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Assessment of Ecological Factors as an Integral Part of Academic and Mental Health Consultation

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The assessment of ecological factors that affect individual mental health or academic functioning is an important component of educational and psychological consultation. Researchers and practitioners have conceptualized such ecological or environmental factors in a variety of ways and from a broad range of perspectives. In this article we identify and describe important components of a student's environment that affect both instruction and mental health. The integration of these components into present educational and psychological assessments is discussed in light of available research. We conclude by highlighting specific needs for further research and development in ecological assessment, including expansion and improvement of assessment methods, improvement of available instrumentation, and increased attention toward effective implementation.

The process of consultation involves professionals collaborating to use information to plan academic or behavioral treatments. In this article we describe a part of that process: the assessment of school and classroom ecology, sometimes called “instructional environments” or “mental health environments.” We believe it is important for those involved in consultation to think of the concept of the total learning environment and to think broadly about the

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multiple contexts in which learning takes place. Drawing from the seminal work of Bronfenbrenner (1979) we conceptualize environment broadly as school, home, and school-home contexts (cf. Ysseldyke & Christenson, 1993, 2002); the instructional environment as including components like instructional match; and the mental health environment as including components such as school climate and interpersonal relationships. The components are not separate. Although children and youth learn in many contexts—or microsystems—home and school contexts are primary. In two separate chapters (Salvia, Ysseldyke, & Bolt, 2010; Ysseldyke & Burns, 2009) we have provided a relatively in-depth analysis of assessment of instructional environments. Thus, in this article our focus is on providing a broad perspective on ecological assessment, consisting of an overview of assessment of academic environments, and a more in-depth focus on mental health components and their assessment. We conclude with an analysis of the directions we believe ecological assessment will and should go in the near future.

Schooling and the practice of consultation are all about competence enhancement and capacity building (Ysseldyke, Burns, & Rosenfield, 2009). If we are to build students’ competence or build capacity we have to know where we are headed. This requires specification of goals, objectives, standards, results, or intended outcomes for individuals and/or systems. As professionals talk about attainment of goals or standards they most often think of such attainment as resulting from a complex interaction of multiple factors. Historically the discussion has been about ways in which individuals interact with tasks (curriculum or methods) to produce outcomes, or the three-way interaction of assessment, instruction, and curriculum. Others (e.g., Ysseldyke & Algozzine, 2006) have described variations in interactions between student characteristics, teacher characteristics, instructional settings, instructional content, and instructional strategies to produce results or outcomes. Still others (e.g., Carroll, 1963; Walberg, 1980) have focused on instructional factors that make a difference in instructional outcomes.

HOW EDUCATORS AND PSYCHOLOGISTS HAVE THOUGHT ABOUT ECOLOGICAL FACTORS

In the context of applied educational psychology, the concept of ecology encompasses all external factors that might somehow affect students’ educational or mental health outcomes. Researchers have identified and studied a wide variety of ecological factors. Some focus on the ecology of the classroom. There are many studies examining characteristics of classroom environments and how they interact with behavioral and academic performance: physical aspects of the environment like seating arrangements (Wannarka & Ruhl, 2008), instructional arrangements (Ysseldyke, Thurlow, Christenson, & McVicar, 1988), or how learning varies by time of day (Muyskens & Ys-
Assessment of Ecological Factors

Seldyke, 1998). School climate is often identified by educators as an important ecological factor. Hoy and Hannum (1997) found that indicators of school climate consisting of teacher perception of interpersonal relationships and support were positively related to academic outcomes and predicted achievement in reading, math, and writing. Other researchers have found school climate to be an important factor for the prevention and treatment of emotional and behavioral problems (Silver, Measelle, Armstrong, & Essex, 2005).

Others identify the nature and quality of instruction as an important ecological factor by attempting to account for and/or measure the extent to which effective instruction is occurring. Several models of effective instruction have been created over the years (e.g., Carroll, 1963; Walberg, 1980). Ysseldyke and Christenson (1993) conducted a comprehensive review of research on effective instruction and identified a set of evidence-based practices. Based on these summaries, syntheses, and/or meta-analyses in specific content areas like reading or math, inventories have been developed to help teachers and consultants assess the degree to which effective instruction is being provided for individual students (Council of Chief State School Officers, 2005; Ysseldyke & Christenson, 1993, 2002).

