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Borrowing Bronfenbrenner: an Argument for Increasing the Intersection of Diverse Theoretical and Applied Models

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Abstract

We have observed that as the theoretical landscape in behavioral science continues to proliferate and diversify, it is not uncommon that distance between subspecialties emerge, artificially accentuating differences between camps. This may occur at the risk of losing sight of the common ground, and worsening communication between subspecialties. In this paper we propose conceptual "crosswalking" as a means to preserve interdisciplinary communication within the behavioral sciences. This is illustrated using Bronfenbrenner's Person-Process-Context-Time (PPCT) Model, mapped onto therapeutic modalities with a focus on ecological systems. Recommendations for future crosswalking are made.

Borrowing Bronfenbrenner: An Argument for Increasing the Intersection of Diverse Theoretical and Applied Models

In healthcare there is a growing movement to establish more effective systems of integrated care to improve communication between specialties, coordinate efforts, achieve more complete diagnostic pictures, and ultimately improve the quality of service delivery (Strosahl & Robinson, 2018). In this way we have physicians practicing internal medicine working more closely with psychiatrists and other specialists. Psychologists and social workers are also being integrated into the treatment team for the value their specialties can provide beyond their obvious overlap with psychiatrists (Project LAUNCH issue brief, November 2017). Interdisciplinary efforts are just as relevant in the theoretical and research realm. What can we learn from better integrating research in the areas of psychopathology, human development, and psychotherapeutic interventions? Each specialty contains natural overlap with the others. However, more common than simultaneously benefiting from and enlightening each other, efforts tend to focus on more precisely articulating and measuring distinctions.

It can be difficult for clinical professionals to directly apply insights from research literature. Furthermore, when clinical interventions are studied, the theoretical underpinnings are referenced and briefly summarized while the focus of the research is a competitive comparison between the target intervention and common practices. There exists not only an opportunity, but a need to integrate and coordinate the efforts and insights from diverse studies of human development, functioning, and treatment. Meeting this need through theoretical “crosswalks”, as we will define them, will allow behavioral sciences to join the efforts of integrated health and better meet the growing mental health needs of our communities.

Our effort, in this paper, is to illustrate a theoretical crosswalk and why this mental exercise may be helpful in communicating shared goals in advancing behavioral science and practice. We define a theoretical crosswalk as a mental exercise in which shared aspects of theories and/or practices are brought to light with the express purpose of enlightening shared understanding. The idea of applying theory to practice is not new; in fact, crosswalks and linkages between social psychological theory and clinical psychology, for example, sit at the foundation of current clinical practice (Klein, Rothman, & Cameron, 2013). It is also not new to attempt to integrate different theories into meta-theories (e.g., Datan, 1977; Witherington, 2007; Wozniak, 2014; Bortz, Berrigan, VanBergen, & Gavazzi, 2019). Nonetheless, to date we have yet to find articles that elucidate linkages (either intended or happenstance) between theory and practice with the specific purpose of publicly acknowledging cross-cutting similarities as means to greater interdisciplinary communication.

To exemplify this process, we have chosen a broadly-focused developmental model—Urie Bronfenbrenner's (1979) Person-Process-Context-Time (PPCT) model--that accounts for both proximal and distal factors on human development. Bronfenbrenner's developmental model will be shown to parallel and overlap with various systems-based mental health interventions. In this case, we believe better understanding the linkage between PPCT and the clinical modalities below may strengthen clinical case conceptualization, and improve treatment efficacy when aspects of the PPCT are acknowledged as present in the service delivery. For developmental scientists, more readily acknowledging commonalities in undergirding theory which guides their work and the work of developmental therapists may serve to provide more robust context to academic activities.

