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Past, Present, and Future of Research in School Psychology: The Biopsychosocial Ecological Model as an Overarching Framework

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Conoley, Powers, and Gutkin (2020) called for an increased emphasis on models of psychological service delivery that are primarily indirect, adult-focused, and geared toward systems-level change in the schools. They asserted that research in school psychology should not focus on the problems of individual children and youth but address the "powerful ecosystems" that surround them. Although school- and system-wide interventions are certainly important and can have a positive impact on student outcomes, we contend that biopsychosocial models of human development that integrate the effects of genetics, personal characteristics and behaviors, environments, and broad social contexts are better frameworks for guiding future research in school psychology. In these models, the role of genetics is mediated by the family environment and broader social contexts to influence variability in cognitive, social-emotional, and behavioral domains of psychological functioning. These individual differences then interact with specific situations, leading to outcomes in educationally relevant behaviors, such as achievement, self-esteem, motivation, and peer relations. The focus of research in school psychology, therefore, should not be on "1 size fits all" school-wide interventions but rather on understanding how and why children and youth differ from one another and on translating research on the effects of genes, the environment, and their interplay into effective educational interventions. Research on bullying and victimization in schools is discussed as an example of the importance of taking a biopsychosocial ecological approach to studying complex behavior.

Impact and Implications

In this commentary, we explain why biopsychosocial models of human development are optimal for guiding research in school psychology. The focus of research in school psychology should not be on "1 size fits all" school-wide interventions but on understanding how and why children and youth differ from one another and on translating research on the effects of genes and the environment and their interplay into effective educational interventions.

Keywords: school psychology research, biopsychosocial model, ecological model, genetics, models of service delivery

In their article titled "How is School Psychology Doing: Why Hasn't School Psychology Realized its Promise?", Conoley, Powers, and Gutkin (2020) revisited arguments made more than 2 decades ago by Conoley and Gutkin (1995). Conoley and Gutkin asserted that research in the field of school psychology "is devoted almost exclusively to answering the wrong sets of questions. It is a science that is preoccupied with the problems of individuals rather than understanding the ecologies in which people function" (p. 210). As in the earlier article, Conoley et al. argued for an increased emphasis on models of service delivery in the schools that are primarily indirect, adult-focused, and geared toward systems-level change. They maintained that school-wide interventions are comparable to such preventative measures as vaccinations and hand washing for promoting the psychological and educational development and well-being of children and youth. Conoley et al. concluded that contemporary research in school psychology must change to focus on "the powerful ecosystems that affect children's well-being" (Conoley, 2020, p. 367).

According to the Model for Comprehensive and Integrated School Psychological Services (National Association of School

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Psychologists, 2010), "school psychologists have knowledge of varied models and methods of assessment and data collection for identifying strengths and needs, developing effective services and programs, and measuring progress and outcomes" (p. 4). Although assessment is central to the data-based decision making and accountability practices that permeate all aspects of service delivery, school psychologists have long spent a disproportionate amount of time in assessment activities related to determining eligibility for special education and related services, as Conoley et al. (2020) underscored. Over the past 25 years, most estimates suggest that school psychologists spend about 50% of their time in assessment activities related to eligibility determination and only about 10% to 15% of their time providing preventive services (Benson et al., 2019). Consequently, Conoley et al. argued for a renewed emphasis on the development of effective services and programs, primarily at the systems level, in the practice of school psychology.

From a pragmatic standpoint, we agree with Conoley et al. (2020) that the practice of school psychology should emphasize the development of effective services and programs for the development of academic and socioemotional functioning of all students to a much greater extent. This includes school- and systems-level interventions that are focused on changing the behavior of adults. Parents, teachers, and other adults are ever-present in the lives of children and youth, and these adults, serving as role models and change agents, can have powerful influences on their development. We also agree with Conoley et al. that the professional services and programs that are delivered to children and youth, families, and schools must be substantiated with scientific evidence before they are broadly implemented (Kratochwill & Shernoff, 2004). Thus, research in school psychology should emphasize to a greater extent evaluation of the "quality, robustness, or validity of scientific evidence as it is brought to bear on decisions regarding the adoption, implementation, and/or evaluation of services" (Kratochwill, 2007, p. 830).

