-fidelity laboratory-based assessments easier. At that point the costs and risks of high fidelity assessments tend to decline.

*3. Assessments that emphasize coordination of affect, cognition, and* b*ehavior*. Both behavior categories and global summary type measures can be used to assess constructs that are identified with multiple criteria.

Both allow us to tap the range of skills and motives connoted by our definition of competence at various ages and in various behavioral domains. At the same time both types of assessment present problems. Most assessment situations present us with too many plausibly relevant behaviors to assess and too many ways to aggregate them. It is almost never economical to take a raw empirical approach to this problem, score everything, search for a set of behaviors that works well as a measure and cross-validate in an independent sample. At the same time, global variables such as most observation scales, total scores on a single, general purpose marker behavior, or self/peer ratings present problems of discriminant validity. They almost always have unwanted as well as desirable and necessary correlates and these tend to be difficult to eliminate by either procedural or definitional changes. Thus it would be helpful to have some idea what to look for in a promising behavior-based assessment or what to emphasize in the design of observation/rating-type measures.

In our own work, we have focused our assessments on aspects of early behavior (social attachment, problems solving, peer interaction, and self/behavior relationships) in which the need to *coordi-*

*nate* affect, cognition, and behavior is clearly evident. This strategy has proven useful in limiting our search for workable behavioral measures and in the design of discriminating observation/rating measures. The coordination of affect, cognition, and behavior is closely tied to the problem of generating and coordinating flexible adaptive responses to demands and to an active role in defining opportunities for action. Cognition and behavior are obviously relevant, but in isolation they tend to be undiscriminating vis a vis the competence construct (e.g., they tend to correlate with IQ or with variables like activity level). By including affect, we can define an intersection at which difficult assessment problems are often manageable. Competence is clearly tied to motivation and control and, in situations in which these are salient, affect is often entailed and often arises from either success or failure.

In our attachment assessments, for example, we have found that behavior toward the mother immediately upon reunion after a brief separation offers opportunities to assess competence that simply are unavailable in preseparation behavior. The infant is presented with the problem of affective response to separation, shifting from behavioral separation response to effective reunion behavior, and with moving from attachment toward exploratory behavior and play. Most infants meet these demands with ease and sophistication, but some are less successful. They may find it difficult to mobilize effective approach and contact behaviors, and they may find it difficult to be comforted by contact. They may signal readiness to explore and then find release distressing. Other infants become actively avoidant of the mother when she returns; they do not greet her or they approach only to turn away and engage in superficial manipulation of toys. In either case. infants who do not recover from separation without behavioral disruption also often display anger or aggression toward the pother when she returns, whereas most infants exchange positive greetings with her and engage in what we call "affective sharing" (e.g. look at mother. show a toy and smile (Waters, Wippman, & Sroufe. 1979)) after they return to play.

As we will summarize below, assessments emphasizing affect, as well as cognition and behavior, have proven to be highly effective. Such measures have good stability and a wide range of concurrent and predictive competence-related correlates, and they are substantially independent of IQ, temperament, and other bothersome correlates. We have had similar success with behavior-based assessments of social interaction among pre-school peers in less distressing contexts. Thus, the key here is not assessment under stress but assessment close to situations in which spontaneous affective expression is often integrated into ongoing behavior.

*4. Tax behavioral and integrative/adaptive capacity.* Psychometric measures are often classified as measures of either typical or optimal performance. Typical performance usually involves direct assessment of criterial behaviors in typical settings (i.e., job-relevant behavior assessed on the job). Optimal performance is usually assessed via tasks or items completed in a test situation. In the present case, we have emphasized assessment of relatively unconstrained behavior in ecologically valid settings. However, we have not usually found global summaries of typical performance in these contexts to be as useful as assessments that focus on critical events or transactions. That is, even within the range of typical behavior there are situations or episodes that can be said to challenge or tax the behavioral and integrative capacity of a subject. These include situations such as temperature, postural, or state changes for the neonate, sustained face-to-face interaction for the 4- to 6-month-old, response to separation and reunion and exploration of new environments by 12- to 18-month-olds, coping with problems at the edge of one's abilities for toddlers, maintenance of ongoing social play interactions by 3- to 4-year-olds, and responses to change, success, and failure in ego-invested activities by older children.