The PPCT Model in Brief

Bronfenbrenner, like many others, believed in an interaction between the person and the environment which leads to subsequent development, which he qualified first by using two basic propositions:

> *Proposition 1*. Human development takes place through processes of progressively more complex reciprocal interaction between an active, biopsychological human organism and the persons, objects, and symbols in its immediate environment. To be effective, the interaction must occur on a regular basis over extended periods of time. These enduring forms of interaction are called *proximal processes*.
>
> *Proposition 2*. The form, power, content, and direction of the proximal processes affecting development vary systematically as a joint function of the characteristics of the developing person; of the environment—both immediate and remote—in which the processes are taking place; and the nature of the developmental outcomes under consideration. (Bronfenbrenner, 1994, p. 38)

Building upon these two propositions, Bronfenbrenner developed what he called an ecological systems theory (Bronfenbrenner, 1979). Like many viable theories, Bronfenbrenner's ideas about change and development evolved over decades of re-thinking and re-conceptualizing. His "mature" (Tudge, Mokrova, Hatfield, & Karnik, 2009) theory involved not just proximal processes, but the person, their environmental context, and a time component as well (Bronfenbrenner, 2005; Bronfenbrenner & Morris, 2006). The Process-Person-Context-Time Model (PPCT) has become the intended legacy of Bronfenbrenner's ideas, with the explicit intention of empirically testing the true effect that ecological systems have on the individual (Bronfrenbrenner, 1995). However, this to date has not been fully realized, with only a few

attempts (Tudge, Mokrova, Hatfield, & Karnik, 2009). That said, if one searches "Bronfenbrenner" on an EBSCO or Google Scholar search, many examples of attempts to apply his theories will be found, including topics like the effect of deinstitutionalization on families (Berry, 1995), understanding forces on youth in both urban and rural areas (e.g., Leonard, 2011, Ben-David, 2013), or using the PPCT as a framework for supervising counselors-in-training (Lau & Ing, 2018). Like many popular theories, his notions have resonated with many in both the academic and clinical worlds.

Understandably, then, the idea that individuals are influenced by and interact with their environments was not necessarily a novel idea at the time Bronfenbrenner began to develop his theory; however, possibly his ideas gave life to looking at systems in terms of human development, as well as in the development of psychopathology. Bronfenbrenner's model requires the passage of time, where over time the result of the person-process-context interaction can become maladaptive for the individual. Using proximal processes as a point of entry, one can also assume that processes can be influenced by different contextual systems; these systems then in turn interact and influence the individual, which could ultimately alter the quality of the processes themselves (Bronfenbrenner, 1995). Bronfenbrenner opted to illustrate this by demonstrating how different systems tend to nest within each other. His organizational arrangement is as follows: the microsystem (first-person interactions; e.g., family, school, friends), the mesosystem (interactions among first-person factors; that is, the quality of interaction between multiple factors from the microsystem), the exosystem (factors influencing the mesosystem such as neighbors, mass media, local politics, industry, and social services), and the macrosystem (context encompassing any group, such as cultural attitudes or ideologies). Different person characteristics pre-dispose which proximal processes are salient (e.g., a baby

smiling at mother and not at a stranger, as the mother is more proximal to the child's development), which then in turn interact with the individual's context, and are solidified over time (Bronfenbrenner, 1995; Tudge et al. 2009).

Clinical Applications

Though Bronfenbrenner did not tend to speculate over contextual influences on the development of individual psychopathology, we can assume that the synergy created by multiple process-person-context interactions over time could solidify maladaptive characteristics in the individual. This line of thinking can be seen across modes of thought in clinical psychology, including relational, cognitive/schema, and behavioral paradigms (Martin, 1987; Sarason, Sarason, & Shearin, 1986; Van Orden, Wingate, Gordon, & Joiner, 2005; Young & Lindemann, 1992). In like manner, the treatment of psychopathology from an ecological perspective has been shown effective (Bettmann, Gillis, Speelman, Parry, & Case, 2016; Burlingame, Fuhriman, & Mosier, 2003; Reese, Toland, Slone, & Norsworthy, 2010; Van der Stouwe, Asscher, Stams, Deković, & van der Laan, 2014.). Herein we will discuss three therapeutic modalities-- Multisystemic therapy (MST; see Figure 1), Outdoor Behavioral Health (OBH; see Figure 2), and Pediatric Integrated Primary Care (PCBH; see figure 3)-- with the intent of illustrating how they firmly sit on the shoulders of ecological systems theorists such as Urie Bronfenbrenner. We will discuss overarching connections between the theory and each modality, as well as comparing aspects of the modalities to specific components of Bronfenrenner's PPCT theory. As a part of this thought exercise, in-depth treatment will be given once to each PPCT component across the three modalities, while additional ideas for crosswalking the remaining components are given in the attached figures for each modality. Suggestions for further conversation and integration will also be provided.

