*Corresponding author
Professor Shane R Jimerson, Professor at the University of California-Santa Barbara, Department of Counseling, Clinical, and School Psychology, Santa Barbara, USA

Review Article

Toward a Critical Transactional Ecological Developmental Theory: Informing and Advancing Practice and Science

Yuexin Zhang[1], Mihya Weber[1], Lakhvir Kaur[1], Alessandra Mittelstet[1] and Shane R Jimerson[2*]

[1]Doctoral student at the University of California, Santa Barbara, USA
[2]Professor at the University of California, Santa Barbara, USA

Abstract

Conceptual foundations inform our professional activities as practitioners and scholars. This paper describes a theoretical framework to inform and advance scientific and applied work, recognizing the numerous factors influencing the trajectory of human development and the imperative of transforming the traditional "ways of being" in the field of education and applied psychology through the lens of critical theories. The central tenets of a critical, transactional, ecological, and developmental perspective are grounded in theories from developmental scholars including the works of Sameroff (e.g., transactional), Bronfenbrenner (e.g., ecological), Bowlby (e.g., relationships), and the Frankfurt school (e.g., critical theory). An emphasis is placed on the dynamic and reciprocal transactions between the individual and their environment across time and the social complexities brought by the intersection of these ongoing, dynamic, and reciprocal social relations. This paper also includes a description of empirical support informing these conceptual foundations with special attention to longitudinal studies demonstrating various influential factors across diverse developmental trajectories. Also included is a discussion of, implications informing prevention and intervention efforts to promote academic and social-emotional learning for all children, future research directions, and advocacy stance to promote shift and change to interrupt the long-standing social and educational injustices in the field of education.

Introduction

The purpose of this paper is to provide a developmental theoretical framework to inform scientific and applied work in the field of education. The following recognizes that numerous factors influence the trajectory of human development. The central tenets of a critical, transactional, ecological, and developmental perspective includes a synthesis of various contributions and influences grounded in theories from leading developmental scholars including the works of Sameroff (e.g., transactional), Bronfenbrenner (e.g., ecological), Bowlby (e.g., attachment), and the Frankfurt School (e.g., critical theory). The following provides an overview of the conceptual foundations that inform practice and research, with an emphasis placed on the dynamic and reciprocal transactions between the individual and their environment across time and the social complexities brought by such non-ceasing and reciprocal social relations. This overview also describes empirical support informing these conceptual foundations with special attention to longitudinal studies demonstrating these various influential factors across diverse developmental trajectories. A discussion of implications informing future research and practice endeavors as well as prevention and intervention efforts to promote academic and social-emotional learning for all children is presented.

Contemporary Developmental Theories

Contemporary developmental science has evolved from the individual, uniform, and domain-specific focus into a relational approach, which highlights multiple factors influencing development across the lifespan [1]. Four models that encompass the contemporary essentials in human growth include the personal change model, the contextual model, the regulation model, and the representation model [2].

Personal change model

The personal change model is essential in understanding the evolution and development of competencies beginning in infancy as it focuses on the self rather than the context. Such competencies include but are not limited to language acquisition, cognitive ability, social-relational development, and identity construction, which evolve from one to multiple, from simple to complex from infancy across development. Bountiful New-Piagetian theories are complementary to the personal change model in the evolution and prosperity of cognitive competencies, ranging from perception, learning, memory, reasoning to problem solving [3]. Vygotsky's zone of proximal development, or the distance children can perform beyond their current level, also resonates with the personal change model in that both place emphasis on children's growth in competencies and capacities [4].

Contextual model

The contextual model, on the other hand, emphasizes an external lens in understanding the individual's development which is under the impact of distinctive life experiences and environmental exposures. The contextual influence on personal development was neglected in early psychological theories. For instance, Piaget's cognitive development theory heavily emphasized the personal change processes, but factors such as language and cultural influences which also can shape cognitive activities were largely absent [3]. In contrast, Bronfenbrenner's social-ecology systems theory vividly illustrates

the contextual model as it concentrates on external social settings transforming individuals in a direct or indirect way [5].

Regulation model

The regulation model emphasizes the individual's ability to assimilate or adapt to different experiences not merely by self-regulation but also by other-regulation. The ability to self-regulate is deeply influenced and even cultivated by the regulation actions of others, in most cases, one's caregivers. This dynamic relation between self and other across time, leads to the notion of Transactional regulation, which adds a dialectical component to the self and the other. The individual is no longer a passive receptacle for stimuli coming from the context, but instead is actively impacting and shaping the experiences from the social surround.