A few final examples of important ecological factors recognized in the educational setting are curriculum and school organization. Based on teacher concerns about whether the right curriculum is in place, the federal government has funded centers (e.g., the What Works Clearinghouse) to evaluate the effectiveness of specific curricula. Some believe that alternative organizational structures impact teaching, learning, and its outcomes (Rowan, 1990). Popular, and sometimes controversial, topics researched often involve reorganizing academic schedules to maximize the amount of time students spend actively engaged in learning; examples include research on block scheduling (Freeman, 2001), year-round school (McMillen, 2001), school start time (Wahlstrom, 2002), or all-day kindergarten (Elicker & Mathur, 1997).

COMPONENTS OF THE MENTAL HEALTH ENVIRONMENT

Enhancing the development of wellness, social skills, and life competencies is a functional competency identified in the most recent School Psychology: A Blueprint for Training and Practice III (Ysseldyke et al., 2006). It is important for educational consultants and other educational professionals to be aware of the factors that influence the well-being of their students, especially considering the potential that school-based mental health programs have to improve mental well-being (Atkins, Graczyk, Frazier, & Abdul-Adil, 2003). In this section of the article we describe how environmental factors (e.g., school climate, teacher-student relationships, parent-child relationships, peer relationships) impact student behavior and the outcomes of schooling. We
also discuss a number of areas that could be assessed to incorporate an ecological perspective in the promotion of mental well-being of students.

School Climate

School climate is an important factor in an ecological appraisal and can be assessed in a number of ways. For example, teacher reports have been used to approximate ratings of students (Brand, Felner, Seitsinger, Burns, & Bolton, 2008). There is an extensive list of components that can be considered when wanting to improve school climate, with the most relevant to consultation being collaborative decision making, order and discipline, parent involvement, staff dedication to student learning, and student interpersonal relations (Lehr & Christenson, 2002). Due to the many factors involved in the perception of school climate, consultants can first consider helping administrators improve the physical structure of the environment (Lehr & Christenson, 2002). However, educational consultants should ascertain which factors are most in need of improvement in order to use resources in a way that will have the greatest impact on administrators, teachers, and students. Once the relevant factors have been identified, best practices suggest that data be collected in order to make decisions about the effectiveness of interventions and possible changes for improved outcomes.

Teacher-Student Relationships

There is growing evidence that teacher-student relationships have a significant impact on student academic outcomes (Pianta & Stuhlman, 2004) and student well-being (Furrer & Skinner, 2003) over the course of elementary and middle school. For example, teachers who approach students and attempt to learn something not related to school tend to have lower levels of defiant behavior in their classroom (Gregory & Ripski, 2008). Therefore, consultants should, when appropriate, provide students and teachers with the support they need to appreciate the importance of this relationship. This may be particularly important in a school that has low levels of student engagement and high discipline referrals. In fact, the positive results of these practices extend beyond affecting behavior problems to increasing social competence and improving acquisition of language and early reading skills (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Mitchell-Copeland, Denham, & DeMulder, 1997).

Parent-Child Relationships

A number of disorders that emerge later in life are greatly affected by precursors that occur during childhood and adolescence and that can contribute to poor mental health outcomes (Caspi & Moffitt, 2006). For example, parenting
style affects child and adolescent development in a greater, nonfamilial context, including school and community. Specifically, children of authoritative parents often have higher achievement in school than those of authoritarian parents (Spera, 2005). Even when parents perceive themselves as making responsible decisions for their children, the decisions may result in a negative outcome for the children. For example, low-achieving children tend to develop negative self-evaluative beliefs when comparing themselves with high-achieving friends (Altermatt & Pomerantz, 2005). This finding suggests that parents, who may perceive their child’s higher achieving friends as positive role models, may be unaware of the internalizing problems developing for the lower achieving child. Therefore, educational consultants may want to consider communicating with parents of students they believe are at risk for later mental health problems to improve the likelihood of positive outcomes. Record review may provide information on pathways to potentially negative mental health outcomes and good communication with families also helps put these risk factors in context.

Peer Relationships

The peer network is an important component of mental health outcomes and becomes more significant as students reach adolescence as their primary social support shifts from parents to peers (Barry & Wentzel, 2002). Peer relationships allow students the opportunity to be presented with challenges and situations of socialization that are not found in their interactions with adults. Positive peer relationships allow socialization of interpersonal responsibility and concern to develop, and they promote positive social behaviors in one another (Barry & Wentzel, 2002). A consultant should consider assessing students’ peer relationships and coordinate the necessary screening to identify students at risk for later socioemotional difficulties. The assessment of a student’s peer network can also inform the assessment of negative adolescent outcomes such as high levels of aggression, elevated social anxiety, and binge drinking (Blöte & Westenberg, 2007; Hartup, 2005). An ecological perspective is especially important in this case, as a student with a limited number of school friends may only be engaged with them casually at school and be isolated when not at school—emphasizing that an initial screening tool is much more useful if it is accompanied by a follow-up with parents and teachers of students identified as being at risk.

