



Special Issue Article

The Future of Developmental Psychopathology: Honoring the Contributions of Dante Cicchetti

Developmental psychopathology turns 50: Applying core principles to longitudinal investigation of ADHD in girls and efforts to reduce stigma and discrimination

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Abstract

The seminal contributions of Dante Cicchetti to the field/paradigm/metaparadigm of developmental psychopathology (DP) – and its continuing ascendancy as a guiding force for multidisciplinary investigation of normative and atypical development – are legion. Our aim is to illustrate a number of DP's core principles in the context of (a) prospective longitudinal research on children (particularly girls) with attention-deficit hyperactivity disorder and (b) theoretical and empirical work dedicated to alleviating the stigma and discrimination toward those experiencing mental health, substance use, and neurodevelopmental challenges. We feature (i) the mutual interplay of perspectives on normative and non-normative development, (ii) reciprocal and transactional processes, and the constructs of *equifinality* and *multifinality*; (iii) continuities and discontinuities in developmental processes and outcomes, with particular focus on *heterotypic continuity*; (iv) the inseparability of heritable and environmental risk; (v) multiple levels of analysis, and (vi) the benefits of qualitative perspectives. We highlight that interventions promoting recovery, along with the multi-level facilitation of protective factors/strengths, lie at the heart of both DP and anti-stigma efforts. The ongoing youth mental-health crisis provides a sobering counterpoint to the gains of the DP enterprise over the past half century.

Keywords: attention-deficit hyperactivity disorder; developmental psychopathology; stigma

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Introduction

This final issue of the longstanding term of the founding editor of *Development and Psychopathology*, Dante Cicchetti, prompts celebration, related to the stunning progress of this endeavor over the past half century. Achenbach (1974) provided the initial book on this topic, now 50 years of age. Yet the still-ascending mental-health crisis confronting children, adolescents, and young adults in today's world prompts realization of the long journey ahead. Our core aim is to illustrate key principles of the developmental psychopathology (DP) approach, in the context of (a) life-span research on youth (often girls) with the key features of attention-deficit hyperactivity disorder (ADHD); and (b) ongoing theoretical and empirical work related to reducing the stigmatization toward and discrimination against individuals with mental health and neurodevelopmental differences.¹ We hope that readers can synthesize the information below to apply DP perspectives to areas far beyond the two under current consideration. Integrating such principles with deep appreciation of (1) income inequality,

¹Whether DP is a discipline, approach, paradigm, or meta-paradigm is discussed in depth, and with great sophistication, by Beauchaine (2024, this issue).

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structural/racial discrimination, and other social determinants (now often termed “drivers” – see Brown & Homan, 2023) of health; (2) modern genetic and epigenetic approaches, plus state-of-the-art neuroscience; and (3) sophisticated quantitative modeling – to name three crucial examples – is required to understand and advance the field in relation to mental and neurodevelopmental challenges.

By way of background, through inspiration from Cicchetti (1984, 1989, 1990) and other DP founders, at the beginning of his career Hinshaw launched several programs of research – experimental, longitudinal, and clinical trials focused on understanding mechanisms of change. For conceptual background and orientation, see Hinshaw (1987, 1992). Moreover, in 1993 he established the first-ever course entitled “Developmental Psychopathology” at the University of California, Berkeley. Many iterations later, during the second decade of the 21st Century, post-baccalaureate students Shaikh Ahmad and Patricia Porter took this course, several years apart. Both subsequently became doctoral students within the Psychology Department's Clinical Science program, under Hinshaw's mentorship. Their own programs of research have been infused with DP guidelines, models, and principles. Our hope is that a selective review of key findings in relation to DP principles and processes may be heuristic for future generations of DP investigators and for the urgently needed expansion of prevention and intervention efforts.



Developmental progressions of girls with (and without) ADHD

During the 1990s, Hinshaw became interested in sex differences related to manifestations of and mechanisms underlying psychopathology (for an elegant exposition, see Rutter et al., 2003; see also Hartung & Lefler, 2019). In particular, despite a long history of neglect of female manifestations of ADHD in both science and clinical practice (Arnold, 1996; see also the more recent summations of Young et al., 2020, and Hinshaw et al., 2022), he and his lab wrote a successful grant application to the National Institute of Mental Health. The proposal was to deploy, with girls, the ecologically valid summer-camp model used with boys experiencing ADHD, expanding office-based clinical assessments to classroom and playground settings, peer sociometric evaluations,² small-group interactions, and experimental manipulations (for a key example of the latter from prior all-boy programs, see Hinshaw et al., 1992). These programs placed a premium on observation from multiple perspectives and multiple informants. We prioritized obtaining valid information on dimensional features of ADHD, plus viable indicators of real-life impairments. Three programs were conducted, in 1997, 1998, and 1999.

All participants were between 6 and 12 years of age at baseline. Sample composition was diverse regarding both race/ethnicity and socioeconomic status: Nearly half of the sample was non-White, and participating families ranged widely in terms of socioeconomic status from receipt of public assistance to professional-level employment. Of note, the screening and diagnostic procedures featured recruitment of an age- and race/ethnicity-matched sample of neurotypical comparison girls, who were intermixed with the ADHD sample for nearly all program activities, with staff unaware of diagnostic status.

We used a multi-gated procedure for establishing a valid diagnosis of ADHD in the clinical sample, essential for NIH grants prior to the Research Domain Criteria (Insel et al., 2010). That is, to prevent false negatives, we used an intentionally low threshold of ADHD symptoms in the initial phases of phone screening and adult-informant-rating-scales. Yet final diagnostic criteria for the ADHD group encompassed a sex-neutral diagnostic threshold via structured parent interview, supplemented by teacher-reported classroom behavior patterns. (For current criteria, see American Psychiatric Association, 2022; debate continues about whether ADHD in girls should be diagnosed with respect to sex-specific or sex-neutral norms.) The final sample included 140 girls with ADHD, 93 with ADHD-Combined presentation (featuring both inattention and hyperactivity/impulsivity) and 47 with ADHD-Inattentive presentation, plus 88 neurotypical comparisons.

As is well known, the typical cycle of federal research grants encompasses a 5-year span for each award. At the outset, we knew that only through valid data collection and ample publication of our baseline data could we justify further funding for prospective follow-up investigations. Nonetheless, at pre-camp orientation meetings, we told all families that our intention was to follow their daughters for the rest of their lives. Setting this expectation proved helpful in terms of family and participant investment in subsequent waves, as evidenced by repeated comments, over time, about their strong desire to participate in follow-up visits.

Baseline (Wave 1) analyses established the clear impairment experienced by girls with ADHD across a wide array of functional domains, appraised by multiple methods and informants. In short, ADHD was real and significantly impairing in girls. In nearly all

domains, girls with the Inattentive presentation of ADHD were statistically equivalent to those with the Combined presentation, with key exceptions that the latter evidenced higher rates of aggressive behavior and peer rejection. For detailed examination, see Hinshaw (2002). Furthermore, Hinshaw et al. (2002) analyzed clear deficits in executive function displayed by the ADHD sample, which were also statistically equivalent, on average, between the two presentations. A number of additional publications ensued. Exemplars include investigations of friendship and peer rejection (Blachman & Hinshaw, 2002; Mikami & Hinshaw, 2003); patterns of overt vs. relational aggression (Zalecki & Hinshaw, 2004); family interactions, including expressed emotion (Peris & Hinshaw, 2003); and consideration of global indices of executive function, specifically regarding a new, validated scoring system for the Rey-Osterrieth Complex Figure (ROCF; see Sami et al., 2003).