Representation model

The representation model refers to how experiences and the external world are encoded or internalized. Representations, which are not always an accurate reflection of the context, constitute the individual's thoughts, understandings, expectations, and views of the world. Examples that exemplify this concept involve, among others, individuals' cultural identities and relationship working models. Linked with Bowlby's ethological theory, representations towards child-caregiver relationship reflect the quality of attachment, which impacts all aspects of social-emotional development. For example, children with secure attachment and positive representation towards the child-caregiver relations tend to demonstrate higher social skills, self-esteem, and fewer behavior problems compared to their insecurely attached counterparts [6]. The representations made by individuals during early childhood or infancy also have a significant impact on subsequent development during adolescence and throughout adulthood [2].

A Unified Theory of Development

By unifying the four models discussed above, Sameroff's transactional model of development adopts a dialectical philosophical perspective, which amalgamates the bidirectional and interdependent effects of nature and nurture with individual and contextual changes on life trajectories. This unified theory consists of two formulations: the structural formulation and the process formulation. The former concept refers to the self in a certain context; the latter added a chronological time dimension to the model.

Structural formulation

The structural formulation is conceptualized based on the dialectical perspective that nature and nurture mutually constitute each other. Even within the individual, interactions between and within the psychological and biological processes never cease. First, the psychological domain is composed of numerous subsystems transacting with each other. These subdomains include cognitions, emotions, identity, mental health, and so forth. Within the biological realm, some other subsystems, such as neurophysiology, neuroendocrinology, and genomics, overlap and interact with one another imperceptibly. Second, the biological processes serve as a foundation for psychological functioning and development. These two components interact mutually and together form the self-regulated biopsychological system. When it comes to nurture, or context, the interplay among a set of environmental organizations, which typically involves family, school, community, among others, has featured the other-regulation system. The context plays a vital role in shaping children's development. For instance, social settings with abundant resources, as found in higher socioeconomic status groups, help to reimburse for earlier adversity. The individual in the context also actively influences the other-regulation system, such that a child with temperamental difficulties has a higher tendency to trigger parental maltreatment and as a result, is more likely to experience abuse or neglect [7]. The biopsychological system along with the other-regulation system constitutes the structural formulation.

Process formulation

Early on in the psychological field, the stage theory was considerably prevalent among multiple schools. Freud developed a progression of psychosexual stages. Erickson's eight stages of life expanded the sequence of freud's stages to the entire life cycle, which fully covers the course from infancy to old adulthood. Erickson postulated a most crucial developmental encounter for each stage. The Stage Theory, however, has met with criticism due to its failing to account for other empirical evidence. The assumptions that all stages are culturally universal and that the stages naturally unfold according to biological maturation are not compelling and thus, need revisions. What has been commonly acknowledged is the sentiment that individuals grow from neophytes to experts with cumulative competencies developed as times go by. Likewise, contemporary models of development also have highlighted a dedication to studying the course of human life. The process formulation factors a time component in the transactional model of development in the service of explaining personal change across the lifespan. Instead of adopting a stage-like philosophy where an individual's development is more of a result of biological functions, the process formulation conceptually focuses on the dynamic interplay between nature and nurture which function together as the catalyst for lifelong growth and changes. The biopsychological model interacts with the other-regulation system unceasingly, and with the absence of the time factor, such interactions would not exist. Therefore, the process formulation plays an indispensable part in the transactional model due to this essential time dimension component.

Critical Transactional Ecological Developmental Model

The following provides a synthesis of the central tenets of key conceptual foundations, emphasizing critical, transactional, ecological, and attachment as primary considerations.

Transactional

The transactional model [2,7,8] emphasizes the dynamic reciprocal effects of human development across time. Thus, the transactional model is not unidirectional as it emphasizes the dynamic and reciprocal importance of external factors in shaping the development of a child as well as how the child influences the people around them and their external environment. The transactional model emphasizes that development and life outcomes emerge from a combination of individual differences and life experiences resulting from dynamic reciprocal interactions between the individual, others, and the environment throughout time. The model recognizes numerous influences such as social class, gender, education, culture, the psychological well-being of caregivers, and family dynamics together all play an integral role in shaping an individual. Sameroff [7] explains the concept of the environtype which includes the family and cultural socialization patterns in which the individual lives. Thus, we integrate the works of Bronfenbrenner and Bowlby to further support our view of vital factors salient to developmental outcomes. To understand the contextual factors shaping the individual Bronfenbrenner's levels of environmental systems contributes important considerations. To better understand relationships and their impact on developmental trajectories, Bowlby's work on parental attachment will be discussed. Additionally, as the child develops, different aspects of their environment will become more salient to their current expression of self [7]. Thus, to fully understand the child as they are in the present, it is critical to understand previous development, relationships, and contexts as past influences and how they relate to the individual's current circumstances.