Multi-Systemic Therapy (MST)

For many years, practitioners struggled to identify a therapy alternative that was both successful and cost-effective at treating serious disorders whose common pathway usually resulted in incarceration or psychiatric hospitalization. Multisystemic therapy (MST) uses theoretical underpinnings from social-ecological (Bronfenbrenner, 1979) and family systems (Minuchin, 1974) models of human behavior. The individual and their behavior are a combination of many different factors, contributing to development as a "reciprocal interchange between individual and nested concentric structures that mutually influence one another" (Lipsey, 1988). Multisystemic therapy was created to target individuals with serious mental health issues, such as antisocial personality disorder, and their ecological and family systems, while hopefully avoiding prison time or long-term behavioral facility treatment. Key principles in this treatment approach involve accurate assessment to determine the relation between identified problems and their "broader systemic context," promotion of positive responsible behavior and decrease in harmful behavior among family members, a focus on sequences of behaviors within or between multiple systems that maintain identified problems, and intervention that involves regular effort on the part of family members and support systems. Interventions should also be designed to promote treatment generalization and long-term maintenance of therapeutic change by empowering care-givers to address family members' needs across multiple systemic contexts (Henggeler, 1999).

Multisystemic Therapy (MST) has been shown to be effective at treating criminal, delinquent, and anti-social behavior through robust, evidence-based research. Multiple studies starting in the mid 1980's and continuing through today suggest that this systems and social-ecologically focused intervention lowers risk of re-arrest with serious juvenile offenders and

adolescent sexual offenders, as well as improved family relations and parent-child relationships (Henggeler et al., 1986; Brunk, Henggeler, & Whelan, 1987; Borduin, Henggeler, Blaske, & Stein, 1990). In one study, 200 juvenile offenders and their parents or care-givers were given the option to receive MST or individual therapy (IT; Borduin et al., 1995). The participants were extensively involved in criminal activity, evidenced by their average of 4.2 previous lifetime arrests, and 63% having previously been incarcerated. Upon 4-year follow-up, 22.1 of MST completers had be re-arrested, compared to 46.1% of MST dropouts, 71.4% of IT completers, 71.4% of IT dropouts, and 87.5% of treatment refusers (Borduin et al., 1995). This study, along with others since, have demonstrated that MST is an effective treatment for serious juvenile offenders.

MST and the Microsystem. As a systemically-oriented therapeutic modality, it is not hard to see that MST agrees with many aspects of the PPCT; in fact, it is clearly understood by experts that MST borrows to an extent from Bronfenbrenner (Huey, Henggeler, Brondino, & Pickerel, 2000; Edwards, Schoenwald, Henggeler, & Strother, 2001; Curtis, Ronan, & Broduin, 2004; Van der Stouwe, Asscher, Stams, Dekovic, & van der Laan, 2014). This connection has been explicitly stated in the literature, and is evident across Bronfenbrenner's concentric systems; however, perhaps the most influential application of theory to MST practice is the change exerted on the child's *microsystem*, consisting of the home, school, peers, and other environments involving first-person interaction. This is because, as has been seen, for the target population (adjudicated children and teens) individual counseling may be insufficient to change behavior (Borduin et al, 1995). In these cases, support systems like parents, caregivers, other family, schools, and health systems are needed to bolster change efforts. The intended outcome is to mold the child's microsystem to reinforce prosocial behaviors at every turn. Tacitly

assumed is that at some point the child's structure of interactions with their microsystem became disordered, continuously promoting antisocial and maladaptive behavior. For example, a successful MST effectiveness study for juvenile sexual offenders was delivered by therapists in the home and at school, arguably the two locations of greatest environmental influence (Letourneau et al., 2009). A compelling inclusion of the MST condition compared to treatment-as-usual was incremental help to the families of the adolescent client in identifying positive, prosocial peers and then assisting in preparing the home to be a more attractive social gathering location.

While one may immediately assume the family system to be mainly to blame for misbehavior, MST and Bronfenbrenner both consider the sum of the person-process-context interactions as contributors to maladaptation. Cementing positive change through MST is a labor-intensive process (typically 60-100 direct contact hours with a therapist over 3-6 months), and patience and commitment to gradual, small changes is encouraged. In like manner, Bronfenbrenner posited that the person develops over time, given the complexity of person-environment interactions. Understanding this may help MST clinicians to contextualize the yeoman's task of altering the individual's pattern of interacting with their respective environments, as well as the pattern of environmental responses.