As a result, we secured funds for a second wave of data collection five years later (see Hinshaw et al., 2006, for an overview, with evidence for continuing impairment across all sampled domains of functioning; and Hinshaw et al., 2007, for neuropsychological findings). We subsequently received competing renewals for Wave 3, ages 17–23 (e.g., Hinshaw et al., 2012), and Wave 4, ages 22–29 (e.g., Owens et al., 2017), extending into emerging and early adulthood. The investigation became known as the Berkeley Girls with ADHD Longitudinal Study (BGALS). Sample retention rates were excellent, ranging from 92 to 95%, which we attribute to the provision of a free-of-charge summer program at Wave 1, a history of respectful and warm interactions with participants and families over the years, detailed written reports and ongoing advocacy, and a project-wide emphasis on working diligently (including via social media) to maintain continued contact. At present, we are completing a COVID-pandemic-delayed Wave 5 assessment protocol, with participants currently in their 30s.

Before proceeding to the application of DP principles to key longitudinal findings, we highlight a core issue (and conundrum) for those embarking on prospective research. That is, to aid and abet the principle of measurement invariance, we invoked the adage that “if you want to measure change, don’t change the measure” (thanks to our colleague Bernice Pescosolido for reminding us of this dictum). We therefore kept many identical (or parallel) assessments intact across waves. Still, longitudinal investigators must anticipate developmental changes that occur as a sample matures, realizing as well that an overzealous follow-up battery may compromise motivation and valid responding. A perennial battle exists between (a) the “pruning” of now out-of-date measures, (b) keeping parallel measures intact to the greatest extent possible, and (c) adding developmentally salient constructs and assessments as participants mature through adolescence and beyond. For exemplars of BGALS longitudinal investigations featuring identical/parallel measures across waves, see: Gordon and Hinshaw (2020) and Miller et al. (2012), relevant to neuropsychological performance; Ahmad and Hinshaw (2017), related to patterns of externalizing behavior across time, moderated by childhood authoritarian parenting; and Porter et al. (2022), on increasing body mass index trajectories from Wave 1–4.

Interplay between typical and atypical development

An initial tenet of the DP approach was that, to understand deflections from “typical” trajectories that characterize mental and neurodevelopmental conditions, investigators must have extensive knowledge of normative processes and pathways. In other words, every effort must be made to understand typical development if the aim is to understand deviations from such development (see

²In a summer-camp setting housing previously unfamiliar participants, the value of sociometrics is enhanced because peer preferences are uncontaminated by prior reputations.

Hinshaw, 2017b). At the same time, such knowledge may be greatly aided by rich understanding of psychopathology or neuropathology. For example, we note the significant leaps in our understanding of the hippocampus in memory consolidation via the surgery of H.M. for intractable seizures, or knowledge of the functionality of the frontal lobes in emotion regulation emanating from the classic case of Phineas Gage (e.g., Gazzaniga et al., 2018). Knowledge traverses a two-way street, whereby understanding of typical and non-normative processes is mutually informative (Hinshaw, 2017b).

Space does not allow adequate coverage of the many ways in which such mutual perspectives have informed understanding of ADHD. Taking a key example outside our lab's research, the longitudinal structural imaging investigation of Shaw and colleagues (Shaw et al., 2006, 2007), with participants including youth both with and without ADHD, revealed that the age of the maximum thickness of the prefrontal cortex in neurotypical children is about 6 years – following the massive pruning in the first two years of life and prior to the subsequent pruning of the preadolescent/adolescent/young-adult years. Second, in their mixed-sex sample of children with what would today be termed the Combined presentation of ADHD, such cortical maturation was delayed, on average, by 3–4 years. Thus, the behavioral and emotional immaturity of many youth with this condition may well be undergirded by actual deficits in neural maturation, with such trends continuing beyond childhood and early adolescence (e.g., Shaw et al., 2006, 2007, 2013).³

In the initial BGALS follow-up (Wave 2), spanning early to mid-adolescence, ADHD vs. neurotypical differences in symptoms and impairments persisted for nearly all measured variables (Hinshaw et al., 2006), yet a number of our comparison girls had developed problems with adjustment, including substance use concerns, binge eating, and emotion dysregulation. By Wave 3, rates of self-inflicted violence (traditionally termed self-harm) were high, though still well below those of the ADHD participants. Along with close reading of the relevant empirical literature, such findings led to the conclusion that girls without neurodevelopmental concerns were showing earlier onset and enhanced prevalence of key internalizing features. The time frame of such trends was far too short to posit any kind of genetic change as the culprit, such that cultural factors are bound to be implicated. In short, a book-length exposition on the topic (Hinshaw and Kranz, 2009) was directly inspired by examination of our neurotypical, low-risk subsample.⁴

³In passing, we note that the phenomenon of hyperfocus, present in many individuals with ADHD when performing highly motivating tasks, signifies that the very term ADHD is a misnomer. In fact, the so-called “attention deficit” actually signifies a deeper, dynamic process regarding the dysregulation of attention as situational demands and contingencies change.

⁴In brief, the thesis of a “triple bind” is that, first, throughout history, nearly all cultures have encouraged girls to be nurturing and compassionate, in preparation for eventual roles as mothers. Second, however, since the civil rights/human rights and women's movements of the 1960s and beyond (e.g., Title IX of the Civil Rights act), there has been a major press for girls to achieve, academically and athletically – presenting a conundrum: How does one win the award or race while helping to aid a struggling peer? Third, the current expectation is that girls must traverse this precarious bind in an effortless and highly sexualized manner. Doing so, of course, is physically and psychologically impossible. Moreover, such expectations mount just as pubertal development proceeds. Learned helplessness, decrements in self-esteem, reduced sleep, and impairments in executive functions (given the need to focus on body image) may all ensue. Tragically, nearly every prediction in Hinshaw and Kranz (2009) has been realized (actually, surpassed) over the past 15 years, culminating in the current major crisis in teen and young-adult mental health, particularly in girls. Lacking an accurate crystal ball, Hinshaw and Kranz (2009) did not anticipate the steep rise in the more pernicious forms of social media in the second decade and third decades of the 21st century – which influence boys' mental health minimally but girls' mental health far more significantly (e.g., Twenge et al., 2022; for conflicting views on the influence of social media on adolescent development, see Odgers, 2024). Finally, for those already at high risk related to neurodevelopmental conditions, underlying vulnerabilities would only be magnified through the pernicious pressures of the triple bind.

Reciprocal and transactional processes (including equifinality and multifinality)

DP efforts comprise an explicit attempt to transcend general developmental theories/paradigms through explicit consideration of individual differences in vulnerabilities (for example, temperament and attachment), in combination with a range of more proximal risk factors. That is, reciprocal interactions, plus the influence of maintaining factors, may well “track” certain youth into less-than-adaptive developmental trajectories. In a classic work, Bell (1968) upended the traditional view that parent-to-child socialization was the basis of nearly all developmental outcomes through his cogent review of how children's behavior can produce alterations in parenting, as well as the converse. In fact, such repeated reciprocal patterns of child-to-parent and parent-to-child patterns undergird *transactional* models of development.

From the classic article of Baron and Kenny (1986), risk factor/outcome research entails the search for *moderators* and *mediators*. In short, moderators are baseline variables that alter or qualify risk factor/outcome associations, whereas mediators signify processes occurring temporally between risk factors/outcomes that clarify pathways leading to such outcomes. Subsequent clarification and elaboration is provided by the MacArthur group regarding clinical trials (see Kraemer et al., 2008). Such processes may involve intraindividual variables as well as interactions/transactions with wider systems-level variables (see subsequent section on Multiple Levels of Analysis).

Returning to the BGALS investigation, we made important yet troubling discoveries by Wave 3, with the inclusion of measures of new constructs. Core here were indicators of self-inflicted violence, involving both the attempt to end one's life (suicidal behavior) and self-destructive behavior patterns lacking such explicit intent but involving bodily harm intended to deflect or modulate psychological pain (non-suicidal self-injury, or NSSI). Our initial Wave 3 report (Hinshaw et al., 2012) revealed that, by emerging adulthood, over 22% of the girls with childhood-diagnosed ADHD-Combined had made a serious attempt on their lives, compared to 8% of those with childhood ADHD-Inattentive and 6% of the neurotypical comparison sample. Regarding moderate to severe levels of NSSI, the respective rates were 51, 29, and 19%. Such findings have been reflected in a number of samples across multiple countries (e.g., Chronis-Tuscano et al., 2010; Fitzgerald et al., 2019; see review in Hinshaw et al., 2022).