Ecological systems

The ecological systems theory [9,10] describes the complex interactions of environmental and individual factors involved in development. Bronfenbrenner highlights that the interactions between a child and their family, home situation, and interpersonal relationships (microsystem) will shape how they interact with their extended environmental systems (meso, exo, and macrosystems). Additionally, the surrounding area of the child's activities will impact their life experiences. The security of the parent's job, quality of their education, the safety of their home neighborhood and their school, and family's socioeconomic status (exosystem and macrosystem) will each influence developmental trajectories depending on the interactions with the individual. Given the attention to the multiple systems involved in shaping individual growth, Bronfenbrenner's ecological systems theory serves as a model informing the development of culturally competent practices and considerations for research designs. Since each system level in the model will differ depending on the culture of an individual, their family, and the society they reside, considering these aspects is essential for effective dissemination of research to practice.

Critical theory

Critical theory, a form of cultural criticism, was practiced by the Frankfurt school that views aspects of power and knowledge as produced, disseminated, and ultimately linked [11,12]. The theoretical schematic of critical theory rooted in Kantian critique stakes out a position against prejudice and ill-grounded ideas which requires reflection on one's presuppositions and basic position. Another stance of critical theory associated with a Hegelian concept of critique aims at criticizing one-sided

Citation: Yuexin Zhang, Mihya Weber, Lakhvir Kaur, Alessandra Mittelstet and Shane R Jimerson (2022) Toward a Critical Transactional Ecological Developmental Theory: Informing and Advancing Practice and Science. Curr Res Psychol Behav Sci 3: 1041

Page 2/6

positions and developing dialectical perspectives that confront and reject oppressive or false features of a position. Marxian critique not only focuses on radical examination of existing ideologies and practices, but also calls for social transformation to free individuals from systematic oppressions and create a healthier human culture and society [13]. Critical theory plays a key role in education and applied psychology as it attends to the intertwined relationship between educational ideas, policies, practices, and larger oppressive political and ideological processes and social realities, which contributes to deeper understanding of social justice and equity in education. Critical theory also values revolutionary actions aiming at shifting and transforming the oppression and reproduction of inequality in the education system, which sheds light on the implications for the educators' research and practice [14]. Contemporary applications of critical theory include critical race theory [15], critical disability theory [16,17], intersectionality theory [18,19], and critical policy analysis [20].

Empirical Evidence Illustrating the Transactional Model of Development

Across the decades since the emergence of the transactional model of development [8], there has been an abundance of scholarship that illustrates the central tenets of the model. The empirical evidence supporting the transactional model of development includes findings from numerous longitudinal studies across developmental periods [21]. Research on the bidirectional transactions in the parent-child dyad and the effect on the child's development is blossoming since the development of the transactional model. One example reflecting the unified transactional theory is Lynch & Cicchetti's [22] longitudinal study on child maltreatment, community violence, and the development of psychopathology. This ecological-transactional analysis substantiated the interactive relationships between exosystem, microsystem and the child within the context through the findings that 1) In the community with higher violence level, children experienced correspondingly higher rates of maltreatment from caregivers; 2) Maltreated children demonstrated more internalizing and externalizing behavioral problems; and 3) Children with higher levels of behavioral difficulties contributed to the preserving circumstantial challenges and suffered from increased victimization by community violence in this vicious cycle. Another instance involves a three-generational longitudinal study on parenting and the development of effortful control in children, who in this study matured from age 3 to 13-14, indicated a bidirectional association between children's temperament and parents' practices [23]. Effortful control, one dimension of temperament, is pertinent to executive control and the capability to manage attention, activate a plan, and inhibit or activate behavior as need to adapt to circumstances. Inferior effortful control is positively associated with externalized behavioral problems, whereas children excelling at effortful control tend to exhibit less substance abuse and better academic outcomes in early adulthood [24]. The findings resonate with the transactional model which postulates a moment-by-moment and dynamic interplay between parents and children, one influencing another over the short and long term. The research found that parenting predicted children's later effortful control and better child effortful control forecasted lower levels of poor parental discipline [23].