Outdoor Behavioral Health (OBH)

Outdoor Behavioral Health (OBH), often synonymously referred to as Adventure Therapy or Wilderness Therapy, is a distinct, evidence-based psychotherapy placing strong emphasis on the therapeutic effects derived from the specific context of the outdoors. While there is some debate over the precise definition of OBH, it has been described elsewhere as "the

prescriptive use of adventure experiences provided by mental health professionals, often conducted in natural settings that kinesthetically engage clients on cognitive, affective, and behavioral levels" (Gass, Gillis, & Russell, 2012). Outdoor Behavioral Health is designed to assess and treat adolescent clients with a variety of mental health concerns in an extended stay (inpatient) outdoor setting. It has been shown effective for various presenting issues, including juvenile delinquency/conduct disorder (Jones, Lowe, & Risler, 2004), avoidant personality disorder (Eikenæs, Gude, & Hoffart, 2006), depression (Norton, 2008), general distress (Demille et al., 2018; Roberts, Stroud, Hoag, & Massey, 2017) and sexual misconduct (Somervell & Lambie, 2009). There is also some evidence to suggest cost-benefit of OBH when compared to treatment-as-usual (Gass et al., 2019) A 2016 meta-analysis also demonstrated medium effect sizes for OBH on self-esteem ($g = 0.49$), locus of control ($g = 0.55$), interpersonal effectiveness ($g = 0.46$) and clinical symptoms ($g = 0.50$; Bettman, Gillis, Speelman, Parry, & Case, 2016). There is also evidence for improved family communication after program completion (Liermann & Norton, 2016). Exploring and thriving in the wilderness is novel for most who attend OBH. The introduction of the child to this context, even if limited in duration, provides distinct environment and structure intended to facilitate change. Taylor, Segal, and Harper (2010) argue that the change in context incites a state of disequilibrium as clients are still accustomed to their everyday urban lifestyle. This state of imbalance causes the need to shift internal states to adapt and rely on others. Over time, a reorganization process occurs, leading to a self-systemic change in relation to the context. To maintain change, a period is allotted for debriefing and continued therapy after returning from the wilderness, but before full reintroduction into the old context. The post-wilderness element is suggested to prevent old habits and styles of relating to the normally lived context that may retake hold if reintroduction is too sudden.

The Mesosystem and Exosystem Applied to OBH. Given that OBH often takes place outside the child's normal context, it is important to consider crosswalking this modality with multiple systems in the PPCT model. For the purposes of this paper, we have chosen to elucidate OBH with both Bronfenbrenner's Mesosystem and Exosystem. If, for example, the child is removed from their home and taken to a wilderness location to receive counseling, the child then no longer resides in their normal person-process-context; their nascent concentric contexts lie dormant while they are exposed to new contexts. Normally, the child's exosystem would consist of people and their products just outside the child's immediate reach, such as neighbors, mass media, industry, local politics, and social services (Bronfenbrenner, 1979). In a wilderness setting, the child is exposed to many fewer such human products, requiring them to interact more intuitively with their natural environs. For example, "neighbors" may consist of trees, brushland, animals, and possibly the occasional outdoors enthusiast not associated with the wilderness program. The child is removed from the "noise" associated with their nascent exosystem (i.e., home environment) that likely contributed to or reinforced the maladaptive behavior, and given the chance to develop new, healthy patterns of interacting when they return home.

These new skills learned are only effective, however, if the child can apply them to the old context from which they came. The intent, in fact, in all OBH programs is for the child to make these applications. For every child, there will come a point at which they make initial contact with each of their previous systems and interaction patterns, but those who are successful are those who intentionally decide to interact differently. Essential to the child and their nascent microsystem is an awareness of the *mesosytem*; that is, the interactions between these first-person factors. While on a therapeutic excursion, the child's microsystem (e.g., therapist, psychologist, peers) worked intentionally and consistently to bolster the child's recovery.

However, this consistency is usually challenged when the child returns to their old environment (Leichtman & Leichtman, 2001; Nickerson, Salamone, Brooks, & Colby, 2004). As mentioned, therapeutic wraparound services may be used to address this challenge. Thereby the child's newly acquired therapeutic microsystem may communicate with the nascent, receiving microsystem, and just as the child was scaffolded in their outdoor experience, so too may their family be scaffolded for a short period.