In initial mediator analyses, Swanson et al. (2014) found that the path from childhood ADHD (defined either categorically or dimensionally) to attempted suicide by Wave 3 was significantly and partially mediated by mid-adolescent internalizing symptoms, but the parallel path to NSSI was significantly and partially mediated by mid-adolescent (a) externalizing symptoms and (b) a neuropsychological test of response inhibition. Thus, diverging mechanisms and differing transactional pathways to indicators of self-inflicted violence appear salient.⁵

Regarding peer relationships, Meza et al. (2016) showed that the path from childhood ADHD to attempted suicide was significantly and partially mediated by teacher-reported peer rejection during mid-adolescence (Wave 2), whereas the parallel path to NSSI encompassed participant-reported peer victimization, both relational and physical (bullying).

⁵These mediator pathways, parallel to all others discussed throughout this article, were robust to stringent statistical adjustment of participant age, family-of-origin socioeconomic status, and in many cases childhood full-scale intelligence.

In a subsequent study of childhood predictors of self-inflicted violence by early adulthood (Wave 4), Meza et al. (2021) discovered that a range of baseline variables – low self-esteem, parent-child conflict (particularly with fathers), adverse childhood events, and our indicator of global executive dysfunction from the ROCF (Sami et al., 2003) – were relevant. Notably, this investigation revealed evidence for interacting risk factors. For example, in the prediction of NSSI by young adulthood, the child-level variables of (a) clinical-range Internalizing behaviors plus (b) extremely poor global EF were salient. Specifically, fully 80% of participants with high scores on this risk-factor combination reported subsequent NSSI. Such interactive processes convey the importance of multifactorial patterns related to clinically meaningful outcomes – in this case, anxiety/depression/social isolation along with poor overall cognitive control/planning. Even more, as highlighted subsequently, despite the strongly heritable nature of ADHD, environmental and developmental processes – particularly related to trauma – matter considerably with respect to essential outcomes (see also Nigg et al., 2020, for a comprehensive account of early risk factors related to ADHD).

In other BGALS investigations, our team found that the ADHD group had roughly four times (43%) the rate of unplanned pregnancies by early adulthood – even if their ADHD symptoms had largely remitted beyond childhood – than did their neurotypical peers (11%; Owens et al., 2017), a key finding in and of itself. Via further examination, Owens and Hinshaw (2020) performed serial mediation from childhood (Wave 1) ADHD status, through potential adolescent mediators (Wave 2), then Wave 3 engagement in risky sexual behavior, and finally to the presence of unplanned pregnancies by early adulthood (Wave 4). The significant adolescent mediators were (a) low academic achievement in reading and math, measured via objective tests; and (b) substance-use frequency. With both entered in the same model, only poor achievement remained significant. As well, the ADHD sample experienced far higher rates of intimate partner victimization by Wave 3 than did neurotypical peers: 31 vs. 6% (Guendelman, Ahmad et al., 2016). Once again, the key adolescent mediator of this predictive association was Wave 2 underachievement, assessed via standardized reading and math tests. In sum, the negative consequences of childhood ADHD regarding current and subsequent academic performance are well established (e.g., Hinshaw, 1992) – but less appreciated may be the long-term sequelae of underachievement itself with respect to important later-life outcomes. Additional prospective research could help to elucidate relevant pathways.

In the most sophisticated BGALS serial mediation analysis, Owens and Hinshaw (2016) envisioned a set of pathways examining relations between childhood neurocognitive vulnerability and psychopathology in early adulthood. The baseline risk factor of neurocognitive vulnerability comprised a combination of poor performance on our global EF measure (Sami et al., 2003) plus a teacher-reported scale indexing academic risk. The early-adult criterion measure of psychopathology was a composite of high internalizing *and* externalizing scores from the Adult Behavior Checklist and Adult Self Report (Achenbach & Rescorla, 2003). Indeed, in the BGALS sample, it was rare for participants to display only high internalizing *or* externalizing scores by adulthood (see the surge of research on the general psychopathology, or *p* factor; Caspi & Moffitt, 2018; Southward et al., 2023). We stringently tested a range of theory-based mediators during adolescence and emerging-adulthood (Waves 2 and 3) across individual, academic, and peer relational domains, with two significant paths emerging.

First, childhood neurocognitive vulnerability was “expressed” through (a) early-adolescent poor academic performance and (b) emerging-adult school failure in the prediction of high levels of this internalizing plus externalizing comorbid pattern. The second mediator chain involved poor adolescent self-control and low ability to delay gratification at Wave 3. Intriguingly, such indirect effects were moderated by parental distress during childhood/early adolescence – such that, under high distress, the serial indirect effects were weaker than when parental distress was low. Perhaps high levels of parental distress induce more environmentally determined (and potentially malleable) paths to adult psychopathology, a hypothesis mandating further examination.

Finally, in the context of transactions, we briefly highlight two key constructs, *equifinality* and *multifinality* – both of which have origins in other disciplines (e.g., embryology, systems theory) and subsequently embraced by DP (Cicchetti & Rogosch, 1996). Equifinality posits that disparate developmental processes may converge on phenotypically similar outcomes, such as a given type of psychopathology. In other words, multiple roads can lead to Rome. Via multifinality, similar initial states (e.g., risk factors) do not necessarily lead to the same specific end-states, given that additional risk and protective factors may mediate eventual outcomes across different youth through transactional processes.

Despite the stringent application of structured-interview-based algorithms to yield our final diagnostic sample, the vastly different social strata, parenting styles, school contexts, and undoubted genetic variability within the ADHD sample signify strong heterogeneity. Additionally, as a brief case example, we note a BGALS participant in the ADHD-Combined group, who scored at the top of the scale for every single ADHD symptom at Wave 1. She had been born in the 1980s with a birthweight of 1 pound, 12 ounces. An established literature exists on birthweight/ADHD linkages, especially when birth weight is extremely low (Pettersson et al., 2015). Many such infants of that era did not live past infancy, although advances in neonatal intensive care units have subsequently enhanced survival rates. Intriguingly, this participant – potentially via intensive interventions she and her family received outside of the BGALS protocol – is an extremely successful adult, interpersonally and professionally, showing clear evidence of resilience. Overall, the huge range of long-term outcomes amid our ADHD sample parallels follow-up investigations of many other emotional/behavioral conditions, including depression, bipolar disorder, schizophrenia, autism spectrum disorders, and more. Reciprocal, non-linear, transactional, and multifinal processes are clearly at play.

Continuities and discontinuities (especially heterotypic continuity)

In DP, one meaning of continuity relates to populations: Across distributions of emotional, behavioral, and cognitive factors underlying the current psychiatric and neurodevelopmental nomenclatures, there are extremely few “breaks” in the relevant continua (and such is clearly the case for ADHD). The underlying dimensions are instead most often “smooth,” such that any specifications of clinical groups are relatively arbitrary in terms of symptom scores. Deciding who has a disorder involves knowledge of context, “fit” within ecological systems, and degree of impairment.

The second perspective on continuity/discontinuity refers to individual-child trajectories across time, where distinctions can be made between continuous (linear, quantitative) vs. discontinuous

(stage-like) progressions. Such demarcations are often a function of the time scale of observations. Height, for example, may appear continuous across large periods of development – children grow taller with age – but narrower timeframes reveal spurts of growth (e.g., coincident with pubertal timing).