Evidence demonstrated in an additional long-term study exploring the transactional relation between parenting quality and early childhood regulations also supports the theory of a moving bidirectional system. The analysis results reveal a spillover effect from maternal contextual strain to child adjustments and from child regulation to the parenting context. Specifically, boys with behavioral dysregulation at 24 months were linked with lower maternal sensitivity and poorer maternal limit setting at 42 months, which in turn led to lower levers of academic achievement at 72 months [25]. Such findings enrich the understanding of the transactional relations in the child-parent dyad and enlighten practical implications in the realm of early regulation and academic success. Although there have been multifarious developmental and psychopathological studies on the transactional model and the majority of them have shown evidence of tenacity, more longitudinal research with diverse participants and manifold study focuses beyond the scope of the parent-child dyad are needed to advance the transactional science and to inform practices. Research highlights the reciprocal influences of early development impacting academic success in early education. For instance, Gershoff, et al. [26] describe in their study the reciprocal impact of parent learning support and child reading ability. Results from this study revealed that parents who were involved in their child's learning throughout kindergarten predicted reading ability through the third grade. This study also found that as the children's reading ability improved, the parents spent less time supporting [26]. This demonstrates a transactional relationship between the parental influences on the students' reading success, and the students' reading improvements on the parent behavior across time. More recently, Goble and colleagues

(2017) examined the transactional effect of Head Start preschool children through the first grade. Positive relationships across time were found between positive social interaction skills, school engagement, and academic achievement (Goble et al. 2017). Understanding these relationships is helpful for educational professionals to consider when aiming to implement early intervention services particularly for students from low SES backgrounds. Further, these relationships highlight the critical value of promoting social-emotional learning in our schools particularly in early education. Felner & DeVries [27] found that parental education is a significant predictor of school performance, but not only for children in hardship. This is particularly relevant when working with students who may have parents with lower education and ensuring the families have access to information and resources important for student success. Results from this study can guide school staff towards understanding the needs of these students and utilizing effective strategies to promote meaningful parental involvement in education.

Based on reviews of current literature, students with the following identities are at an elevated risk for bullying and victimization: racial/ethnic minorities, LGBTQ+, learning/developmental disabilities, low SES, and students with health problems [28]. Understanding the impact of these influences is essential to identify students at-risk for negative experiences during the school day that can adversely impact their ability to succeed academically. With a transactional-ecological approach, professionals can also look within these subgroups of students to evaluate the protective factors they currently have that are promoting their resiliency. This information can help to inform the development of effective prevention and early interventions to target at-risk students and ensure that school staff meets the needs of those students to create a positive school climate. Sroufe [29] emphasizes the complex dynamic relationship between infant attachment and adult outcomes in a thirty-year longitudinal study. Results from this study emphasize the role of infant attachment in initiating the developmental trajectory for valuable abilities such as emotion regulation, resilience, social competence, and educational outcomes [29]. London, et al. [30] reveal how the protective factor of secure child-adult attachments impact children in the face of adversity. They suggest that secure attachments can alleviate the post-traumatic stress symptoms experienced following exposure to violence. Given the strong correlates of early attachment demonstrated in these studies, we find these influences necessary to consider when working with students and their families. Further, results from the Michigan Longitudinal Study demonstrated a relationship between the children's externalizing behaviors and co-regulation between parent and child across time as reported by mothers, fathers, and teacher [31]. These findings further support the emphasis of the transactional model [7] regarding the influence of adult self-regulation as related to the development of these skills in children.

Implications for Research

The transactional ecological model of development, emphasizing a person-context-process model, has contributed to a more intricate view of development marked by the inseparable relations between nature and nurture. Researchers, as the knowledge producer, are unexceptionally under the influences of social and bio-psychological processes. Group interests, values, and identities represented by the researcher inevitably shape and mediate the knowledge produced. The inward-directed introspective critique proposed by critical theory provides an approach for researchers to confront the biases associated with their group interests, ideological affinities, and social positions to alleviate the impact of these interpersonal or sociocultural dynamics on the neutrality and objectivity of the study design, analytic process, and conclusion derived. To be free from any subjective influences is not a goal of the inward-directed introspective process, rather critical theory calls for researchers to enter into ongoing investigations of their possible complicity in a current or past system of oppression [32]. One way to foster such investigations in research can be inviting participants as the co-investigators rather than passive subjects within a study to facilitate stronger research design and produce critical knowledge [33]. Another, for scholars, is the process formulation in the transactional ecological model that appeals to more research that examines development and to expand the understanding towards the science of prevention and intervention. Such a demand inspires the pursuit of the advancement of longitudinal studies about compromised development among children, especially those from disadvantaged groups without access to resources that can compensate for the contextual or personal adversity. Due to the considerable complexity in such endeavors, current studies exhibit a few common limitations in the methodology and measurement constructs of longitudinal studies, including data subject to bias (e.g., observational, other-reported), compromised study length, limited representation in sample collected, and subjective study method impacted by

researchers' values and group interests. All of these areas deserve to be remedied by future research. A third way, given the fact that ample current research on the child-parent microsystem is permeating the transactional scientific efforts, is the ongoing need for more extensive studies on the other systems, including school, community, the sociopolitical environment, and so forth. A critical researcher should spare no efforts in producing knowledge that can empower oppressed groups or confront a perpetuating unjust system [11]. Researchers in the field of education who ally with this critical orientation strive for generating research that can elucidate the injustice and inequity that exist in K-12 education [11].