Special attention to these types of situations has several advantages. First, it allows us to deploy observation time strategically and economically. Second, demands upon the ability to coordinate affect, cognition, and behavior are often concentrated into situations of this kind. Fortunately, the frequency of these can be increased by fairly unintrusive manipulations and thus makes up for the fact that the frequency of construct-relevant behavior is often lower in typical performance settings than in specially constructed test settings. Fourth, the range of individual differences observed in moderately taxing situations tends to he greater than in uneventful intervals, and, thus, reliability and range restriction problems are reduced by focusing on these situations. Finally. situations that challenge and engage a subject tend to be more

salient and appear to elicit more representative response strategies than formal test situations. Accordingly, emphasis upon just these types of situations can appreciably increase the competence-relevant variance in both behavior-based and observation/rating-based data.

## VALIDATION RESEARCH ON THE DEVELOPMENTAL COMPETENCE CONSTRUCT

Validation of a developmental competence construct involves establishing a network of relationships within and across ages and showing that the assessments are somewhat independent of IQ and traditional temperament variables. Not only must the reliability and short-term stability of any assessment be demonstrated (suggesting some salience for adaptation), but selected contemporaneous correlates must be established, confirming the independent conceptualization of age-appropriate issues. Most crucial, prediction of later quality of adaptation must be confirmed, as required by the criterion of "good developmental outcome." In our research program, assessments at each age period have been shown to have convergent and discriminant validity and to be linked to earlier and/or later development.

### *Attachment and Competence*

Infant–caregiver attachment has been emphasized in our research on the late infancy period for several reasons. Attachment in the 1-year-old has close ties to both affective and cognitive development (Sroufe, 1979) and it rests on all earlier development. Its ties to issues such as exploration and mastery of the environment are conceptually clear. Moreover, a suitable procedure for assessing quality of attachment, as competence, was available.

Ainsworth's laboratory procedure, which involves a series of play, separation, and reunion experiences between infant and caregiver, is well-suited to the study of competence as a developmental construct. The procedure taxes the infant's capacity to cope with novelty and with the cumulative stress of two brief separations. The assessment emphasizes the coordination of affect, cognition, and behavior by focusing on the effectiveness of the relationship in supporting exploration, rather than frequencies of discrete behaviors. Not absolute amount of proximity, for example, but the flexible coordination of proximity and exploration across contexts, which vary in terms of affective arousal, reflects the effectiveness of the relationship. The competent 12-month-old is the infant who can separate from the caregiver to explore novel aspects of the surround when stress is minimal, but seeks contact when distressed, readily derives comfort from this contact, and can thus return to play.

Through its play and exploration, promoted by its effective attachment relationship, this infant is acquiring experiences that will promote positive adaptation in the next developmental period. (The Ainsworth assessment procedure and its underlying rationale are presented in detail by Ainsworth et al. (1978) and by Sroufe & Waters (1977).)

In addition to the logic for this assessment, Ainsworth had provided considerable validation. Quality of attachment assessed in the laboratory correlated with exploratory behavior in the home (Ainsworth. *et al.,* 1978). Moreover, individual differences in attachment as 12 months were predicted by mother–infant interaction behavior as early as 6– 15 weeks of life (Blehar, Lieberman, & Ainsworth, 1977), and were predictive of play behavior at age 2 years (Main, 1977).

In our work we first showed that Ainsworth assessments of patterns of attachment behavior were highly reliable at both 12 and 18 months (inter-coder agreement for Ainsworth's three major categories averaging .90 in three studies including more than 300 infants). We also showed that with a middle class sample patterns of attachment were highly stable across the 12- to 18-month period (Waters, 1978). Despite developmental changes in expression, infants assessed as having effective attachment relationships at 12 months (Group B) were independently assessed as similarly competent at 18 months (31 of 32 cases). They may have cried less and made greater use of distance interaction over physical contact seeking, but the organization of attachment behavior was the same. At each age they used the caregiver as a base for mastering the environment. Infants who were unable to explore freely in the caregiver's presence or unable to be comforted when distressed (Group C) showed a similar pattern at 18 months (9 of 9 cases). And infants who separated readily but who avoided contact with the caregiver on reunion, especially with the increased stress of a second separation (Group A), showed similarly avoidant behavior at 18 months (8 of 9 cases).

In addition to the reliability and stability data, we have also replicated Ainsworth's prediction of patterns of attachment from maternal sensitivity at 6 months (with Egeland & Vaughn, unpublished), have shown contemporary affective correlates

(Waters et al., 1979), and have demonstrated a link between attachment and developmental outcome in four studies (Arend, Gove, & Sroufe, 1979; Matas et al., 1978; Sroufe, 1982: Waters et al., 1979).

*Competence in Toddlers*

In developing a comparable competence assessment for the toddler period we elected to use a tool-using, problem-solving situation. Some of the problems were readily solved. Others were well beyond the capacity of the 2-year-old (such as weighting down a lever with a block to get candy out of a box), but the child's mother was available for assistance.