Regarding psychopathology, related issues are even more contentious. For height, to prolong this example, a centimeter is a centimeter across the lifespan. Yet what about aggression/externalizing behavior? Or dysregulated attention? Or components of internalizing psychopathology (anxiety, dysphoric mood, social withdrawal)? One can argue that valid indicators of such tendencies during toddlerhood and the preschool years may well change by middle childhood, adolescence, or beyond. In the externalizing domain, the tantrums of the toddler years – if extreme – often morph into the verbal aggression of the preschooler toward teachers and peers, physical attacks against classmates (or parents) predominating in grade school, and potentially into expression of covert forms of antisocial behavior, or of sexual assault, during the teen years.

When high rates of early tantrums predict high rates of the same behavior patterns across development, *homotypic continuity* is apparent: The stability of an identical or nearly identical form of behavior across development. Yet if the form/expression of an underlying propensity or trait, changes with age, given increased verbal skills, physical strength, and interpersonal contacts exhibited across wider territories, continuity may well still be present. Such occurrences signify *heterotypic continuity* – the stability of an underlying tendency for which phenotypic expression changes over time.

Consider our previous discussion of the developmental outcomes of girls with ADHD from the BGALS sample. Whereas boys with ADHD often proceed to trajectories of externalizing behavior patterns and substance use issues as they mature, more frequent long-term outcomes in our investigation were (a) development (or intensification) of internalizing problems, especially depression (Guendelman, Owens *et al.*, 2016; Owens *et al.*, 2017) and (b) involvement in self-inflicted violence, including suicidal behavior and/or NSSI (Hinshaw *et al.*, 2012; Meza *et al.*, 2021; Owens *et al.*, 2017). As noted, rates of unplanned pregnancy and intimate partner violence were also disturbingly high. Per Beauchaine and McNulty (2013), what may at first appear to be a progression through seemingly independent forms of mental disorder over time (i.e., serial comorbidities) may instead indicate ontogenic processes in high-risk youth, whereby developmental processes propel heterotypically continuous manifestations of underlying executive dysfunction and trait impulsivity. Overall, psychiatric classifications of discrete, independent “disorders” may actually bespeak developmental progressions, for many high-risk young people, through heterotypically continuous patterns of internalizing psychopathology – or in the case of self-inflicted harm, a troublesome blend of internalizing (low self-concept, depression) and externalizing (aggression directed against the self) behavior.

Multiple levels of analysis

A commonly pursued theme, often comprising an aspirational goal, in expositions of DP is the examination of developmental processes ranging from molecular, brain-related, and behavioral (i.e., intraindividual), on the one hand, to widening spheres of influence, including familial, peer, school, neighborhood, community-wide, and even cultural and policy units (e.g., Cicchetti & Dawson, 2002), on the other. The essential point is that developmental processes linked with “micro” levels of analysis

are necessarily shaped and molded by factors and transactional processes at more “macro” levels. Examining such linkages is the ultimate goal of clinical and developmental science as well as prevention and intervention efforts. Few investigations can incorporate more than a few such levels simultaneously, but the potential for conceptual and clinical advances is heightened when influences at different levels can be integrated and synthesized. Indeed, in DP models, understanding how systems-level influences get “underneath the skin” with respect to physical and mental health is a crucial objective.

As for peer-level processes, our research on boys with ADHD, utilizing the above-noted naturalistic summer-camp methodology, probed how quickly the peer rejection so often accruing youth with ADHD actually occurs. Through intensive observations of discrete behaviors in classroom and outdoor settings beginning on Day 1, along with confidential peer sociometric interviews performed on Days 1, 3, and 5, Erhardt and Hinshaw (1994) were able to track the formation of peer reputations in previously unfamiliar boys, half with ADHD and half neurotypical. By the end of Days 1 and 3, the ADHD sample received over four times more peer rejection than the comparisons (again, boys had never met before the camp program, and participants and staff were unaware of diagnostic status). Behavioral observations revealed that the strongest predictor of such fast-originating peer rejection was the display of reactive aggression during the program’s initial days, accounting for approximately half of the variance in the quick accrual of peer rejection. Such behavior patterns far outstripped “usual suspects” as predictors of peer regard, including physical attractiveness, athletic ability, IQ scores, or academic performance.

In a clinical vein, beyond ADHD symptoms *per se*, aggressive behavior and peer regard are crucial intervention targets. Additionally, for clinicians/schools/families working with relevant youth, we urge that a school year not begin in the absence of previously successful interventions (e.g., well-titrated medications; active home-school behavior programs). Starting off on the wrong foot may promote quick and lasting negative impressions.

Regarding BGALS, Blachman and Hinshaw (2002) used peer sociometric methods to probe the development of friendships, operationalized as reciprocal patterns of positive nominations between one girl and another. That is, to be counted as friends, a given pair of girls had to independently nominate each other positively. Whereas classic sociometric literature emphasizes the strongly predictive power of peer rejection to later difficult outcomes (both internalizing and externalizing), the classic work of Hartup (1996) illuminates that high-quality friendship is crucial, even the context of peer-rejected status (e.g., Sanderson & Siegel, 1995). Key findings were that girls with ADHD had fewer mutual friends (and were more likely to have no friends) than neurotypicals during the summer programs. Even more, when present, their friendship patterns were less stable than those of the comparisons. As well, girls with ADHD had higher levels of negative relationship features (e.g., conflict; relational aggression), whereas positive relationship features were similar to those of the comparison peers.

At the level of parenting practices and styles, we present two additional examples. Amalgamating data across several years of summer programs for boys with ADHD, Hinshaw *et al.* (1997) aimed to discover predictors of positive peer adjustment (i.e., peer acceptance) from end-of-camp sociometric appraisals. One potential predictor was a parent-reported scale of authoritative parenting, comprising a blend of warm/responsive, firm/controlling, autonomy-encouraging, and democratic practices (Smetana,

2017). First, with a large effect, the primary caregivers of our neurotypical boys scored much higher than the caregivers of the ADHD sample with respect to this variable. In short, it is not easy to be warm/limit-setting/democratic when raising a child with ADHD, especially when impulsive behaviors compound inattention. Second, however, compared to data-dense daily summer-camp ratings and observations of the boys' behavior at each program, authoritative parenting scores were the strongest predictor of end-of-camp sociometric popularity/social competence – but only for the ADHD sample. In fact, the comparable effect size was essentially zero for neurotypical peers. Overall, the “firm yet affirming” parenting style termed authoritative was a protective factor in terms of peer-appraised social competence for boys with the neurodevelopmental challenges presented by ADHD, providing another potential example of a transactional process at play. Indeed, authoritative parenting may well be a protective factor for youth with ADHD.

Yet skeptical readers may rightfully raise the argument that in this sample, largely constituting biological families, genetic similarity rather than any causal influence of parenting was at play. We hasten to cite the important work of Harold and colleagues from the United Kingdom (2013b, Harold et al., 2013a; Sellers et al., 2021). Here, in large samples of adopted children, those with early ADHD were met with harsher, less authoritative practices than were the adopted youth without ADHD, signifying reciprocal influences of child behavior on parenting styles. Crucially, such parenting, over time – even when adjusting statistically for the child's early ADHD symptoms – predicted impairments in terms of psychiatric and educational outcomes. The essential point is that the sampling frame, comprising adoptive families, removed gene-environment correlation from the predictive associations (see Harold et al., 2013b). In short, even though parenting is typically not causal of ADHD symptoms, it may still be highly influential in terms of their maintenance and spread to crucial, negative outcomes – and even in terms of fostering strengths.