Although school- and system-wide interventions can have a positive impact on student outcomes, we contend that models of human development that integrate the effects of student genetics, student personal characteristics and behaviors, the immediate environments around them, and broad social contexts are better frameworks for guiding future research in school psychology. Examples of these models are the bioecological model of human development (Bronfenbrenner & Morris, 2006) and the unified theory of development (A. Sameroff, 2010).

Why should these integrative models guide school psychology research? First, there is substantial evidence that schooling-related influences have less effect on student development than other individual and environmental influences. For example, in 1965, Coleman and his team conducted one of the largest testing and survey efforts ever undertaken in the nation's schools, gathering data from approximately 4,000 schools, 66,000 teachers, and 650,000 students. Results of their study were surprising to many at the time. As summarized in the Coleman (1966) report, "Taking all these results together, one implication stands out above all: That schools bring little influence to bear on a child's achievement that is independent of [his or her] background and general social context" (p. 325). Results of the Coleman report have been replicated many times (Hill, 2017). Differences in teacher and school quality tend to explain no more than 10% to 20% of the variance in student educational attainment, whereas the family background of students explains much more. The same argument can be made for the social–emotional functioning of children and youth.

Second, the most well-designed research should be aspirational and expansive, in an attempt to be comprehensive, rather than restrictively focused on only a small number of questions and explanations. Research that is too narrowly focused may lead to *specification error*, a serious problem where key variables are omitted from consideration, inflating the effects of some variables while overlooking others. There is ample evidence to support school psychology researchers delving deeper into the personal characteristics of students, expanding their focus on broader features within their ecology, and examining dynamic interactions between and among students and these environmental features across development.

Results of research on scholarship in the field of school psychology indicates that it has long been aspirational and expansive (e.g., Carper & Williams, 2004; Kranzler, Grapin, & Daley, 2011). Kranzler et al. (2011), for example, found that the themes of research published by faculty in school psychology programs focused on a wide range of topics, the majority of which concerned professional issues (47%), followed by intervention (26%), psychoeducational assessment (20%), and consultation (3%). The expansiveness of the research foci in the field is further reflected in the fact that only about 30% of the peer-reviewed articles published by faculty in school psychology programs appeared in the major journals in school psychology and 70% in other journals in the social and behavioral sciences. Moreover, the other social and behavioral sciences journals in which school psychology faculty published the most seemed to reflect a shift in the focus of research for school psychology toward a greater emphasis on evidence-based practice in the schools (Villarreal & Umaña, 2017). Furthermore, given that the research question is paramount when deciding upon the research design and methods to be used in any study, it is to be expected that the types of methods used have also varied greatly in the school psychology literature from 25 years ago up to today (e.g., Keith, 1988). Researchers in the field have used quantitative, qualitative, and mixed methods, using many if not all the different kinds of designs available within each type of method, depending upon its suitability for answering the research questions posed.

Given the broad focus of research in school psychology, what should be the overarching framework for research in the field? We answer this question by first presenting an integrative biopsychosocial ecological model of human development to guide school psychology research. We then review research on the sources of individual differences across students, provide an example of the biopsychosocial ecological model in research on bullying and victimization, and discuss implications for future research.

Comprehensive Theoretical Models of Development

We believe that an expansive biopsychosocial ecological model of human development should be the overarching framework of future research in school psychology. To illustrate its features and promote its application, we adapted A. Sameroff's (2010) unified theory of development to address key considerations. A graphic representation of our biopsychosocial ecological model is presented in Figure 1.