Thus, like the Ainsworth paradigm, this situation taxed the child's cognitive and motivational capacity, and its capacity for drawing upon personal and environmental resources. Moreover, such a paradigm seemed likely to tap issues salient for the 2-year-old (see above) and to call for the coordination of affect, cognition, and behavior. By focusing on affective involvement, enthusiasm, persistence, ability to use adult resources, frustration, aggression, and other aspects of problem-solving style, rather than success or failure per se (which would be directly influenced by maternal input and by DQ), it was felt that the quality of adaptation (competence) could be captured in this situation.

In addition to establishing that enthusiasm, time-on-task, compliance with suggestions, and ignoring could be reliably coded, we also showed these variables to load on a principal factor, which reasonably could be labeled "competence," and to be orthogonal to DQ and temperament factors. Groups of 2-year-olds, assessed at 18 months as having (n = 23) or not having (n = 25) an effective attachment relationship, were strongly discriminated by this factor in the expected direction. DQ did not significantly discriminate the groups. Thus, quality of attachment (competence) significantly predicted effective problem-solving behavior (competence) when DQ did not. Moreover, while children with effective attachment relationship were more compliant in the tool-using tasks, when they were using the caregiver as a resource, they were equally negativistic when asked to stop playing with toys during a free play period. We were not merely tapping a temperamental compliance trait, but effectiveness in a problem-solving situation. Further confirmation that the domain of competence truly was being tapped comes from the power of these assessments to predict adaptation 3 years later (discussed below).

*Competence in the Preschool years*

We have used a number of converging procedures to define competence in the preschool years: detailed behavioral observation, teacher rankings, paired-comparison sociometrics, and laboratory tasks (Arend et al., 1979; Sroufe, 1982; Vaughn & Waters, 1981; Waters et al., 1979). Much of this drew upon the work of Block and Block (1979) with the construct of ego resiliency. This construct, which refers to flexibility in managing impulses and desires in engaging problems and opportunities in the environment, is closely related to our notion of competence. They have developed an extensive laboratory battery and a Q-sort technique to assess individual differences with respect to these constructs. In applying the Q-sort technique, observers highly familiar with the children sort a series of statements into piles according to how like or unlike the given child they are. The Blocks have shown that how closely a child resembles ideal sorts on ego resilience: over-control or under-control is stable over time from age 3½ to 7 years. The laboratory assessments were also stable, and Q-sort and lab assessments of the same construct are correlated. Clearly, these are broadband assessment techniques aimed at the overall quality of the child's functioning. In two studies we have shown that attachment assessments in infancy predict assessments of ego resiliency at ages 4–5 years (Arend et al., 1979: Sroufe, 1982).

We have not been surprised that assessments of preschool social competence have been strongly related to our attachment assessments at 12 and 18 months (Sroufe, 1982; Waters et al., 1979). And, indeed, children found to be socially competent were also judged by teachers to be more empathic and independently were more frequently observed to initiate and respond to others with positive affect, as well as to use positive affect to sustain ongoing interactions. They less frequently responded to others with negative affect. And generally, they were rated to be more affectively expressive (Sroufe, 1982; Sroufe, Schork, Motti & Lawroski, 1981). In more descriptive terms, children judged by three teachers (rankings composited) to be more socially competent were seen to attract other children, to positively engage and/or respond to them, to have an appropriate sense of timing, such that modifications in or changes of activities were suggested when needed, and their suggestions were accompanied by a contagious interest and enthusiasm that helped make the activity fun for everyone. Considerable coordination and integration are required for this kind of functioning, comparable,

though advanced developmentally, to that shown by the infant with an effective attachment relationship.

## CONCLUSION

Construct validation is an incremental process; confidence in a construct is gained as the surrounding network of relationships is expanded. Each cross-age, cross-situation relationship presented above supports the validity of both particular assessment procedures involved and, at the same time, supports the validity of the developmental competence construct itself. When the entire body of relationships is examined, validity of the competence construct, as defined, is especially impressive. A developmental perspective made an important contribution to this process.

The assessments described above had considerable power. Should they, therefore, be considered indices, as the measures of competence for each age? We do not construe them as operationally defining competence, but as assessment procedures which tap the domain of competence. The type of construct we have in mind cannot really be indexed; it is not a quantitative concept. But it is increasingly clear that when theory and assessment are closely coordinated, data on social development can be strikingly coherent across age, situations, and behavioral domains.

## REFERENCES


Ainsworth. M.. Blehar. M.. Waters, E., & Wall. *S. Patterns of attachment.* Hillsdale. N.J., Erlbaum. 1978.