Crucially, in a randomized clinical trial comparing medication and behavioral therapy (and their combination) for a large sample of children with ADHD-Combined – the Multimodal Treatment Study of Children with ADHD, comprising 80% boys – Hinshaw et al. (2000) examined whether changes in parenting style during the course of 14 months of active intervention would mediate school-based outcomes. In brief, when parents made major reorientations of their styles toward a more authoritative stance during the treatment period, their offspring fared better in terms of school indicators of behavior than did parents who were not able to utilize more authoritative parenting practices. This finding was particularly salient for children receiving the combination of optimal medication and behavior therapy, strongly suggesting that parenting *does* matter for influencing child-level change. Although we highlight this finding in the current segment featuring multiple levels of analysis, it would fit equally well within our section on reciprocal and transactional processes.

From BGALS, Gordon and Hinshaw (2017) discovered that stress in the parenting role, rather than overt parent-child conflict or parenting styles per se, was a salient predictor of key long-term negative outcomes. That is, for parents of a girl who is disorganized, forgetful, poorly regulated, and perhaps ornery, it may be a real challenge to come to terms with such behaviors. Caregivers may come to experience an imbalance between the demands of parenting such a child and any immediate rewards accruing from such parenting. In fact, levels of stress in parents of youth (particularly girls) with ADHD are disturbingly high.

In sum, regarding females with ADHD, clinicians and investigators are cautioned to look beyond overt, visible parent/child conflict and expressly consider parenting stress and its potential, more subtle, consequences.

Finally, we jump to social policy (Fulton et al., 2015, Hinshaw & Scheffler; 2014; see Hinshaw, 2018, for a summation). Beyond the strong genetic liability for ADHD, large increases in the diagnosed prevalence of ADHD in the U.S. have occurred for several decades. Moreover, huge state-by-state differences in such diagnosed prevalence exist – specifically, far higher rates in Southern than in Far West states. Our examination revealed evidence for an unintended consequence of legislation falling under the rubric of “consequential accountability.” Laws in this domain reward public school districts when standardized test scores in reading and math increase or reach a certain threshold but penalize districts with flat or decreasing scores. In the 1980s and 1990s, a number of states passed such legislation, with a federal mandate affecting the remaining states during the early 2000s.⁶ Major pressure to diagnose low-income youth with ADHD emerged, both to improve service access but also to falsely boost a district's standardized test score levels, given that an ADHD (“special education”) diagnosis would remove a child from the district's test-score pool. Beyond heritable or other biological influences on the genesis of ADHD, real-world prevalence may reflect school-related policies and cultural priorities. Finally, direct-to-consumer advertisements – banned in the U.S. prior to 1999 – soared for psychotropic medications in the early 21st century, adding another systems-level spur toward increased diagnosis (see Hatzenbuehler, 2016, for parallel work on the influence of state policies related to sexually minoritized youth, revealing major influence on rates of internalizing psychopathology).

Heritable and environmental vulnerability and risk

As discussed above, a key BGALS finding pertained to high rates of self-inflicted violence in the ADHD sample, especially for those with the Combined presentation.⁷ Placing such findings in context, we note that heritability estimates for ADHD range from .74 to .80 for the symptom dimensions of inattention and hyperactivity-impulsivity, and from .77 to .88 for categorical ADHD diagnosis (Faraone & Larsson, 2019; Thapar, 2018). Underexplored, however, is the role of trauma in exacerbating such heritable risk with respect to outcomes related to comorbidity and suicidality. Note that, in the recent work of Daniélsdóttir et al. (2024), a discordant twin study design revealed *environmental* rather than heritable roles of adverse child experiences in explaining later psychiatric outcomes.

First, in Guendelman, Owens et al., (2016), we reported that, regarding attempted suicide by Wave 3 within the childhood-diagnosed ADHD sample, a third of the participants with childhood histories of physical abuse, sexual abuse, and/or neglect had made a suicide attempt (33%), as opposed to 13% of the

⁶Since the 1980s, when it had become clear that standardized test scores were plummeting in the U.S., a number of states began to enact such consequential accountability laws. Then, in 2002, enactment of the federal No Child Left Behind legislation mandated such statutes in the remaining states. Via this experiment of nature, Hinshaw and Scheffler (2014) compared effects of such legislation on rates of ADHD diagnosis, particularly for the lowest-income children in a given state, given that Title I public schools disproportionately serve impoverished youth. The recent passage of such legislation led to spikes in ADHD diagnosis for low-income youth in relevant states, compared to rates for (a) middle- or upper-income youth in those states or (b) private school attendees (private schools were not subject to No Child Left Behind).

⁷In analyses from Meza et al. (2021), featuring Inattentive vs. HI symptom dimensions, childhood inattention was also a significant predictor of some forms of self-inflicted injury by Wave 4, though not as strong as was HI.

non-maltreated ADHD participants. This significant difference survived stringent covariation of (a) participant age, (b) family-of-origin socioeconomic status, (c) a prenatal risk index, (d) whether participants had been adopted or in foster care, and (e) diagnosis of depression and/or anxiety disorder in childhood. In new analyses for this article, we found parallel findings for lifetime suicide attempts by Wave 4, with corresponding percentages of 35% vs. 14%, with parallel covariates in the model, yielding an adjusted odds ratio of 3.48 ($p < .05$). We note, however, that NSSI, ascertained at either wave, was not significantly related to earlier maltreatment.⁸

Second, across large samples and multiple cultures, it is now well documented that bipolar disorder yields heritability statistics parallel to or even higher than those for ADHD (O'Connell & Coombes, 2021). Even so, experiences of early trauma – especially physical abuse but also high numbers of overall adverse childhood experiences – magnifies the already extraordinarily high rates of suicidality associated with this condition (Brown et al., 2005; Park et al., 2020). Exemplifying DP perspectives, the overall conclusion is essential: Even for dimensions and conditions with extremely strong genetic risk (heritability), including ADHD as well as bipolar disorder, early traumatic experiences are essential to take into account in predicting serious consequences, particularly suicidal behavior but also including psychiatric comorbidities (Guendelman, Owens, et al., 2016; Park et al., 2020).

In sum, reductionism – in the form of explanations to “all genetic” or “all experiential” factors – is not a valid or evidence-based stance either conceptually or clinically. Understanding the complex genetics of mental and neurodevelopmental conditions – operating in transaction with a range of environmental risks, maintaining variables, and protective factors – is the aspirational goal for the next waves of DP in explaining both (a) the major impairments that are so often linked to psychopathology and neurodevelopmental conditions and (b) the potential for resilient outcomes (see Masten, 2019).

The importance of qualitative perspectives on risk and protection

Although not typically posited as a core DP principle, we contend that the first-person, narrative perspectives of individuals experiencing mental and neurodevelopmental conditions can be crucial for future advances. Space does not permit elaboration of qualitative/mixed-method approaches (see Kleinman, 1988; Malterud, 2001), but we believe that such accounts of behavioral and emotional patterns, impairments, experiences, and treatment-related phenomena can enhance the next generations of psychological science and developmental psychopathology. We specifically highlight recent findings from BGALS (Ahmad & Hinshaw, 2024), wherein we recruited a subset of the sample between Waves 4 and 5, when participants were in their late 20s, for in-person, open-ended qualitative interviews during which participants discussed their past experiences and perspectives on self-inflicted violence.

Some findings were consistent with extant research, such as common reasons for (and functions of) NSSI, including affect regulation, asserting control, attention-seeking, and self-punishment, with the potential for peer interactions to act as either a risk

⁸For another perspective on adverse childhood experiences in the BGALS sample, see Nguyen et al. (2022), who used inclusive latent class analysis to yield four profiles of ACEs experiences: Low exposure, family dysfunction, maltreatment, and a relatively small group of experiencers of pervasive adverse events. The profiles revealed differential predictions to outcomes of persistence of ADHD and comorbidity.

or protective factor. Additional qualitative findings revealed that reasons for engaging in NSSI were often multiple – and frequently changing over time. In addition, despite high variability, reasons and motivations for persistence and desistance followed a few patterns, all of which highlight aspects of equifinality and multifinality along with the heterotypic continuity of many forms of mental disorder (Ahmad & Hinshaw, 2024). Furthermore, some individuals discussed how family and friends were instrumental in helping them desist in such behaviors, highlighting an important protective factor bearing additional study with respect to intervention and prevention efforts. As well, most of those who engaged in NSSI tried to hide it from others, often related to stigma and shame associated with having a mental illness (see next section) but also because of not knowing how to talk about such feelings and behaviors with others. These findings underscore the importance of early screening, plus education for individuals, families, peers, and communities around NSSI (and self-inflicted violence, more generally), to prevent and alleviate suffering.