Pediatric Primary Care Behavioral Health (PCBH)

Behavioral specialty integration into primary care and pediatric settings allows for surveillance, prevention and treatment of mental health and behavioral problems in children. This is a growing trend in part because it is more convenient to U.S. families as most youth have access to primary care practitioners (Asarnow et al., 2015) and because it may be cost effective (Gouge, Polaha, Rogers, & Harden, 2016). Behavioral health specialists also have more access to assist youth and families with reduced need for delayed specialty referral and additional health delivery locations. In addition, there is a clear benefit in behavioral health specialists, primary care providers, and other health professionals collaborating to treat mental health concerns, with significant evidence especially in adult populations (Woltmann etal., 2012). Integration can come in the form of in-vivo or telehealth counseling or consultation within the primary care setting in support of interdisciplinary efforts. In cases where the mental health professional is present within the Primary Care Clinic, care may be provided in a nearby office to the youth patient with the option of including guardians or other family members. There are also models in which the mental health professional joins the pediatrician or other medical provider and shared delivery of care is afforded to the patient.

Interventions by behavioral health practitioners are often brief and behaviorally focused, often capitalizing on a biopsychosocial conceptualization of the patients and their problems (Kazac, 2006). A biopsychosocial framework includes understanding the child or adolescent not only from a physical and psychological perspective, but also assessing how these domains interact with the individual's physical environments (home, school, medical setting, etc.) and relationships (parents, siblings, peers, teachers, etc.). Growing evidence of the benefit in pediatric populations of this model include meta-analytic results of 31 RCTs (Asarnow et al., 2015) indicating that integrated behavioral health interventions could render a better outcome than usual care for children and adolescents ($d = 0.42$) with a variety of mood, anxiety, or behavioral symptom presentations. Further, effect sizes were largest in collaborative care models in which the mental health professional, care manager, and primary care practitioner all worked as a team to treat the youth ($d = 0.63$).

Pediatric PCBH and the Macrosystem. While Pediatric Primary Care Behavioral Health might be applied to each of the facets of Bronfenbrenner's theory (Figure 3), we chose to focus on its inherent and important applicability to the Macrosystem, or the attitudes, beliefs, and ideologies of the culture at-large. It is widely understood that mental illness/mental health has suffered from a public stigma problem virtually since the inception of the discipline (Corrigan, 2004; Fink & Tasman 1992). This stigma also migrated to the family, where parents often display exaggerated perceptions of their child's behavior (Johnston & Freeman, 1997; Johnston & Patenaude, 1994). For example (and fitting to the scope of this paper), it is not uncommon to believe that a child's misbehavior is the result of poor schooling, poor parenting, or a "chemical imbalance" warranting medication. Less common is a belief that a child's behavior is a result of complex interactions between mind, body, and their environment, as illustrated here. Such a

macrosystem can have a deleterious downstream effect on the child's development of psychopathology, and on their patterns of interacting with more proximal systems.

With that said, the trend toward integrating behavioral health services with pediatric clinics lends to the possibility that the Macrosystem (i.e., attitudes and beliefs) may shift toward reinforcing healthier individual and collective behavior. This might occur in a few ways, including 1) leveraging existing bias toward medicine to improve "branding," 2) promoting mental health as preventive care, and 3) increasing overall exposure to behavioral health concepts. Integration over time can help children and parents to see a visit to a mental health professional as another trip to "the doctor," with co-location of services potentially providing greater opportunity for access and demystification of mental health services. This can be aided by medical professionals, whose position in the medical system as trusted experts can help parents and children treat mental health services as "standard practice." Putting mental health services at the forefront in this way may also be a boon for more vulnerable populations such as the underserved, youth in developmental transitions, and those with complex or chronic medical conditions (Benuto & O-Donohue, 2016; Freeman, Hudgins, & Hornberger, 2018; Kathol, deGruy, & Rollman, 2014; O'Loughlin, Donovan, Radcliff, Ryan, & Rybarczyk, 2019).