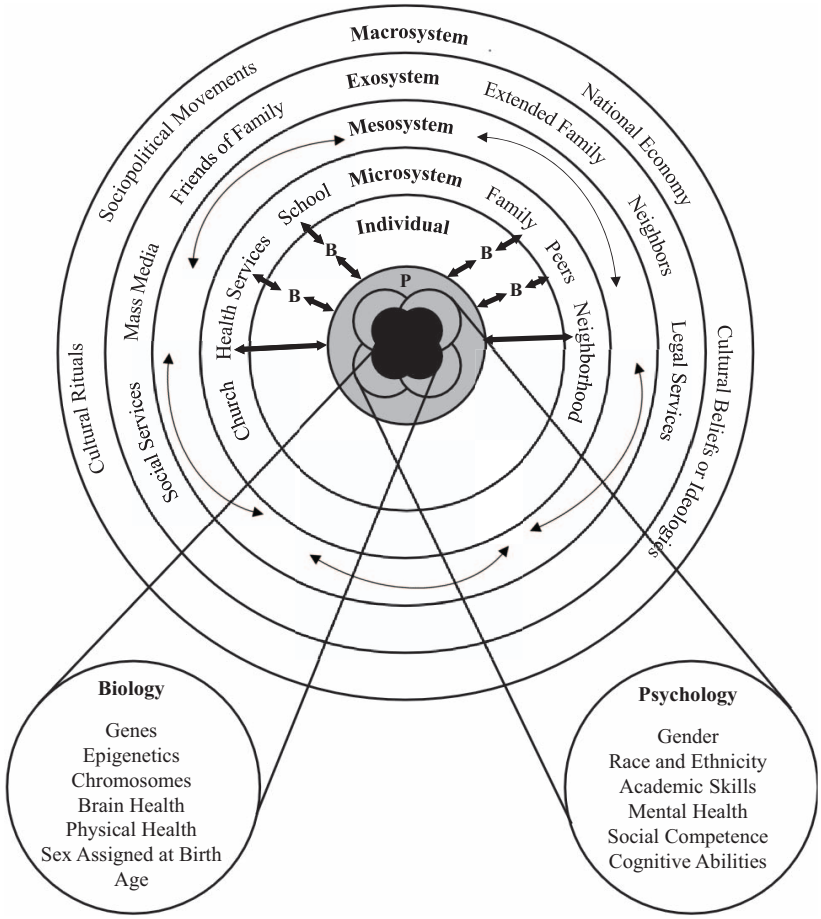

Figure 1. A biopsychosocial ecological model addressing student development in school and related settings. From "A Unified Theory of Development: A Dialectic Integration of Nature And Nurture," by A. Sameroff, 2010, *Child Development*, *81*, p. 18. Copyright 2017 by Blackwell Publishing. From "Psycho-ecological Systems Model: A Systems Approach to Planning and Gauging The Community Impact of Community-Engaged Scholarship," by R. N. Reeb, N. L. Snow-Hill, S. F. Folger, A. L. Steel, L. Stayton, C. Hunt, C., & Z. Glendening, 2017, *Michigan Journal of Community Service Learning*, *24*, p. 14. Copyright 2017 by University of Michigan Press. Adapted with permission. P = person; B = behavior.

The Individual

At the center of the concentric circles in Figure 1 is the individual student. More generally, it is the person in question, and more basically, it is the self (A. Sameroff, 2010). This component of the model reflects all the biological processes, psychological constructs, and physical features associated with each individual. Biological processes include those associated with genes, chromosomes, sex assigned at birth, physical health, and age. Psychological constructs include a vast array of knowledge, skills, and abilities that school psychologists understand very well: emotions; self-perceptions; beliefs; attitudes; and identities. Our addition to the model, physical features, include height; weight; facial features; gender expression; and eye, skin, and hair color, among others. Like A. Sameroff's (2010) model, the interactions among the biological processes are indicated by overlapping black circles, and interactions among psychological constructs are indicated by overlapping gray circles. In our model, physical features are represented by the outer perimeter inside the broader circle reflecting the person.

The Experiences of the Individual

Individuals exist within an immediate environment that is shaped by their actions and that in turn shapes both who they are and their patterns of behaviors. Consistent with this conception, we included Bandura's (1978) concept of *triadic reciprocal causation* in our model (see also Reeb et al., 2017). Triadic reciprocal causation recognizes the interactions between (1) the person's biological processes, psychological constructs, and physical features; (2) behaviors displayed by the person (represented by Bs near the center of Figure 1); and (3) the environment that shapes and is shaped by the person and his or her behaviors. Double-headed arrows evident in the center of Figure 1 indicate this interaction. These individual differences interact with specific

situations, leading to outcomes in educationally relevant behaviors (e.g., achievement, self-esteem, motivation, and peer relations).