In another qualitative example, from the Multimodal Treatment Study of Children with ADHD (Weisner et al., 2018), Lasky et al. (2016) demonstrated the importance of ecological “fit” between adults with ADHD and their occupational environments for perceiving ADHD symptoms as a strength vs. a liability. Additional findings from this study highlight the importance of context, role models, and self-perceptions regarding the initiation of, persistence in, and desistance from substance abuse among individuals with ADHD (Jensen et al., 2018; Mitchell et al., 2018; Swanson et al., 2018).

We close this section with the words of a BGALS participant, whose comments about ADHD, depression, and self-inflicted violence are utterly telling:

As a person that struggles [with ADHD and depression], it gets overwhelming. It takes over your life. It's an incredibly real thing. And I don't think that our society equips you — equips any adult — for how real it is. We don't talk about it. It's very glossed over in media. I mean, like you see depressed people in movies and whatever. And they're all ready to kill themselves or leap off a building or are drug addicts or are totally non-functional. The reality of it is the types of anxiety and depression that exist, more often than not, are really functional. They're people that are total go-getters. They're people that are, you know, honors students — everything. They put this insane amount of pressure on themselves and then snap and totally lose it. And it's really unfortunate. Because we are not taught self-care . . .

. . . So that's my view . . . that it needs to be, like if you even suspect that someone that you know is struggling . . . talk to them. Help them. Let them know that there are resources out there for them . . . Because it's so invalidating by our society. Just the way that we function, it's so stigmatized. And people that get caught into it feel so alone. It's a very, like, holding hands one step at a time. Just get through the next hour . . . until you can find the help that's going to work for you . . . Because it really did — it got to a point in my life where it really did almost end. I totally did not picture a life past like 20. Was not prepared, was not expecting, was almost not willing at certain points to live past that point in my life. Had a suicide attempt in my first year of high school, was a habitual self-harmer . . . I did all that kind of stuff. And I'm incredibly thankful that all those things failed. But it just, it is a really real issue and it's really not looked at and really not talked about in the way that it should be.

Reducing the stigma toward mental and neurodevelopmental conditions

The continuing stigmatization of, and discrimination against, individuals and families contending with neurodevelopmental and

mental health conditions, including substance use, is nothing short of staggering (Martinez & Hinshaw, 2016). Stigma is a term of ancient Greek origin, originally signifying the actual “brands” burned into the skin of members of devalued outgroups but now typically conveying a psychological process of differentiation involving stereotypes, prejudice, and discrimination (see Hinshaw, 2007; for the seminal account of stigma, see Goffman, 1963). Across societies and cultures throughout history, a number of social groups receive high levels of stigmatization for failing to “live up” to standards of health, behavior, appearance, or morals. In current times, stigma directed toward those experiencing mental disorders, substance use, and neurodevelopmental conditions remains particularly strong. All known cultures display such stigma toward the major forms of mental disorders, albeit expressed in different ways. As well, culture-specific stigmas exist with respect to specific forms of behavioral deviance. Overall, it is mistaken to conceptualize that mental-illness stigma exists solely in individualist (vs. collectivist) cultures – its universality is a tragic fact (Hinshaw, 2007).

Stigmatization includes the following: (a) public stigma – the attitudes and practices of mainstream society in relation toward those in outgroups; (b) internalized (or self-) stigma on the part of those experiencing stigma, including negative self-perceptions that often prevent treatment seeking (Livingston & Boyd, 2011; Sirey et al., 2001); (c) “courtesy” (or associated) stigma (Goffman, 1963), signifying the extension of negative attitudes and discriminatory practices toward people affiliated with stigmatized individuals – especially family members and treatment providers; and (d) structural stigma, conveyed via laws, policies, and practices targeting minoritized and discredited groups (see Hatzenbuehler, 2016, for an essential overview; see also Hatzenbuehler et al., 2024, and Pachankis et al., 2021, for updated reviews). Note that stigmatizing attitudes, both public and internalized, may also be held implicitly (Rusch et al., 2010). The consequences of stigmatization and discrimination range from micro-aggressions – and “covering” on the part of the devalued individual – to social exclusion, dehumanization, and even extermination (Hinshaw, 2007). Regarding mental and neurodevelopmental disorder as well as substance use, stigma magnifies and transforms the impairments emanating from relevant symptoms, too often resulting in lives of despair and hopelessness (Hinshaw, 2017a, 2023). For heuristic accounts of the multiple, interacting components of stigmatization, see Link and Phelan (2001) and Pescosolido et al. (2008). Our aim in this brief section is to encapsulate how DP percepts and principles may apply to stigma and discrimination—and means of reducing both.

Continuum perspectives

As articulated by Haslam (2000; see also Haslam & Ernst, 2002), when groups are deemed categorically and essentially different from the mainstream – i.e., fixed, discrete, invariant through history, and fundamentally distinct from fellow humans – levels of stigma and discrimination are likely to be magnified. Such “essentialist” lay theories of difference are a trigger for dehumanization, given the clear differentiation of outliers from the mainstream (Haslam & Loughnan, 2014). But what of the evidence-based contention, embraced by DP-related accounts, that nearly all forms of mental disorder are *not* distinct categories, instead representing quantitative differences from the norm? Could such a perspective promote the sense of a wider ingroup including more of humanity, reducing stigmatization?

Research across the past decade has examined this contention via experimental manipulations. Particularly regarding depression, Schomerus et al. (2013, 2022) and Buckwitz et al. (2022) showed that inducing perceptions of a fundamental continuity between depression and normative experiences of sadness can be associated with reductions in stigmatization. Parallel findings exist for schizophrenia (Thibodeau et al., 2018; Thibodeau, 2017; Violeau et al., 2020), although it is not fully known whether perceived similarity between oneself and an individual with a psychotic disorder will reduce social distance and other indicators of stigma.⁹ A closely related theme pertains to the modern understanding, discussed earlier, that risk for many forms of mental disorder is at least moderately – or strongly in the case of ADHD, autism spectrum disorders, schizophrenia, and bipolar disorder – heritable, with implications for the roles of brain architecture and neural pathways in relation to symptoms (Beauchaine & Hinshaw, 2017). Per attribution theory, the ascription of deviant behavior to an uncontrollable cause, such as a disease, should reduce blame and therefore lessen stigma.

Relevant empirical evidence severely challenges this perspective. Experimental manipulations aimed at promoting a biogenetic model of mental disorder (e.g., that it is a brain disease, linked to genes), as opposed to more psychosocial perspectives, *do* reduce blame. Yet the biogenetic ascription induces of hopelessness about the affected individual and promotes perceptions of dangerousness and violence. As well, the classic stigma indicator of social distance is *not* significantly improved via such biogenetic framing (see Kvaale et al., 2013; see also Pescosolido et al., 2010, for population level trends of continuing stigmatization despite growing acceptance of biogenetic models). In all, Haslam and Kvaale (2015) contend that biogenetic attributions for mental disorder incur “mixed blessings” regarding stigma reduction.