COMPONENTS OF THE INSTRUCTIONAL ENVIRONMENT

Those who engage in ecological consultation typically look at interactions between the learner and aspects of the instructional environment (e.g., cur-
riculum, instruction, home environment, organization, learner). Ysseldyke and Burns (2009) provided detailed information on components including instructional, home, and home-school components. Gravois, Rosenfield, and Gickling (1999) postulated an instructional triangle that includes two-way interactions between the learner, instruction, and the environment. More recently researchers have argued that outcomes are a function of an interaction between five factors (i.e., curriculum, instruction, home environments, the learner, and school organization), each of which is described briefly here (see Ysseldyke & Burns, 2009, for a detailed analysis).

Curriculum
The specific type of curriculum used in the classroom matters. Some curricula are based in evidence and others are not.

Instruction
Ysseldyke and Christenson (1993, 2002) identified and described multiple components of the instructional environment and organized these into instructional planning, managing, delivering and evaluating. Each of the specific components is listed in the Appendix and was defined and described in detail by Ysseldyke and Burns (2009). Planning, for example, requires making decisions about what to teach, how to teach, and communicating realistic expectations to learners.

Home Environment
Ysseldyke and Christenson (2002) argued that the instructional environment includes the home and the home-school partnership. They contended that educational outcomes are enhanced when there is a supportive home environment coupled with a strong partnership between home and school. They identified four home components and six home-school partnership components of effective instruction. For example, instructional outcomes are enhanced when the level of expected performance held by key adults for the student is congruent across home and school and reflects a belief that the student can learn. Within-family variables (e.g., socioeconomic status) are often identified as predictors of parental involvement, yet that view ignores community and school factors that influence parent involvement. For example, teachers who incorporate parent involvement strategies can positively impact parent-child interactions at home (Epstein & Dauber, 1991). Access to community resources can also facilitate parental involvement (Smith et al., 1997).
The Learner

Students do not enter schools as blank slates. Rather, each has strengths and weaknesses in the development of specific skills and/or abilities. Each has specific neurological wiring, a developmental history, nutritional experiences, and so forth that influence outcomes.

School Organization

Instructional outcomes are affected by the ways in which schools are organized. Each school has unique resource allocation, scheduling system, and grouping structures.

THE IMPORTANCE OF ASSESSING INSTRUCTIONAL AND MENTAL HEALTH ENVIRONMENTS

Historically, the primary focus of educational and psychological assessment has been on student characteristics—the identification of deficits, disorders, disabilities, or dysfunctions, whereas behavioral assessment sought to identify problem behaviors and related factors (Ollendick & King, 1999). Recent advances in assessment have incorporated ecological theory to understand the system of influences on student behavior. Clinicians and educators, using an ecological perspective, have abandoned the individual-focused and deficit-oriented outlook and adopted strength-based treatment that addresses the multiple settings and interactions in students' lives (Motes, Melton, Simmons, & Pumariega, 1999; Reschly & Ysseldyke, 2002). Multiple agents of change act to influence the system and these agents must work together smoothly to improve student outcomes.

Collaboration in ecological assessment allows mental health professionals to develop a deeper understanding of the schools while educators learn the principles of mental health treatment (Motes et al., 1999). Working together, clinicians and educators can maximize the services that students receive and their collective impact on the system. To accomplish this goal it is necessary to understand environmental factors that influence behavior and academic achievement (Bowen & Powers, 2005; Ollendick & King, 1999). Therefore, ecological assessments are part of the first step in evidenced-based practices to identify and intervene in causes of poor academic and mental health outcomes (Bowen & Powers, 2005).

PRINCIPLES OF ECOLOGICAL ASSESSMENT

Ecological theorists view a child's behavior as directly related to interactions between factors within their environments (Bronfenbrenner, 1979; Sheridan
J. Ysseldyke et al. & Gutkin, 2000). Ecological interventions often are designed to change interactions between the child, the environment, and/or attitude/expectations of the child (Apter, 1978). The goal of educational and psychological interventions in the ecological perspective is to refine the fit between the child and the environment. Ecological assessments necessarily identify variables in the environment that are sullying child outcomes (Bowen & Powers, 2005). There are three fundamental assumptions to consider when conducting ecological assessments.