Expanding from the individual represented in the center of the model are broader environmental contexts—levels of proximal and distal influences that are nested within one another (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006). They include many of the elements highlighted by Conoley et al. (2020), such as adults in the lives of students. They also include siblings, peers, extended family, and people in their neighborhoods, public centers, businesses, and broader community with whom they interact. These influences compose the microsystem, and they can have immediate and profound effects on the individual. Key microsystem influences may also interact with one another—sometimes outside of the experience of the individual and, at other times, in the same context as the individual. These interactions compose the mesosystem.

Extending out in the model, there are distal influences on the individual, such as community health services, school boards, parent employment settings, and government supports, that affect individual students and the settings in which they interact indirectly; these are exosystem influences. The broad values, beliefs, laws, and customs that permeate the world in which the individual lives also have indirect effects through the more proximal influences; these are macrosystem influences. Influences at any of these system levels may be either a risk factor, contributing to weaker adaptation and lower functioning of the individual, or a promotive factor, contributing to their stronger adaptation and higher functioning (A. J. Sameroff, 1999).

Comparison to Conoley et al. (2020)

The article by Conoley et al. (2020) frequently mentioned systems-level effects, but their examples primarily focused on microsystems—especially the adults in students' lives. Although Conoley et al. might have been correct when they argued that research in school psychology overemphasizes study of the problems of individuals rather than their surrounding ecologies, we contend that interactions between individual differences in person factors and their surrounding environment are vitally important and have, in fact, received too little attention. For example, Conoley et al. did not mention the mediating effects of students' varying ages and developmental levels; risk and promotive factors within students, which could include gender, race, and ethnicity; or individual differences in cognitive abilities that may make learning in schools more difficult for some students than others.

Thus, comprehensive biopsychosocial models of human development, such as the one presented here, are better frameworks for guiding future research in school psychology. In these models, the role of genetics is mediated by the family environment and broad social contexts to influence variability in different domains of psychological functioning (i.e., cognitive, social–emotional, and behavioral). These individual differences then interact with specific situations, leading to outcomes in educationally relevant behaviors, such as achievement, self-esteem, motivation, and peer relations. We contend that the focus of research should not be on "one size fits all" school-wide interventions, but rather on interventions that maximize these biopsychosocial interaction effects.

Understanding Sources of Individual Differences

One step toward identifying these interaction effects lies in understanding why children and youth differ on important characteristics related to schools and schooling. Quantitative behavioral genetics is the best model for doing so, because it can disentangle the genetic and environmental origins of individual differences in behavior. The primary goal of behavioral genetics is to investigate the nature and origins of individual differences in behavior. The methods of behavioral genetics have been effectively applied to the study of individual differences in general and specific cognitive abilities, academic achievement, learning disabilities, and developmental psychopathology, among many other domains (see Knopik, Neiderhiser, DeFries, & Plomin, 2017). Research in behavioral genetics has made great strides over the past 25 years. Plomin, DeFries, Knopik, and Neiderhiser (2016) recently summarized the Top 10 "big" findings in behavioral genetics research, all of which have been replicated numerous times in different domains and have large effect sizes. We discuss here only several of these findings but believe that these have significant implications for future research in school psychology (see also McIntosh, Martinez, Ty, & McClain, 2013).

All Psychological Characteristics Show Significant and Substantial Genetic Influence

Research in behavioral genetics strongly supports the important role of genetics in many domains of psychological functioning relevant to the field of school psychology, including general and specific cognitive abilities, academic achievement, specific learning disabilities (SLD), intellectual disability, and psychopathology, among others. Plomin and colleagues (2016) stated that "significant and substantial genetic influence on individual differences in psychological traits is so widespread that we are unable to name an exception" (p. 5). Not only has the heritability of all psychological characteristics been found to be statistically significantly greater than zero, they have also consistently been found to be substantial, often accounting for 50% of the variance.

Autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD) are the two childhood disorders with the highest heritability estimates, with values as high as 90% for ASD in some studies and 75% for ADHD (Knopik et al., 2017). Behavior genetic research on disruptive behavior disorders in children and youth has also found that aggressive antisocial behavior is more heritable than nonaggressive rule-breaking behavior (Burt, 2009). Research on juvenile delinquency, in contrast, has shown only modest genetic effects (e.g., McGuffin & Gottesman, 1985). In addition, the heritability of general cognitive ability has been found to increase linearly from about 20% in infancy, to about 50% in childhood and youth, and to about 80% in adulthood, with the same genes affecting individual differences throughout the life span (Plomin & Deary, 2015). Results of behavioral genetic research also strongly indicate that SLD has a substantial heritable component (e.g., Fletcher & Grigorenko, 2017). In a recent meta-analysis, Snowling and Melby-Lervåg (2016) found that children and youth in families with a history of reading disability (RD) are four times more likely to have a RD than offspring in control families with no history of RD. Research has also found that anxiety and depression among children and youth are substantially

heritable and that the high rate of comorbidity between them is largely due to genetic effects (e.g., Franić et al., 2013).

No Traits Are 100% Heritable

Although all psychological traits show substantial genetic influence, the heritability of any trait is significantly less than 100% (Plomin et al., 2016). Research in behavioral genetics, therefore, strongly supports the important role of both genetics and the environment in all domains of psychological functioning. The amount of variance attributable to heritability for different psychological characteristics is typically between 30% and 50%, which means that at least half the variance must be explained by the environment and/or by gene–environment interplay, which refers to gene–environment interactions and correlations.

In addition to the "main effects" of genes and the environment, phenotypic variance may also result from combined genetic and environmental influences, of which there are two kinds: genotype–environment interaction and genotype–environment correlation. Genotype–environment interaction refers to the nonlinear combination of genetic and environmental effects on behavior. This occurs when the impact of the environment upon a particular trait depends upon the genotype. Few genotype–environment interactions have been discovered in animal or human research that account for more than a negligible portion of phenotypic variance, however. Although some maintain that that this might be related to ineffectual measurement of environmental factors or to insufficient power in research studies, others believe that the paucity of genetic-environmental interactions that have been discovered may simply stem from the fact that little is known about which features environment and genotype might interact (e.g., Plomin et al., 2016).

In contrast, gene–environment correlation refers to relations between the environments to which individuals are exposed and their genetic propensities. Gene–environment correlations can be passive, reactive, or active. A passive genotype–environment correlation exists when individuals inherit environments that are correlated with their genetic predispositions. Children do not select the environments into which they are born. Environments that are favorable or unfavorable to the development of particular traits are imposed upon them. An example of a passive genotype–environment correlation is when children with superior musical genotypes are born to and raised by parents who provide a musically stimulating environment. This type of correlation also exists when children with relatively poor musical genotypes are born to and raised by parents who provide a musically impoverished environment. A reactive genotype–environment correlation refers to environments that are selected or created by others in reaction to an individual's genetic predisposition. A common example in the schools is the identification and placement of children in special classes for the intellectually gifted. Last, an active genotype–environment correlation occurs when individuals select or create environments that are correlated with their genotypes. For example, children with superior musical genotypes may spend more time listening to, thinking about, and practicing music than other children, regardless of whether anyone wants them to or not. The result of passive, active, and reactive genotype–environment correlations is to increase the phenotypic variance in a trait. Results from research on gene–environment interplay will likely further understanding of how the environment and genetic factors interact to explain variability in the development of psychopathology.

Most Environmental Effects Are Not Shared by Children Growing Up in the Same Family

One of the most interesting discoveries in behavioral genetic research concerns the influence of the environment on individual differences in psychological characteristics and not genes. In behavioral genetic research, variance in an observable, measurable characteristic of an individual (i.e., phenotype) is partitioned into components of variance reflecting an individual's genotype and the environment. Environmental variance can be further partitioned into two subcomponents: *shared* and *nonshared*. Shared environmental influences reflect common experiences that make individuals in the same family similar to each other and different from those in other families (e.g., socioeconomic status and parenting style). In contrast, nonshared environmental influences reflect unique life experiences of individuals in the same family and do not contribute to similarity among members of the same family (e.g., different friends, teachers, and experiences, including accidents and illnesses). It is important to note that these sources of environmental influences refer to effects and not events, because children in the same family may experience the same event differently (e.g., parental divorce).