Anderson, S.. & Messick. S. Social competency in young children. *Developmental Psychology,* 1974, 10, 282-293.

Arend. R., Gove. F., & Sroufe, L. Continuity of individual adaptation from infancy to kindergarten: A predictive study of ego-resiliency and curiosity in preschoolers. *Child Development.* 1979. 50, 950–959.

Baumrind, D. The development of instrumental competence through socialization: Focus on girls. In A. Pick (Ed.), *Minnesota Symposium on Child Psychology* (Vol. 6). Minneapolis: Univ. of Minnesota Press, 1972.

Bern, D., & Funder, D. Predicting more of the people more of the time: Assessing the personality of situations. *Psychological Review,* 1978, 85, 485–501.

Blehar, M., Lieberman. A., & Ainsworth, M. Early face-to-face interaction and its relation to later infant—mother attachment. *Child Development,* 1977, 48, 182— 194.

Block, J., & Block, J. H. The role of ego-control and ego-resiliency in the organization of behavior. In W. Collins (Ed.), *Minnesota Symposium on Child Psychology* (Vol. *13).* Hillsdale, N.J.: Erlbaum, 1979.

Cronbach, J., & Meehl, P. Construct validity in psychological tests. *Psychological Bulletin,* 1955, 52, 281—302.

Egeland, B., & Sroufe, L. A. Attachment and early maltreatment. *Child Development,* 1981, 52, 44—52.

Epstein, S. The self concept revisited, or a theory of a theory. *American Psychologist,* 1973, 28, 404—416.

Epstein, S. The stability of behavior. II. Implications for psychological research. *American Psychologist,* 1980, 35, 790—806.

Garmezy, N. Competence and adaptation in adult schizophrenic patients and children at risk. In S. Dean (Ed.), *Prize lectures in schizophrenia: The first ten Dean awards.* New York: MSS Information Corp., 1974.

Garmezy. N. Children at risk: The search for the antecedents of schizophrenia. Part I.

Conceptual models and research methods. *Schizophrenia Bulletin,* 1975.

George, C., & Main, M. Social interactions of young abused children: Approach, avoidance and aggression. *Child Development,* 1979, 50, 306—318.

Goldfried, M. & D'Zurilla, T. A behavioral-analytic model for assessing competence. In C. Spielberger (Ed.), *Current topics in clinical and community psychology (Vol.* I). New York: Academic Press, 1969.

Main, M. Sicherheit und Wissen. In K. E. Grossman (Ed.), *Entwinklung der Lernfahigkeit in der sozialen Umwelt.* Munich: Kinder Verlag, 1977.

Matas, L., Arend, R., & Sroufe. L. Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. *Child Development.* 1978, 49, 547—556.

McClelland, D. Some consequences of achievement motivation. In M. Jones (Ed.), *Nebraska Symposium on Motivation* (Vol. 3). Lincoln: Univ. of Nebraska Press, 1955. McClelland, D. Testing for competence rather than for "intelligence." *American Psychologist,* 1973, 28, 1—14.

Santostefano, S., & Baker, A. The contribution of developmental psychology. In B. Wolman (Ed.), *Manual of child psychopathology.* New York: McGraw—Hill, 1972. Sroufe. L. The coherence of individual development: Early care, attachment, and subsequent developmental issues. *American Psychologist,* 1979. 34, 834–841.

Sroufe. L. Infant -caregiver attachment and patterns of adaptation in preschool: The roots of maladaptation and competence. In M. Perlmutter (Ed.). M*innesota Symposium in Child Psychology* (Vol. *16).* Hillsdale. N.J.: Erlbaum, 1982.

Sroufe, L.A., Schork. E., Motti. E.. & Lawroski, N. The role of affect in social competence. In C. Izard, J. Kagan, and R. Zajonc (Eds.), *Emotion, Cognition and Behavior,* 1981.

Sroufe. L.. & Waters, E. Attachment as an organizational construct. *Child Development,* 1977. 48. 1184— 1199.

Vaughn. B.. & Waters, E. Attention structure, sociometric status, and dominance: Interrelations, behavioral correlates and relationships to social competence. *Developmental Psychology,* 1981, 17, 275—288.

Waters. E. The reliability and stability of individual differences In infant—mother attachment. *Child Development.* 1978, 49, 483—494.

Waters, E., Wippman. J., & Sroufe, L. Attachment, positive affect, and competence in the peer group: Two studies in construct validation. *Child Development,* 1979, 50, 821-829.

White. R. Motivation reconsidered: The concept of competence. *Psychological Review,* 1959, 66, 297-333.

White, R. The experience of efficacy in schizophrenia. *Psychiatry,* 1965, 28, 199-211.