Children Are Inseparable From Their Surrounding Environments

A child’s behavior and performance in school are influenced by several systems and ecological assessments are designed to identify factors that positively and negatively affect the child in home, school, and community environments (Smith et al., 1997). Understanding the child’s ecosystem is key to developing successful interventions (Bowen & Powers, 2005) and ecological assessments observe the child in the context of their interactions with the ecosystem (Apter, 1978). Although it is nearly impossible to assess individuals in all of their environments, those who conduct ecological assessments should investigate factors at home (e.g., parenting style), in school (e.g., response to instructional styles), and when possible in the community (e.g., peer behavior during after-school programs; Sheridan & McCurdy, 2005). When ecological assessment data are not collected, educators and psychologists may overlook variables that sustain problem behaviors and existing resources in these environments available to children. This may lead to faulty interventions and wasted time and resources (Bowen & Powers, 2005).

Problems Are Not Viewed as Student Centered

Traditional assessment and intervention strategies have conceptualized the identified problems as residing within the student. Within-student assessments often utilize individualized cognitive, academic, or psychological testing (Sheridan & McCurdy, 2005). The diagnostic labels that these within-student assessments provide may not inform effective intervention by themselves (Apter, 1978). Researchers have shown that problems do not reside only within a student (Shinn, 2005) and that the student-centered view has led to interventions with little to no effect (Burns & Ysseldyke, 2009; Kavale & Forness, 2000).

The ecological orientation views problems as a mismatch between system demands and child behaviors. Ecological assessments are a suitable alternative for traditional assessments in educational and psychological settings (Apter, 1978). Ecological assessments may include record reviews,
interviews, behavioral observations, teacher and parent reports, and the traditional assessment measures (Heron & Heward, 1988; Sheridan & McCurdy, 2005). The use of ecological assessments and interventions has been shown to have a larger effect on student outcomes (Ysseldyke & Burns, 2009) and has been used in education and school-based mental health arenas.

The Ecological Perspective Encourages Collaboration

The ecological perspective allows for the development of programs that cross system lines and discipline boundaries and ecological assessments may involve several members of the child’s ecosystem. Educators must work closely with clinicians, parents, and community resources to allow parents and students to capitalize on the unique services provided by each stakeholder (Motes et al., 1999). Consultation between the mental health and educational system is imperative for successful ecological interventions (Apter, 1978). Collaboration between systems will allow members of the school system to better understand the mental health system while clinicians gain valuable knowledge about the school (Motes et al., 1999). This collaboration will maximize the resources available to the child.

THE HISTORY OF ECOLOGICAL ASSESSMENT

Mental Health

Assessment of the mental health needs of children and adolescents has long been defined as a collaborative process between pediatricians, psychologists, psychiatrists, and social workers who gather information from multiple sources ranging from psychological testing to interviews with the student and family. This working relationship that extends into a number of contexts has been in place since the 1920s. Over time, mental health consultants began not only to provide individualized services to students but also to consider teachers in their efforts to improve student outcomes (Flaherty & Osher, 2007). The setting for the delivery of ecologically grounded services continued to evolve over time, with the school environment identified as the optimal environment for the delivery of mental health services (Pfeiffer & Reddy, 1998). However, the provision of mental health services has traditionally not been a primary focus of school psychological services, although social emotional and mental health problems can have an impact on academics and behavior at school (Adelman & Taylor, 1999). Today, consultants are much more than psychometricians; they have the skills needed to conduct assessments in the form of observations, interviews, or direct consultation.
Instructional or Academic Factors

At the start of the 20th century, educational psychologists focused on studying learning problems under the assumption that because learning was an individual psychological process, problems in learning originate within learners. It was not until midway through the 20th century that those who engaged in sophisticated measurement of psychological variables began to look toward ecological variables to help understand human behavior and functioning. In the 1950s and 1960s, the assessment of instruction as an impactful environmental influence over student learning was receiving increasing interest. Carroll (1963) proposed a model of learning that included a focus on teachers’ behaviors in addition to those of students. Flanders (1963) developed an assessment system that targeted interactions between teachers and students. By the 1980s, much had been learned about characteristics of instructional environments and how teachers could most effectively deliver instruction (Brophy & Good, 1986). Today, educational consultants attempt to measure the effects of the environment in a number of ways but may at times neglect to address certain contextual influences.