On the one hand, asserting that mental and substance use disorders, along with neurodevelopmental conditions, are the products of evil spirits or character flaws – prevalent throughout history – is both mistaken and utterly stigma-promoting (Hinshaw, 2007). On the other hand, an automatic presumption that severe behavioral deviance is always the sole product of flawed genes or a disordered brain is (a) inaccurate, given the relevant transactional and equifinal paths involved; and (b) may promote the essentialist perspective that people exhibiting such symptoms are fundamentally and biologically inferior to “normal” individuals. At the very level of their very DNA, such individuals may be perceived as not fully human. Even their parents, blamed throughout the 20th century for having caused offspring mental disorder through maladaptive parenting, are now responsible for having passed on pathological genes. Necessary is the perspective, which also applies to many forms of complex medical conditions, that whereas genes may potentiate risk and that neurobiological underpinnings of illness are undoubted, such factors as life experiences, environmental risk (including both toxic settings and

⁹Stigma measures usually comprise (a) knowledge of mental health conditions, (b) attitudes toward people displaying pertinent symptoms, (c) intended behavioral actions to reduce stigma (e.g., stopping someone who makes derogatory comments), and (d) scales of desired social distance from relevant individuals (either the general label of mental illness or a specific condition). Designed by Bogardus (1933) regarding racial prejudice, social distance items inquire about willingness to engage with individuals at large distances (e.g., living in the same city) all the way to more intimate contact (working together, going out with, letting one’s daughter marry, etc.). These have been consistently used in the U.S. National Stigma Study for many decades. It is important to note that enhancement of knowledge of symptoms and syndromes, although potentially valuable, does not in and of itself lead to improved attitudes or lowered social distance. In fact, education without social contact and humanization may well backfire.

psychological trauma), social context (including supportive environments), and the receipt of evidence-based interventions are all pivotal for outcome. Without perspectives emphasizing humanization, the reductionist disease model does not automatically reduce stigma and may in fact promote dehumanization.¹⁰

Transactional pathways and the potential for recovery

Defying stereotypes of permanence – “once mentally ill, always mentally ill” – is voluminous evidence that mental disorders are not ever-present and fixed but instead characterized by fluctuating features and/or episodes of worsening vs. improvement (see Sibley *et al.*, 2022, regarding long-term outcomes of ADHD). Despite lingering symptoms and impairments, as well as the potential for recurrence when stress is high, coping with and recovering from mental conditions is entirely possible (Hinshaw & Cicchetti, 2000). In DP, emphasis on reciprocal and transactional pathways, risk and protection, and the potential for resilience is paramount (Luthar *et al.*, 2000; Masten, 2019). An overview of the 35 volumes of *Development and Psychopathology*, along with other, wider literatures, makes clear that setting and context, realistic yet aspirational expectations, receipt of intervention, and personal effort plus social support are essential parts of the full picture. The view that mental disorder is an intractable flaw, impervious to intervention and representing a true “mark of shame” flies in the face of epidemiological data, lived experience, and a humanized perspective.

Although the most severe cognitive, mental, and substance-related problems show clear indications of the presence of disease states – so long as conceptions of disease are aligned with complex, multifactorial etiology – problematic are (a) the field’s ever-increasing reliance on exclusive medicalization/reductionism and (b) the resultant tendency to discount the social and cultural embeddedness of psychiatric issues. Even the less-stigmatizing language of the modern era (e.g., the use of *psychopathology* instead of *lunacy*; or *intellectual disability* instead of *feble-mindedness*) still conveys an intraindividual locus.

The neurodiversity movement of recent years provides an important counterpoint (see Doyle, 2020, for a heuristic introduction). The essential idea is that individuals with autism spectrum behaviors – the arena in which neurodiversity arose – are endowed with brains showing non-normative strengths and weaknesses, which may enable them to thrive in optimal environments. The same may pertain to spectra of attention-related, mood-relevant (e.g., the bipolar spectrum), and a number of other mental health and neurodevelopmental conditions. If so, we pose a fundamental question: Is the ultimate aim of our field to mold and shape conformity to narrow standards of behavior? Or instead to create contexts that enhance optimal lives for those with neurodivergent tendencies and styles?

At the severe end of relevant spectra, we believe that intervention is essential to promote adaptive functioning and even to save lives. In other words, we contend that unchecked mania/mixed episodes, terrifying post-trauma symptoms, or autistic features paired with intellectual disabilities (for example) do not inevitably represent hidden gifts – or that altering current contexts can somehow magically allow everyone to thrive. At the

same time, however, intervention should not be construed automatically as promoting adjustment to current “ableist” social contexts. Promotion of strengths, including adaptive school and work contexts, is crucial. Stepped-care models, in which low-intensity interventions are first utilized, only then “stepped up” when impairment is strong and distress/impairment is high, are a real consideration (Ho *et al.*, 2016). In addition, promotion of strengths, and provision of nontraditional settings to enhance optimal functioning, should be prioritized.

In short, the task is both providing access to evidence-based intervention for those in need while simultaneously widening the scope of acceptable behavior patterns – and promoting optimal adaptation for all, so long as the rights of others are not threatened. Along with the recovery movement, with its emphasis on more equitable power relationships between patient and doctor, and consideration of goals that transcend symptom reduction *per se* (Jacob, 2015), the neurodiversity perspective provides a needed jolt to the entire field to reconsider its overemphasis of reductionistic disease models – and to imagine that genetic and behavioral diversity is the hallmark of our species. Indeed, without sufficient diversity, any species will be threatened as ecologies change. In parallel, provision of effective treatments can be a game-changer for individuals, families, communities, and society at large.

Several decades ago, the most stigmatized illness on earth was undoubtedly HIV/AIDS. Yet the introduction of antiretroviral treatments, beginning in the early 1990s, not only prolonged lives but also served to squelch stigma and discrimination. See, for example, Wolfe *et al.* (2008), who revealed dramatic levels of stigma reduction in an experimental manipulation where access to evidence-based intervention was the independent variable. In all, the answer is multifaceted: Assurance of evidence-based care for those in the clinical range, access to prevention and coping strategies for those at risk, reduction of needless models of perfectionism in current culture (especially for young people), and recognition of the value of considering wider ranges of behavioral diversity across the population.

Multilevel solutions for a multifaceted phenomenon

Stigmatizing attitudes and discriminatory behaviors are not the province of a subpopulation of “bigots” (Hinshaw, 2007). Instead, perspectives from evolutionary and social psychology emphasize that underlying components of stigma, such as stereotyping, are normative. This is not surprising for humans, who continually balance the major need for social connectedness with a naturally selected proclivity to be wary of complete acceptance of all fellow humans (Kurzban & Leary, 2001). Avoidance of those who are potentially contagious, exclusion of “cheaters,” and wariness of and aggression toward those with highly different social mores and appearance are part of our legacy. Still, there is no inevitable determinism in this argument: Our abilities to reason in response to “automatic” exclusionary triggers – and to cognitively empathize – are major antidotes. Given the sheer prevalence of mental and neurodevelopmental conditions, along with the strong proclivity to alter consciousness through ingestion of substances, the consequences of continued stigma and discrimination are self-defeating, with respect to reduced social harmony, depleted social capital, lowered economic productivity, and sheer lack of acceptance. We all lose if exclusion, punishment, and dehumanization persist.

Spanning half a century, U.S. national-level surveys reveal the juxtaposition of (a) greatly increased public knowledge of mental

¹⁰For important work on the extremely high levels of stigma directed toward individuals with substance use disorders, often termed “addiction” in relevant literature, see Barry *et al.* (2014). More recently, Krendl and Perry (2023) presented a major review of such stigma (see commentaries by Hinshaw, 2023, and Sher, 2023). A neuroscientific perspective on substance use disorder and addiction is espoused by Adams and Volkow (2020).

disorders with (b) either no change in – or worsening of – stigmatizing attitudes. Clearly, sheer knowledge of symptoms or understanding of biogenetic causal factors is not sufficient to change attitudes and/or behaviors (Pescosolido et al., 2010). In a recent “first” – via the latest rounds of the National Stigma Study – Pescosolido et al., (2021) revealed signs of real hope. From 2008 to 2018 an unprecedented and substantial decrease in stigma toward people with depression was found. Still, across different vignettes in the same survey, evidence revealed that stigma toward psychosis (schizophrenia) and substance use (addiction) actually had increased over that same time period. In short, the road ahead is long.