Since the publication of Coleman (1966) report, we have known that the family backgrounds of children and youth are much more predictive of educational outcomes than are characteristics of teachers and schools. Because children raised in the same family are indeed similar, shared environmental effects are widely held to be responsible, when in fact behavioral genetic research has shown that much of this resemblance results from shared genes. In contrast, shared environmental effects contribute relatively little, if at all, to individual differences in most psychological characteristics. Thus, behavioral genetics research has shown that "most of the effective environmental influence on personality and psychopathology and on cognitive development after childhood is not shared by two children growing up in the same family" (Haworth & Plomin, 2012, p 535). Given that nonshared environmental effects are related to the unique experiences of individuals, results of behavioral genetics research strongly suggest that future research should take into consideration students' individual differences and their interaction across different environmental contexts.

Bullying, Victimization, and the Biopsychosocial Ecological Model

We use the research area focused on bullying and victimization in schools as an example of the importance of taking a biopsychosocial ecological approach to studying complex behavior. *Bullying* is defined as unwanted aggressive behaviors that are perpetrated on someone with less power. These behaviors are repeated and inflict harm or distress on the recipient (Gladden, Vivolo-Kantor, Hamburger, & Lumpkin, 2014). Bullying is a significant problem in the schools, with between 19% and 35% of middle school students reporting bullying involvement (e.g., Modecki, Minchin, Harbaugh, Guerra, & Runions, 2014). Additionally, there are a wide variety of negative outcomes for youth involved in bullying, including both internalizing and externalizing problems (e.g.,

Kelly et al., 2015). Thus, more research is needed to address this important social issue. Researchers have applied the social ecological model to help understand the complexities and influences surrounding bullying behavior (e.g., Espelage & Swearer, 2010). As we have proposed, research focused on all aspects of the biopsychosocial ecological model may help us more thoroughly understand how to prevent and address bullying in schools. In the following sections, we illustrate how studying bullying via the biopsychosocial ecological model may help elucidate the important factors associated with bullying/victimization.

Individual

Understanding individual associations and contributions to bullying behaviors is important to fully understand the phenomenon. Again, we noted that the individual in the biopsychosocial ecological model includes biological processes, psychological constructs, and physical features. Regarding biological processes, some research has found that males are more likely to be victims and perpetrators of bullying (e.g., Seals & Young, 2003). According to Silva, Pereira, Mendonça, Nunes, and de Oliveira (2013), for example, "gender is one of the fundamental variables in understanding this phenomenon and supports possible interventions" (p. 6822). Another biological process that is studied less often in bullying is genetics (Musci et al., 2018). For example, Connolly and Beaver (2016) found that genetic influences accounted for substantial portion of the variance in repeated bullying victimization, delinquent activity, and internalizing disorders in youth, with genetic factors accounting for much of the covariance among them. The remaining variance was explained by nonshared environment, while shared environmental was not a significant predictor. Recent research is also finding associations among bullying behavior and genetic risk scores. For example, Musci and colleagues (2018) found a polygenic risk score at ages 19 to 21 years from a conduct disorder genome-wide association study was associated with bullying behavior classifications in first grade.

There are many psychological constructs relevant to the individual that have been studied and been found to be associated with various bullying behaviors. For example, individual skills, such as social skills (Jenkins, Demaray, Fredrick, & Summers, 2016), and attitudes, such as attitudes toward homosexuality (Orue & Calvete, 2018), have significant associations with bullying/victimization. Research has also found differences in bullying for youth with disabilities (Bear, Mantz, Glutting, Yang, & Boyer, 2015). Research conducted on physical characteristics of youth also demonstrates significant associations with bullying behaviors. For example, we know that youth who are obese or overweight experience higher rates of bullying (Van Geel et al., 2014).

Microsystem and Mesosystem

A significant amount of research has investigated the microsystems that are related to bullying/victimization. Research on the microsystem aligns well with Conoley et al.'s (2020) emphasis on indirect models of service delivery in the schools and school-wide intervention and prevention efforts. For example, a considerable amount of research on bullying has focused on school climate (e.g., Klein, Cornell, & Konold, 2012) and school-wide prevention efforts for bullying (e.g., Bradshaw, 2013). Additionally, other microsystems that have been studied in relation to bullying/victimization include the family and neighborhood (e.g., Christie-Mizell, Keil, Laske, & Stewart, 2011). Research has also investigated how these environments interact, the mesosystem, to contribute to risk or protect youth from bullying (Bowes et al., 2009). By studying the microsystem and mesosystem, we can learn how different environments are associated with bullying and can target the environment and individuals in that environment (e.g., teachers and parents) for intervention. For example, results of a recent study examining the interplay between bullying victimization, delinquency, and internalizing disorders suggested that