CURRENT APPROACHES TO ECOLOGICAL ASSESSMENT

In standardized assessment the circumstances under which data are collected are, to the extent possible, held constant so that test results can be compared across individuals. The goal in ecological assessment, however, is to gain information about interactions between individuals and elements of their environments rather than to generate comparisons. Ecological assessment involves more direct methods and does not require inference about indirectly measured psychological constructs such as personality traits. Because the goal of ecological assessment is to understand patterns as they naturally occur, the methods are less obtrusive and information is often obtained from multiple sources.

In practice, ecological assessment of academic problems focuses on patterns in a student’s instructional history, interactions with peers or teachers, or aspects of the classroom environment that maintain targeted outcomes. Assessment of such patterns typically involves three general methods: record review, interviews, and observations. One aspect of ecological assessment involves making use of relevant and accessible information or records. Existing information can elucidate trends over time or isolate specific settings within which patterns of concern originate. Examples of relevant information include school records detailing attendance history, disciplinary records, or results of prior assessments. Classroom information (homework assignments, tests, teachers’ notes) is often also useful. Extant data can be used to help
identify the times and places that behaviors of interest occur and can highlight other important patterns in the child’s environment.

Reviews of existing data alone are helpful but unlikely to provide enough information to support selection or implementation of effective interventions. For this reason, the use of interviews is also included in ecological assessments. Interviews are often conducted with teachers, parents, or caregivers to learn more about students’ functioning within particular settings and can be used to identify potential explanations or solutions for targeted problems. Practitioners may choose from informal, conversational interviews or formal interviews based on structured protocols depending on the situation. An example of a typical interview protocol is the Problem Identification Interview (Kratochwill & Bergan, 1990), which is suitable for collecting information that can help with the problem-solving process. In addition to interview protocols, checklists or inventories such as the Functional Assessment of Academic Behavior (FAAB; Ysseldyke & Christenson, 2002) can help guide inquiry by focusing conversations on aspects of learning environments that are known to be important.

Another feature of ecological assessment is direct observation. Behavioral observations may provide details on the frequency, duration, or function of targeted behaviors in students’ natural settings. Reviews and interviews, limited by the extent to which data or perceptions are accurate or provide sufficient detail, help identify and define target variables for observation. Observational techniques also vary in formality. In the most basic form, an observation is a narrative description of settings, events, and behaviors as they occur. For example, observers using the Antecedent-Behavior-Consequence method informally record a series of events over a specified period of time. This method allows practitioners to easily identify patterns involving events occurring before and after the target behavior (Skinner, Dittmer, & Howell, 2000). More formal observational protocols (e.g., Systematic Direct Observation [SDO]) help illustrate the frequency and duration of targeted behaviors. Another often used example is the Behavioral Observation of Students in Schools (Shapiro, 2003). This standardized method uses momentary time sampling to record the frequency of specific behaviors, antecedents, and consequences.

Systematic direct observational techniques can pose some logistical difficulties as keeping track of timing intervals, coding behaviors, and recording data simultaneously can be difficult. These demands can prohibit the collection of sufficient or accurate data. Researchers have developed the use of computer software to automate timing and allow for rapid recording of observational data. The Ecobehavioral Assessment System Software (EBASS; Greenwood, Carta, Kamps, & Delquadri, 1992) allows for the assessment of student and teacher behaviors over time and settings (perhaps across a whole day). Systems like EBASS help lessen logistical barriers by allowing users to code for specific events or behaviors, by managing timing, simplifying
data entry, and by automatically reporting data that can be used to identify relationships between ecological variables and behaviors.

Another way in which logistical issues have been addressed is through the simplification of the materials and procedures used. Direct Behavior Ratings (DBR) are a form of SDO that has observers fill out extremely brief rating scales. Scales might involve recording the extent to which a student was actively engaged over a period of time or could include multiple items to address specific target behaviors. Given the brief and simple nature of DBR, independent observers are not necessary (meaning teachers, parents, or caregivers could easily collect DBR data), and the frequency of observations can be increased. Given the flexible and rapid nature of DBR, it is applicable not only to problem analysis but also in ongoing assessment or evaluation throughout the problem-solving process (Chafouleas, Riley-Tillman, & Christ, 2009).