A key question pertains to the locus of stigma-reduction: At what level(s) should efforts be pursued? This crucial question recalls the previous discussion of multiple levels of analysis. Taking the important example of climate change, higher-level policies related to carbon taxing and electric vehicle mandates must be paired with individual-level actions linked to recycling and eco-friendly behaviors, if lasting change is to occur. In the same vein, only multi-level efforts will ensure lasting change regarding stigma and discrimination.

(1) *Systems-level*: Over past decades, federal law has made it illegal to discriminate against people with physical or mental disabilities via the Americans with Disabilities Act [ADA]. In the realm of insurance coverage for treatments related to mental disorders, the Wellstone Act has, at least on paper, addressed the issue of “parity” (i.e., same levels of coverage must be offered for mental and physical conditions). Still, enforcement is quite uneven. Even more, states differ widely in terms of protections for potentially vulnerable groups – such as those with diverse sexual orientations. As increasingly demonstrated (see the pioneering work of Hatzenbuehler et al., 2024), in states lacking such protections, physical, behavioral and emotional health of vulnerable populations is significantly worse than in states affording key protections (as is response to evidence-based treatment). Still, as made clear in areas such as civil rights legislation, legal mandates alone cannot assure that individual prejudice, bias, and stigma are eliminated. Systems-level antidiscrimination mandates are necessary but not sufficient to eradicate stigma and prejudice.

(2) *Public media*: Another level pertains to media portrayals. Despite major efforts in the arena of conveying authentic personal accounts of coping and recovery, predominant media perspectives on mental disorder and substance use/addiction are replete with portrayals of incompetence and/or violence. School shooters, unhoused (homeless) individuals, and accounts of unruly behavior predominate, perpetuating biased information about overall rates of violence (as opposed to the far higher rates of violence victimization) among people with mental disorders (Thornicroft, 2020). Such is also the case with respect to depictions of serious mental illness in popular video games, which attract huge audiences among younger people (Buday et al., 2022). At the same time, even progressive media coverage may, these days, emphasize a reductionistic neurobiological, biogenetic perspective. In terms of social media, the Surgeon General’s Advisory (Department of Health and Human Services, 2023) related to social media and youth mental health provides an important examination of both positive and decidedly negative mental-health outcomes linked to (excessive) use of social media. Despite major controversy regarding the overselling effect of social media on brain development and mental health (see Odgers, 2024), there are strong signs that girls and young women who excessively use social media for social comparisons are at especially high risk for negative consequences (Twenge et al., 2022).

(3) *Community: Contact hypothesis*. For decades, the predominant perspective on the optimal means of overcoming prejudice and stigma has focused on *social contact* between members of ingroups and outgroups (Allport, 1954; Pettigrew & Tropp, 2006). Subsequent elaborations reveal that benefits are enhanced when such contact occurs (a) among individuals of relatively equal status/social standing, (b) with the presence of common/superordinate goals, and (c) in the contexts of institutional supports for equitable contact. Forced or unequal contact may breed further prejudice, stigma, and hatred; but the overall consensus is that contact under optimal conditions is more powerful than is education per se in mitigating stigma (e.g., Maunder & White, 2019; Thornicroft et al., 2016). Of course, ensuring that contact occurs equitably necessitates policy-level supports.

(4) *Individual level*: Members of society can combat stigma in informal, local contexts via empathy and social action. Additionally, a major means of reducing internalized/self-stigma for members of minoritized groups comes through identification with fellow outgroup members, subsequent solidarity, and ensuing social action. Sharing of lived experience via narrative/first-person accounts is also a key means of opening minds and enhancing acceptance (see Bush, 2024, for an example of the power of lived experience in shaping research and policy surrounding the topic of prenatal maternal stress and its effects on offspring). In the arena of mental disorder, the plethora of first-person accounts of personal and family experiences of mental disorder (e.g., Hinshaw, 2017a; Jamison, 1996; Saks, 2008), along with more recent research on lived experience of students, trainees, and professionals in mental-health fields (Victor et al., 2022), is illuminating.

In this capsule review of different “levels” of stigma reduction, we have come full circle, given that (a) accumulations of individual-level actions can precipitate more general social change and (b) supportive contexts and policies pave the way for individual and family thriving.

Essential to the DP perspective, transactional models and processes are on full display.

Conclusion

Our strong contention is that the transactional, dynamic, multi-systemic tenets of DP are essential for both (a) understanding the nature of developmental deviations that predict problematic emotional, cognitive, and behavioral functioning and (b) reducing the still-persistent stigma toward and discrimination against individuals and families experiencing mental health and neurodevelopmental conditions, including substance use disorders. Given the length of our arguments above, a brief summation must suffice.

First and foremost, reductionistic, “either/or” models of genetic/biological risk vs. socialization/trauma-related pathways are doomed to fail in explaining the utterly complex subject matter of behavioral, emotional, and cognitive deviations from the norm. The nature of the world, and of the development of psychopathology and resilience, far transcends the simplistic, unidirectional accounts pervading too much of the past century. Given the rising tide of serious mental health problems in the current era, exacerbated by the COVID-19 pandemic but predating and extending beyond it, we can ill afford models that fail to account for the transactional nature of the subject matter at hand. Only through multi-level, transactional accounts – at the levels of genetic vulnerability; a host of environmental risks spanning prenatal and postnatal development; contextual forces within families, schools,

neighborhoods, and communities; and key processes of income inequality, structural discrimination, and intersectionality (see Acker *et al.*, 2023; Kern *et al.*, 2020) – can we envision real hope of moving the needle in significant ways. As emphasized by Beauchaine (2024), it is most welcome to witness recent integrative accounts of social and structural “drivers” of health and mental health into the psychopathology arena, which has long adhered to narrowly based medical and intraindividual models.

Second, the integration of insights from both clinical samples and larger population-level sampling methods is required, via deployment of advanced quantitative approaches that can integrate nomothetic and idiographic perspectives. The latter should include strategies such as ecological momentary assessment and other means of capturing the wider variations within individual-level as opposed to group-level accounts of key behaviors and processes (e.g., Fisher *et al.*, 2018). And, as noted in the section on qualitative perspectives, a mixed-method approach of integrating the lived experience of individuals with mental and neurodevelopmental conditions with quantitative data on individual- and group-level trends can further humanize research programs while keeping them relevant to phenomenological experience.

Third, although it would take an additional review article to highlight trends in intervention research, we emphasize that treatments and preventive strategies aimed at promoting recovery, via facilitation of protective factors/strengths, lie at the core of both DP and anti-stigma efforts. The ongoing mental-health crisis in teens and young adults provides a sobering counterpoint to the gains of the DP enterprise over the past half century. In short, reflecting the confluence of multiple influences (e.g., societal, cultural, familial), it offers a renewed challenge to the notion that reliance on individual levels of treatment involving symptom reduction as the main goal can ever hope to be adequate for the task of alleviating the huge burden linked with mental and neurodevelopmental disorders.

Finally, the call for integrated models resonates strongly with our plea for multi-level approaches to reducing stigma and discrimination. As emphasized, efforts at the levels of antidiscrimination policies, enlightened and humanized media accounts and portrayals, equitable contact, and the kinds of knowledge enhancement that emphasize the potential for recovery and hope – rather than chronicity and despair – are all essential. In the end, we must accentuate the humanity of each member of our species as we try to reduce, even eliminate, the often-tragic consequences of mental, substance-related, and neurodevelopmental differences and conditions. For those entering the field as investigators, clinicians, and policy-makers, we believe that the essential challenge lies at the crossroads of expanded access to evidence-based treatments, the embracing of diversity, and the promotion of humanization.

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