> individuals with propensities for delinquent behavior may actively self-select into antisocial peer groups that increase their exposure to bullies and frequent victimization. . . . However, genetically influenced depression/anxiety disorder may also evoke bullying efforts from peers because bullies perceive individuals with such symptoms as "easy targets." (Connolly & Beaver, 2016, p. 1247)

Consideration of individual differences and their interaction across different environmental contexts may lead to breakthroughs in research on bullying and victimization.

Exosystem

It is important to study the broader environments (e.g., the legal system and school boards) that a child does not directly interact with but which may impact the child's life by influencing the amount of bullying in their schools. For example, results of a recent study on antibullying laws found that states that required comprehensive antibullying policies had an 8% to 12% reduction in bullying (Sabia & Bass, 2017). This is important information for those studying bullying and trying to reduce bullying in schools. Recent research has also focused on students who identify as lesbian, gay, bisexual, transgender, queer, and questioning, because they are at greater risk of bullying. Lower rates of bullying have been reported for schools that implement specific policies regarding sexual orientation and gender identity (Russell, Day, Ioverno, & Toomey, 2016). Thus, although the direct environments in which students function are important, it is also critical to conduct research on the broader indirect influences in the environment, such as state laws and school board policies.

Macrosystem

The most distal influence on bullying is the macrosystem. The macrosystem consists of the broad societal impact on youth, including cultural norms and beliefs (Hong & Garbarino, 2012). One way to conceptualize how the broad society impacts bullying is via the stigma-based bullying framework (Earnshaw et al., 2018). Within this framework, there are social stigmas when a society devalues certain characteristics/identities. Broad social stigmas and beliefs of a culture may result in structural biases that are reflected in the policies, laws, and practices at the exosystem level. Then, these social stigmas play out in interpersonal interactions that may include behaviors such as bullying. For example, Hong and Garbarino (2012) discussed the influence of a heteronormative culture in relation to homophobic bullying. It is important for research to consider these broad cultural influences on bullying as they may help inform intervention strategies.

Implications for Future Research

We applaud Conoley et al.'s (2020) encouragement of research focusing on influential social contexts, as well as adults in the ecology of children and youth; both are necessary to advance research and practice in the field of school psychology and both are understudied. We also agree that school psychologists continue to spend an inordinate amount of time in assessment activities related to determining eligibility for special education and related services and that more emphasis should be placed on the development and delivery of effective services and programs to schools, families, and the community. Indeed, as they stated, "we continue to believe that school psychologists are uniquely placed within a system of incredible importance to child development. No other psychological specialty has this daily access to the ecologies that affect human development in such crucial ways" (Conoley et al., 2020, p. 372).

To develop and deliver the most effective evidence-based services and programs, research in school psychology needs to be aspirational, expansive, and comprehensive to solve complex problems, as our example with bullying and victimization research illustrates. Given the important role played by both genes and the environment on individual differences in child development, we believe that Conoley et al.'s (2020) appeal for an emphasis on the ecosystems of schools is too narrowly focused. In addition to substantial genetic influences, the environmental effects that are most important for understanding individual differences in cognition, achievement, and psychopathology, among others, are nonshared, which means that these effects are not school-wide, or classroom-wide, or even family wide, but operate on an individual-by-individual basis. In other words, individual differences on many important psychological characteristics do not stem from merely being in the same physical environment (e.g., school, classroom, or family), but are related to an individual's perception or experience of those environments or to environmental experiences that are unique to an individual (Haworth & Plomin, 2012). Moreover, because the genotype of individuals is determined at the moment of conception, school-wide interventions are unlikely to prevent many school-related problems, such as ASD, ADHD, and SLD, which are substantially related to heredity and not caused solely by exposure to environmental pathogens.