**EVIDENCE FOR EFFECTIVE ASSESSMENT OF MENTAL HEALTH ECOLOGICAL FACTORS**

**Conjoint Behavioral Consultation**

Conjoint Behavioral Consultation (CBC) is characterized as a consultation procedure used by school-based practitioners that includes parents, teachers, and other mental health professionals (Auster, Feeney-Kettler, & Kratochwill, 2006). The ecological model is a foundational component in the conceptualization of the partnerships that are formed between the consultee and the consultant in CBC (Sheridan & Kratochwill, 2008). Although this procedure is generally viewed as a service delivery model that enables teacher and parent participation in treatment outcomes related to mental health concerns (Auster et al., 2006), its incorporation of the problem-solving model implicitly involves a structured assessment process.

CBC consists of an identification and analysis of the consultee’s needs, which then leads to the implementation and evaluation of a plan that draws upon the educational, family, and other support systems to impact the outcomes for the student (Sheridan & Kratochwill, 2008). Therefore, the consultees are involved in the assessment procedure as they provide their expertise on the area of focus to inform a treatment direction. Although CBC is not a method for targeting any specific mental health needs, it acts as a conduit for providing evidence-based interventions over a number of contexts such as home and school settings. Specifically, the training and communication that occur through CBC can increase treatment or intervention integrity and influence the likelihood of beneficial results (Auster et al., 2006). In summary, CBC appears to be a promising technique in the ecological assessment of student mental health needs, particularly in the gathering of resources.
and information from parents and other support systems in the community surrounding the school.

Solution-Focused Counseling

Solution-focused counseling (SFC) is a strength-based practice that is time efficient—allowing educational consultants to easily implement it into their practice. The ecological foundation of SFC is seen in its orientation toward empowering students, teachers, parents, and other professionals to have an impact on the solution to a problem (Murphy, 2008). Furthermore, its method emphasizes that professionals gain a better understanding of a student’s environment by taking into consideration the student’s developmental level, culture, and treatment acceptability through change-focused relationships that foster cooperation between all parties (Murphy, 2008). Therefore, its ease of use and applicability to a variety of settings make it an important tool for educational consultants.

Rating Scales

Rating scales are very useful to psychological consultants in assessing the ecological factors involved in student academic and socioemotional functioning. Rating scales allow the consultant to collect a great deal of data in a short time, which may not be the case for other sources of assessment such as interviews. A commonly used scale, the Behavior Assessment System for Children (Reynolds & Kamphaus, 2004), is an example of an assessment tool that encompasses teacher-, parent-, and self-rating scales and is useful in the assessment of clinical disorders (Tan, 2007). Another scale often employed is the Vineland Adaptive Behavior Scale (Sparrow, Balla, & Cicchetti, 1984), which also has a screening measure that can be used to assess the adaptive behaviors of individuals.

In recent years, the development of rating scales has shifted from a deficit orientation to a positive assessment of student behaviors (Jimerson, Sharkey, Nyborg, & Furlong, 2004). An example of one of these scales is the Devereux Student Strengths Assessment (LeBuffe, Shapiro, & Naglieri, 2009), which focuses on prevention by identifying resiliency factors that exist at home and at school. This type of rating scale may benefit a consultant by providing him or her with strengths and assets that may be used to inform effective intervention.

In summary, educational consultants have a number of tools and abilities that allow them to engage in a comprehensive assessment of the ecological factors that may be affecting a student’s mental well-being. Although the aforementioned practices and tools are not exhaustive, they provide a foundation for the comprehensive assessment of behaviors and socioemotional difficulties experienced by students in schools.
EVIDENCE FOR EFFECTIVE ASSESSMENT OF INSTRUCTIONAL ECOLOGY FACTORS

To conduct an ecological assessment one must analyze the child’s learning environments, which may include school, home, and the community (Wallace & Larsen, 1978). Ecological assessments allow us to determine a starting point for intervention by indentifying the student’s present level of academic achievement (Heron & Heward, 1988). There is limited evidence for the assessment of instructional environments to date. For example, although the Functional Assessment of Academic Behavior (Ysseldyke & Christenson, 2002) has been referred to as the most complete ecological assessment package (Sheridan & McCurdy, 2005), we do not yet know of a study that has examined its technical adequacy. We do know that children succeed when schools focus on instructional planning and delivery (Ysseldyke & Elliot, 1999) and that the home environment has a large effect on students’ academic success.

Daly and colleagues (Daly, Witt, Martens, & Dool, 1997) posited five reasons that students experience academic difficulty. Their reasons range from the student simply not wanting to do the task to the task being too hard for the student. Their hypothesis takes into account many of the variables in the five-way interaction between the learner and the environment identified earlier. Instead of discussing the evidence of specific ecological assessments, we highlight the research on the assessment of four of these variables.