Implications for Practice

Critical theory connects research to action. Although there are still needs for learning about basic developmental science through transactional analysis, the limitations in knowledge in the transactional character of nature and nurture should not restrain applied developmental scientists from facilitating changes in the real world where many children and families' needs currently remain unmet or even neglected. Absolute prediction of the life trajectory of any particular child or family is unrealistic, for which the focus should not be merely on assuring massive research advances, instead on enforcing meaningful changes based on the contributions to supporting the development of children, families, and the society [7]. Below, we discuss the implications of the transactional ecological developmental model as it relates to prevention and intervention for academic and mental health challenges in the school. Through this theoretical lens, utilizing a Multi-Tiered System of Support (MTSS) [34] for academics and social-emotional learning, schools can best serve and meet the diverse needs of all students. This includes establishing a universal (tier 1) level of prevention and support efforts aimed at promoting student success in academic and social-emotional learning, tier 2 for students who need additional support, and tier 3 for students who require intensive individual interventions. The following explore how education professionals can utilize an MTSS infrastructure to take a holistic approach to prevention and intervention consistent with our theoretical orientation.

Prevention

Preventative strategies are inherent in the MTSS model. With the understanding that students come from diverse backgrounds and their needs may manifest differently in a variety of settings, we emphasize the value of universal screening for academics and social-emotional health. By utilizing these practices, we can identify students who may need additional academic or mental health support. These practices can be used to initiate discussions between school staff and families and guide interventions to best support the student's needs. Further, this theoretical orientation has implications for disciplinary practices in school settings. Considering that from this theoretical perspective adults and children influence each other equally, school staff should be mindful of these tendencies when disciplinary action is called for. Discipline policies should be designed to facilitate skills or environmental changes the student needs to prevent the infraction from repeating. This would also model for the student appropriate behavior and strategies and provide a supportive environment conducive to learning replacement behaviors. These strategies are reflected in contemporary evidence-based practices such as incorporating Positive Behavior Interventions and Supports (PBIS) into a Multi-Tiered Systems of Supports (MTSS) infrastructure. This approach is further supported when considering research which demonstrates that children who engage in negative behaviors often provoke negative reactions, which further elevates challenging behaviors [35]. When considering traditional disciplinary procedures which are often exclusionary (e.g. suspension) the theoretical foundation which we have outlined suggests that these methods are ineffective at promoting positive change in student behavior. As the foundational theories for our conceptual approach (e.g., Sameroff, Bronfenbrenner) responding to challenging behaviors in a way that maintains a positive relationship with the student is critical to foster success in other areas such as social-emotional and academics [36]. From this lens, creating a school environment that is positive and safe is a necessary primary factor for student success and promoting prosocial behavior [37].

Intervention

Some students will require additional support beyond the universal level. Constructing effective interventions requires understanding the multidimensional components involved in student progress. When students require additional assistance above the tier one level of support, the school system can utilize tiers two and three of the school support system to accommodate the needs of the student for them to reach their academic goals.

Data-based decision making: The transactional framework contributes to an increased awareness that students' academic, behavioral, and social success is due to numerous contextual and individual factors which differ from individual to individual. Thus, it is essential to understand how risk or protective factors across each domain transact with one another and impact the students' overall developmental profiles. Therefore, it is essential to gather the developmental history of the student and include the family and school staff throughout the decision-making process. Given the fact that individuals are exposed to unique circumstantial and contextual conditions, it is not tenable to implement universal interventions to all students without considering the considerable variability of functioning profiles. Therefore, when designing school-based interventions, individual characteristics of the student, people they interact with, and how these interactions change within the student's different environments should be incorporated. When deciding how to support the student, we propose that it is important to know the following information: the child's developmental history including if developmental milestones were met as expected, past and current family dynamics, cultural factors (what is typical and expected for this child and this family), if they child has faced any adverse events, what are the students strengths academically and socially, when the challenges began, what behaviors are exhibited or not exhibited, under what circumstances is the student demonstrating challenges, and what factors could be contributing to the maintenance of the challenge, and what interventions have been attempted and why might they have been ineffective. We highlight the importance of obtaining parent, teacher/staff, and (if developmentally appropriate) student insight on these factors. Through collaboration with the student, teachers and staff, and caregivers and encouraging family involvement in the school, leadership teams can make well-informed decisions regarding the student's intervention and progress monitoring techniques. The process formulation of the transactional model factors a time component emphasizing changes. It is likely that the individualized interventions which originally yield positive treatment outcomes are no longer effective due to dynamic changes over time. In this case, it is also important to consider updated treatment to assure optimum intervention outcomes based on progress monitoring data.