Thus, biopsychosocial ecological models, such as the one presented here, are arguably better for guiding future research and practice. These frameworks complement Conoley et al. (2020), in that systems-level consultation is necessary within a comprehensive interdisciplinary approach to meeting the needs of children. They apply to many areas that affect children and youth in schools, including those discussed previously in this article as well as physical health conditions, among others. Chronic medical conditions in children and youth, such as asthma, cancer, diabetes, chronic pain, and epilepsy, have psychoeducational implications that are served most effectively with interdisciplinary collaboration within an ecological model, especially a biopsychosocial ecological model. Asthma is an example of a physical health condition related to supporting students' mind-body health at both the individual and systems level, using an ecologically oriented framework. Asthma can be triggered by anxiety. Therefore, psychologically based treatments, such as relaxation and guided imagery (RGI; Kapoor, Bray, & Kehle, 2010), have been successful in increasing lung functioning at the same time as decreasing depression, stress, and anxiety. Results of research in the area of chronic health conditions are beginning to be translated into practice in terms of servicing students in multitiered systems of supports. Tiered frameworks are now including physical health outcomes. At Tier 1, data on such important areas as sleep, medication usage, exercise, and so forth are being collected and, more important, integrated into problem-solving models. Treatments such as RGI have been implemented successfully at Tiers 2 and 3 (Kapoor et al., 2010).

Although there is no doubt that the biopsychosocial model is being translated into practice, there is still work to be done related to the cross-disciplinary aspects of its process, options for ecological assessment, and how treatment interfaces with the individual and the broader environmental context, including the levels of proximal and distal influences that are nested within one another. These areas need validation relative to implementation within biopsychosocial ecological models. In particular, ecologically valid assessments need to be developed for this purpose as well as further intervention research on chronic health involving other fields of study, such as biology, neurology, and immunology (Perfect & Moore, 2019). Moreover, research in these areas is prime for funding by agencies such as the National Institutes for Health and the National Institute for Child Health and Human Development. This research also has great potential to address student functioning, including the effects of physical health and wellness, which is an area gaining in empirical support and, at the same time, in great need of further investigation.

The work of Roberts, Aylward, and Wu (2014) further supported the application of the biopsychosocial model with interventions for youth with medical conditions and calls for future research. These authors described how ecological frameworks appreciate systemic influences and, in so doing, complement and reconcile both the biopsychosocial approach with the writing of Conoley et al. (2020). Thus, Roberts et al.'s conceptualization fits well with what we and Conoley et al. propose in terms of consultative service delivery and ecological models, especially because such interdisciplinary professional collaboration (e.g., with school nurses) will likely lead to positive outcomes incorporated into educational practices.

Based on our review of the behavior genetic literature, some of the most important foci of future empirical research should be on understanding how and why children and youth differ from one another on important psychological characteristics, as well as for translating empirical investigations on genetic and environmental factors and their interplay into effective educational interventions. Haworth and Plomin (2012) stated the following:

> Although decades of research on the nature and nurture of children's development in families has led to a consensus in developmental psychology that recognizes the importance of genetics as well as environment (Plomin, 2004), this fundamental issue of the interplay of nature and nurture has only just begun to be addressed in relation to education (Plomin & Walker, 2003). Results have indicated roughly equal contributions of nature and nurture on a range of educationally relevant traits. However, much more work is needed to integrate research on both genetic and environmental factors and translate these findings into educational implications, such as individually tailored learning. (e.g., Chen, Lee, & Chen, 2005, p. 259)

Research on schools and schooling has largely neglected the effects of nonshared environment, in particular, focusing instead on school-, classroom-, and family-level influences. Research on nonshared environmental effects, in contract, would focus on

students' perceptions or experiences of those environments, or differences in the environments to which they have been exposed. Results of such research could lead to more effective interventions within multitiered systems of support, particularly at Tier 3, where students received more intensive and individualized support suited for their unique learning needs.

It is also important to note that school psychologists do not practice alone in schools nor are researchers in school psychology experts in every area. With this in mind, we believe that the use of a biopsychosocial model as an overarching framework necessitates a greater emphasis in the field of school psychology on interdisciplinary collaboration than at present. Multidisciplinary research teams including school psychologists, geneticists, pediatricians, developmental psychologists, clinical sociologists, and applied anthropologists, among others, all have much to offer. The best opportunities for success will result from the synergy created between researchers in school psychology and those in other disciplines.

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