A Note about Complex Reciprocal Interaction and the Chronosystem

Perhaps just as important as the individual facets of Bronfenbrenner's PPCT is the complex reciprocal interaction that occurs between the child and each of their outlying systems. Each child is comprised, to varying degrees, of interactions which ultimately make up their temperament and personality. So far, we have noted that maladaptation in any single system can have a detrimental effect on the child, but this is realized through the complex reciprocal

interactions between systems. Multisystemic Therapy, Outdoor Behavioral Health, and Pediatric Primary Care each take aim at these interactions. Clinicians recognize that a child is not simply misbehaving because of temperament or dysfunctional thought, but also many other observable and unobservable factors are at play, including the complex microcosm of reciprocal interaction between the child and their environment. Bronfenbrenner posited that the more encouraging and nurturing these relationships and places are, the more adaptively the child will develop. In OBH, for example, the extended therapeutic milieu including adventure elements, individual and group therapy sessions allow for multiple facets of the client's problems to be addressed and in a variety of ways. In MST, the hope is that intervening with parents and others close to the child will aid in buffering against recidivism toward previously-held patterns of reciprocal interaction with various systems. The same is true in Pediatric Primary Care, with an added eye toward the child's medical stakeholders also being invested in positive change in interaction patterns.

Mention should also be made of the final of Bronfenbrenner's nested systems: the chronosystem. As noted, the passage of time is essential to development under the PPCT Model. As applied to our three therapeutic modalities, the chronosystem is vital to understanding and enacting therapeutic change. It is over time that the child learns to interact maladaptively with their various concentric systems, and it is over time that these patterns are exposed, treated, and molded into adaptive patterns. The chronosystem is also employed as clinicians learn more about the children and families they are treating, develop therapeutic rapport, and make tests of change on the malleability of the child's interaction patterns. Therefore, it is often important to pace and/or repeat the delivery of mental health interventions, reevaluate the impact of complex reciprocal interactions, and maintain background and case conceptualization documents that are periodically updated.

Conclusion and a Call for Crosswalking

Bronfenbrenner's PPCT model of development provides a useful heuristic for understanding the influences that impact how an individual may develop or change across the lifespan. These ideas can and have been applied, as well, to a different type of span—the psychotherapy room—and are observable in therapy that targets more than just the individual. While this thought experiment includes a great deal of conjecture, we encourage psychologists in both clinical and developmental realms to be open to making similar connections between schools of thought. Doing so may allow for greater clarity and agreement, greater collaboration, and more effective communication. Our hope is that when developmentalists come into casual contact with concepts related to systemically-oriented psychotherapy, that they treat these modalities as a meaningful application with many common core beliefs in agreement with theories of child development such as the PPCT; in like manner, our hope is that when clinicians learn about PPCT and other systemic theories that they treat the theory as a specific, intentional, and essential foundation for the work they perform with clients. Other specific recommendations for practitioners include:

- Use the PPCT Model to assess the greatest influences on the client in terms of sustained behavior change. This may invite more targeted questions around the microsystem.; for example, rather than simply asking if a client has adequate social support, asking about the quality of their microsystemic interactions, including whether there exists agreement on treatment goals.

- Clinicians can engage a client's mesosystem by acknowledging the multitude of reciprocal interactions at play among the client's microsystem; this could involve discussions with various entities in the microsystem (family, friends, school, church, etc.)

to highlight how each has a part to play in the child's positive development, and the impact of communication between these entities whether explicit or implicit.

- Organizations may target an aspect of the exosystem/community that is shared among many of their clients – a school, neighborhood, church, etc.--and conduct outreach interventions with stakeholders and/or the public through a partnership with that entity.

- The macrosystem may be of importance to the clinician in their work with client values and stigma. The clinician should ask about values, note how these may differ from systemic influences (e.g., parents), and promote communication of these differences toward reconciliation. The clinician should also acknowledge stigma among all stakeholders in the client's care, and foment discussions on how to work with stigma to achieve shared treatment goals.

- Consider the chronosystem as part of treatment planning. Specifically, as part of "closing a treatment case", make plans for how to meaningfully follow up over six months., a year, or beyond.

Our hope is collectively that each subdiscipline recognizes the extant semantic complexity in the other, simultaneously looking for "translations" into their own specific dialect. Practicing "crosswalking" in this manner will avoid theoretical and interdisciplinary bifurcation and encourage more seamless collaboration in settings where interdisciplinary communication is increasingly common and warranted.

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