Curriculum

It is important to assess the student’s skills across the entire curriculum (Hintze, Christ, & Methe, 2006). Curriculum-based assessment-instructional design (CBA-ID; Gickling & Havertape, 1981) allows us to determine if there is a gap between student skills and the demands of the curriculum. Conducting a CBA-ID facilitates the identification of specific areas of weakness and addressing them with specific interventions. The information from curriculum-based assessments, in turn, can be used to inform instruction.

Instruction

Instructional planning, management, and delivery all impact the academic achievement of students (Ysseldyke & Christenson, 2002). When planning instruction it is necessary to determine where the student lies in the instructional hierarchy (Haring & Eaton, 1978). For example, when a student is presented with a new skill (e.g., multiplication of decimals) he or she must first acquire the skill. The student must then become fluent with the skill before he or she can generalize it to novel contexts and adapt it according
to academic and real-world demands. For instruction to be useful it must be targeted at the proper level of this hierarchy or it will often be ineffective (Daly, Lentz, & Boyer, 1996). Instruction must also be at the appropriate level of difficulty for the student. Gickling and Armstrong's (1978) seminal work on instructional frustration provides an important outline for targeting instruction. Students should know between 93% and 97% of elements in the task to be engaged and gain the most from the activity. Researchers have found that students with academic difficulties demonstrate greater progress when instruction is within this range (e.g., Burns, 2007).

There are several published instruments to assess instruction. They range from qualitative rating scales (Instructional Priority System; Welch & Link, 1991) to computer-based assessments that use handheld devices (EBASS; Greenwood et al., 1992). More comprehensive reviews can be found in Ysseldyke and Burns (2009) and Salvia et al. (2010).

Home

There is no question that parents and the home environment play a large role in the academic achievement of students. Ecological assessments allow us to identify both strengths and weaknesses in the home environment. Christenson and Sheridan (2001) suggest that our assessments should target support for learning, expectations, structure and discipline, enrichment levels, communication, and affect. These variables are correlated with student achievement and the degree of match between the school and home on these variables can further influence academic achievement (Sheridan & McCurdy, 2005). Although some of the home variables that impact student achievement are unalterable (e.g., SES), a valuable goal of ecological assessment in this area is to build a link between home and school with the goal of developing consistency to the maximum extent possible between these two environments.

Learner

A comprehensive ecological assessment takes characteristics of the learner into account when identifying variables that affect academic achievement (Heron & Heward, 1988). Physiological factors (e.g., hearing impairment, brain injuries) may affect student achievement and it is important that our ecological assessments identify these factors when relevant. For example, neurological issues may affect students' organization abilities, attention, or memory. When an ecological assessment includes a review of medical records or interview with a parent it may allow us to differentiate between physiological factors and other factors (e.g., motivation) affecting the student's achievement.
CHALLENGES AND FUTURE DIRECTIONS

Here we identify several points of consideration for further development of methods, instrumentation, and implementation in ecological assessment.

Methods

Ecological assessment methods must be feasible, frequent, and accurate. If ecological assessments are to be an integral part of consultation our methods should produce quantitative data, whenever possible, to inform effective intervention. Ecological assessments must be guided by precise operational definitions of the variables being observed to ensure accuracy. Without accurate data educators may attempt several interventions before an efficacious one is found while students continue to languish behind their peers. The assessments themselves should not be so time-consuming or intrusive that they cannot be used frequently. Quick and accurate assessments are useful during the problem analysis and treatment evaluation phases of consultation (Kratochwill & Bergan, 1990).

Instrumentation

Despite the relative merits of the tools we have discussed, more improvement is needed. There is considerable consensus on how environmental factors affect student achievement and although the knowledge base for mental health in children and adolescents is growing, more research is needed within educational contexts. This may explain the disparity in the amount of ecological assessment instruments that measure mental health factors. We have yet to see the development of specific, quantifiable, and accurate tools that can be used in the classroom to assess, monitor, and inform interventions for students who are struggling with social or emotional problems that affect mental well-being.

Ecological assessments for mental health factors are needed to better inform further assessment or intervention in specific areas. At the universal level there is an abundance of screening tools, but few focus on ecological factors. The majority of available comprehensive inventories of family and school environments have focused on academics. There is also a need for more targeted instruments that are precise and focused as current ecological assessment instruments are often broad in scope. For example, FAAB covers 23 components of instructional environments, providing breadth rather than depth of information. We need to measure specific components in greater depth and use them together with information obtained from broad measures to better inform consultation and intervention.