Interventions targeting different contextual and personal transacting systems: Many interventions in the school setting are aimed at promoting self-regulation strategies in the students. Self-regulation skills in children are often seen as an indicator of healthy social-emotional functioning [38,39]. These skills are also relevant for academic success. Based on the transactional-ecological model, the child can best learn these skills from adults who model self-regulation and promote an environment that fosters self-regulation [7]. This is important for education professionals and scholars to consider when working with children to ensure that adults are displaying these characteristics and encouraging the other adults who interact with the child to also exhibit these skills to further support the student in developing these skills. This may include consultation with parents and teachers to provide parents with strategies to facilitate these skills in the home and teachers how to encourage these skills in the classroom. From this theoretical orientation, creating a positive adult support system and overall encouraging environment for the child to learn is likely to facilitate the acquisition of these skills over time. The structural formulation posits the biopsychological system as an outcome of the transactional relations between the biological processes and psychological functioning. In other words, the individual's cognitive, emotional, social subdomains interact and shape one another in an intricate way, which gives birth to the self-regulated system of the self. That being said, educators who seek to optimize students' academic, social and emotional development not only need to understand how to reinforce students' performances in each domain but also to recognize how these realms can support or inhibit the development of each other. As described above, this sort of practice reflects the philosophy of the Multi-Tiered System of Supports (MTSS). Since it is usually a complex combination of different influences that exacerbates students' struggles, multifactorial interventions dedicated to address risk factors are more likely to support systematic reorganization.

Equity and social justice: The bidirectional nature of the transactional model implies that individuals in the context are not passive recipients of the external impacts, but instead can be active contributors to systematic changes. Critical theory also refers to individuals as under the constant social relational forces and urges for the investigation and contemplation of the ways in which individuals as well as the discipline as a whole are complicit in perpetuating the status quo [32]. Education professionals are urged to become the critics of the system and proactively advocate for the underserved and be involved in endeavors pursuing equity and social justice in education. Universities as a place inhabited by intellectuals and technocrats play a vital role in producing critical modes of thinking for society. Traditionally policies concerning social justice and equity in university training programs (e.g., teaching,

applied psychology) have been weak or limited [14]. Training programs need to be critical about the current training structure with more components regarding preparing educators for social chance, social justice, and equity. One way to start is to incorporate training philosophy and mission into program documents with clear goals and action so that lofty vision and philosophy can be translated into achievable steps. In addition, a substantial body of research has documented a shortage of minority educators, which supports the importance of recruitment and retainment of culturally and linguistically diverse students and faculty members in training programs [40-42]. Program directors are encouraged to examine effective recruitment and retention strategies to cultivate a more diverse program environment and address the continued issues of a shortage of minority educators. Universities should also be able to offer society an example of how to forge social change through communicative dialogue and reason [12], giving a voice to the otherwise voiceless and marginalized.

Social change arises from simple articulation from a research laboratory; rather, it needs to be forged and nurtured in negotiations, sacrifices, and struggles in the political system and in the streets [12]. According to the five specific ways of Nieto [43] proposed to "place equity front and center," educators situate equity by 1) Staking out a firm position on social justice and diversity in practice; 2) Making social justice ubiquitous in their practice; 3) Making daily practice (e.g., teach, consult, collaborate) as a continuous process of transformation; 4) Challenging biases and unjust; and 5) Developing a community of critical friends. A critic does not have to be intolerant in all cases but needs to be able to offer society a lens to the critical aspects needed to be considered to pursue the dream of social justice education and peace. The transactional-ecological framework emphasizes a holistic perspective to help practitioners and scientists to understand the relational dynamics between individuals and the context [44,45]. Under this framework, positive systematic changes need to occur in order to sustain long-lasting and positive individual growth. When it comes to intervention planning and implementation, adopting a positive psychology perspective is associated with prevention and intervention mechanisms aiming at helping individuals and groups discover their latent resources and strengths and bring them to fruition [46].