Proper methods and instrumentation are not the only requirements to successfully integrate ecological assessments into consultation practices.
These assessments must be feasible for use by educators in diverse and overcrowded schools. Historically, ecological assessments of academic or mental health factors have relied upon paper-and-pencil materials for data collection and management. Collecting valid ecological data in this fashion can be unwieldy for teachers and consultants. Over the years, researchers and practitioners have gradually made use of technology to expedite data collection and management. This also increased the amount and expanded the scope of information that could feasibly be collected. It is little surprise that technologically enhanced assessments are gaining popularity in schools for the purposes of progress monitoring and targeting instruction to students' skill levels. Specifically, the handheld devices used for other educational purposes seem to hold considerable promise for ecological assessment.

Implementation

The chief concern related to implementation is fidelity. But, procedural adherence alone does not amount to quality implementation. Deriving the most helpful information out of ecological assessments is dependent upon the extent to which educators are prepared to make use of those assessments—educators and consultants should not only know what to do but also should know how and why. This requires professional development in the instructional and mental health factors that affect educational outcomes.

SUMMARY

In this article we discussed ways in which ecology is understood in education, described environmental factors that influence academic achievement and mental health, and reviewed evidence in support of practices that target those factors. Although most of the countless assessment tools available are designed to describe traits of individuals, a growing number are intended to assess environmental factors and have direct applicability to ecologically oriented consultation. Examples include student data systems, interview protocols for use with parents and teachers, an array of observational tools ranging from paper forms to computer software, and tests or inventories that procure information from student’s microsystems. Our goal was not to evaluate such practices and instruments but to illustrate their potential contribution to academic and mental health consultation.

REFERENCES


Assessment of Ecological Factors


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APPENDIX

INSTRUCTIONAL SUPPORT FOR LEARNING COMPONENTS

Instructional support for learning components

Instructional Planning: Decisions are made about what to teach and how to teach the student. Realistic expectations are communicated to the student.
- Instructional Match: The student’s needs are assessed accurately, and instruction is matched appropriately to the results of the instructional diagnosis.
- Instructional Expectations: There are realistic, yet high, expectations for both the amount and accuracy of work to be completed by the student, and these are communicated clearly to the student.

Instructional Managing: Effective instruction requires managing the complex mix of instructional tasks and student behaviors that are part of every classroom interaction. This means making decisions that control and support the orderly flow of instruction. To do this, teachers make decisions about classroom rules and procedures as well as how to handle disruptions; how to organize classroom time and space to be most productive; and how to keep classrooms warm, positive, and accepting places for the student with different learning preferences and performances.
- Classroom Environment: The classroom management techniques used are effective for the student; there is a positive, supportive classroom atmosphere; and time is used productively.

Instructional Delivering: Decisions are made about how to present information as well as how to monitor and adjust presentations to accommodate individual differences and enhance the learning of the student.
- Instructional Presentation: Instruction is presented in a clear and effective manner; the directions contain sufficient information for the student to understand the kinds of behaviors or skills that are to be demonstrated; and the student’s understanding is checked.
- Cognitive Emphasis: Thinking skills and learning strategies for completing assignments are communicated explicitly to the student.
- Motivational Strategies: Effective strategies for heightening student interest and effort are used with the student.
- Relevant Practice: The student is given adequate opportunity to practice with appropriate materials and a high success rate. Classroom tasks are clearly important to achieving instructional goals.
- Informed Feedback: The student receives relatively immediate and specific information on his or her performance or behavior; when the student makes mistakes, correction is provided.

Instructional Evaluating: Effective instruction requires evaluating. Some evaluation activities occur during the process of instruction (i.e., when teachers gather data during instruction and use those data to make instructional decisions). Other evaluation activities occur at the end of instruction (e.g., when the teacher administers a test to determine whether a student has met instructional goals).
- Academic Engaged Time: The student is actively engaged in responding to academic content; the teacher monitors the extent to which the student is actively engaged and redirects the student when the student is unengaged.
- Adaptive Instruction: The curriculum is modified within reason to accommodate the student’s unique and specific instructional needs.
- Progress Evaluation: There is direct, frequent measurement of the student’s progress toward completion of instructional objectives; data on the student’s performance and progress are used to plan future instruction.
- Student Understanding: The student demonstrates an accurate understanding of what is to be done and how it is to be done in the classroom.