Conclusion

The conceptual foundations described herein offer a research-based framework under which a holistic perspective is cultivated for practitioners and scientists to understand the relational dynamics between individual and the context through a critical lens. The understanding of the bidirectional and interactive relations between nature and nurture across lifespan facilitates the development of contextual sensitivity without overlooking individual differences and personal potentials to make systematic differences. In addition, the transactional approach's complexity and inclusiveness allow additional theoretical ideas to nest inside, which opens up the possibility for many avenues of intervention and research. The dialectical transaction between applied and scholarly work provides insights for future practices and forward the developmental science in depicting, explaining and facilitating development [47]. Practice and research in education and applied psychology should be guided by critical, transactional, ecological, and developmental conceptual foundations. Recognizing the individual, history, context, and these dynamic reciprocal interactions across time, it is important to take a holistic and critical approach to meeting student needs. Because schools are a place where most children are better able to access necessary services, establishing infrastructures that can support students and combat their social-emotional or academic struggles is critical. The child's interactions with the people in their life and the environmental systems should be considered and incorporated when designing interventions.

By using an MTSS framework in schools, professionals can maximize resources within their institution to identify students in need of various supports and address the multidimensional factors contributing to their disturbances by utilizing the various modes of research-based interventions that each tier can offer. Improving educational environments and learning strategies are most effective when using interventions that recognize the diverse strengths students possess. It is not enough to focus solely on the student as they are in front of us when planning interventions [48]. We must also consider past and current contextual factors that influence adaptation and adjustment at school. Involving key adults in the student's life and considering the numerous influences in their different environments when selecting interventions can maximize the effectiveness in facilitating positive growth and development. Apart from all the prevention and intervention efforts, education and applied psychology professionals should also engage in critical analysis of contemporary systems and form alliances and coalitions that help create the conditions to empower marginalized communities.

References

1. Lerner RM (1998) Theories of human development: Contemporary perspectives. In: Damon W, Lerner RM (Eds.), Handbook of child psychology: Theoretical models of human development. John Wiley & Sons Inc, USA, p. 1-24.

2. Sameroff A (2010) A unified theory of development: A dialectic integration of nature and nurture. Child development 81(1): 6-22.

3. Barrouillet P (2015) Theories of cognitive development: From piaget to today. Developmental Review 38: 1-12.

4. Crain W (2015) Theories of development: concepts and applications. (6th edn.), Psychology Press, UK, pp. 1-448.

5. Bronfenbrenner U (1994) Ecological models of human development. Readings on the development of children 2(1): 37-43.

6. Berk LE (2013) Child development. (9th edn.), Boston: Pearson Education.

7. Sameroff AJ (2009) The transactional model of development: How children and contexts shape each other. American Psychological Association, p. 3-21.

8. Sameroff AJ, Chandler MJ (1975) Reproductive risk and the continuum of caretaking causality. In: Horowitz FD (Ed.), Review of child development research, University of Chicago Press, US, 4: 187-244.

9. Bronfenbrenner U (1974) Developmental research, public policy, and the ecology of childhood. Child Development 45(1): 1-5.

10. Bronfenbrenner U, Morris PA (2006) The bioecological model of human development. In: Lerner RM, Damon W (Eds.), Handbook of Child Psychology: Theoretical Models of Human Development. John Wiley & Sons Inc, US, pp. 793-828.

11. Kincheloe JL, Mclaren P (2011) Rethinking critical theory and qualitative research. In: Hayes K, Steinberg SR, Tobin K (Eds.), Key works in critical pedagogy. Springer Publishers, USA, pp. 285-326.

12. Rexhepi J, Torres CA (2011) Reimagining critical theory. British Journal of Sociology of Education 32(5): 679-698.

13. Kellner D (2003) Toward a critical theory of education. Democracy & Nature 9(1): 51-64.

14. Wiedeman CR (2002) Teacher preparation, social justice, equity: A Review of the literature. Equity & Excellence in Education 35(3): 200-211.

15. (2001) Critical race theory: An introduction. Delgado R, Stefancic J (Eds.) New York University Press, USA.

16. Gillies J (2014) Critical disability theory. In: Michalos AC (Ed.), 2014th (edn.), Encyclopedia of Quality of Life and Well-Being Research. Springer publications, US, pp. 57-311.

17. Minich JA (2016) Enabling whom? Critical disability studies now. Lateral 5(1).

18. Smith B, Colle CR (1986) The combahee river collective statement: Black feminist organizing in the seventies and eighties. Kitchen Table Press, p. 1-21.

19. Crenshaw K (1989) Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics. University of Chicago Legal Forum 1989: 139-167.

20. Taylor S (1997) Critical policy analysis: Exploring contexts, texts and consequences. Discourse: Studies in the Cultural Politics of Education 18(1): 23-35.

21. Leve LD, Cicchetti D (2016) Longitudinal transactional models of development and psychopathology. Development and psychopathology 28(3): 621-622.

22. Lynch M, Cicchetti D (1998) An ecological-transactional analysis of children and contexts: The longitudinal interplay among child maltreatment, community violence, and children's symptomatology. Development and psychopathology 10(2): 235-257.

23. Tiberio SS, Capaldi DM, Kerr DC, Bertrand M, Pears KC, et al. (2016) Parenting and the development of effortful control from early childhood to early adolescence: A transactional developmental model. Development and Psychopathology 28(3): 837-853.

24. Piehler TF, Véronneau MH, Dishion TJ (2012) Substance use progression from adolescence to early adulthood: Effortful control in the context of friendship influence and early-onset use. Journal of Abnormal Child Psychology 40(7): 1045-1058.

25. Yates TM, Obradović J, Egeland B (2010) Transactional relations across

contextual strain, parenting quality, and early childhood regulation and adaptation in a high-risk sample. Development and psychopathology 22(3): 539-555.

26. Gershoff E, Aber LJ, Clements M (2009) Parent learning support and child reading ability: A cross-lagged panel analysis for developmental transactions. In: Sameroff A (Ed.), The transactional model of development: How children and contexts shape each other. American Psychological Association, USA, pp. 203-220.

27. Felner RD, DeVries ML (2012) Poverty in childhood and adolescence: A transactional-ecological approach to understanding and enhancing resilience in contexts of disadvantage and developmental risk. Handbook of Resilience in Children, pp. 105-126.

28. Hong JS, Espelage DL (2012) A review of research on bullying and peer victimization in school: An ecological system analysis. Aggression and Violent Behavior 17(4): 311-322.

29. Sroufe LA, Egeland B, Carlson EA, Collins WA (2005) The development of the person: The minnesota study of risk and adaptation from birth to adulthood. Guilford Press, US.

30. London MJ, Lilly MM, Pittman L (2015) Attachment as a mediator between community violence and posttraumatic stress symptoms among adolescents with a history of maltreatment. Child Abuse & Neglect 42: 1-9.

31. Olson SL, Sameroff AJ, Kerr DCR, Lopez NL, Wellman HM (2005) Developmental foundations of externalizing problems in young children: The role of effortful control. Development and Psychopathology 17(1): 25-45.

32. Sabnis SV, Proctor SL (2021) Use of critical theory to develop a conceptual framework for critical school psychology. School Psychology Review, p. 1-15.

33. Brown TM, Rodriguez LF (2009) From voice to agency: Guiding principles for participatory action research with youth. Special edition: Youth in participatory action research. New Directions for Youth Development 2009(123): 19-34.

34. (2016) Jimerson SR, Burns MK, Heyden AMV (Eds.), The handbook of response to intervention: Science and practice of multi-tiered systems of support. 2nd (Edn.), Springer Science, USA.

35. Patterson GR, Bank L (1989) Some amplifying mechanisms for pathologic processes in families. In: R. Gunnar M, Thelen E (Eds.), Systems and development, Erlbaum publishers, pp. 167-209.

36. Feuerborn L, Chinn D (2012) Teacher perceptions of student needs and implications for positive behavior supports. Behavioral Disorders 37(4): 219-231.

37. Osher D, Dwyer K, Jimerson SR (2006) Safe, supportive, and effective schools: Promoting school success to reduce school violence. In: Jimerson SR, Nickerson A, Mayer M, Furlong MJ (Eds.), The handbook of school violence and school safety: From research to practice. Routledge, UK.

38. Charles ST, Carstensen LL (2007) Emotion regulation and aging. In: Gross J (Ed.), Handbook of emotion regulation, Guilford Press, USA, pp. 307-327.

39. Diamond LM, Aspinwall LG (2003) Emotion regulation across the lifespan: An integrative perspective emphasizing self-regulation, positive affect, and dyadic processes. Motivation and Emotion 27(2): 125-156.

40. Ingersoll RM, May H, Collins G (2019) Recruitment, employment, retention and the minority teacher shortage. Education Policy Analysis Archives 27: 37.

41. Rogers MR, Molina LE (2006) Exemplary efforts in psychology to recruit and retain graduate students of color. American Psychologist 61(2): 143-156.

42. Scott LA, Alexander Q (2019) Strategies for recruiting and retaining black male special education teachers. Remedial and Special Education 40(4): 236-247.

43. Nieto S (2000) Placing equity front and center: Some thoughts on transforming teacher education for a new century. Journal of teacher education 51(3): 180-187.

44. Bradley RH, Corwyn RF (2002) Socioeconomic status and child development. Annual review of psychology 53(1): 371-399.

45. Halbur D (2011) Developing your theoretical orientation in counseling and psychotherapy. 4th (edn.), Pearson, UK, pp. 1-144.

46. Kerckhoff AC, Glennie E (1999) The Matthew effect in American education. Research in Sociology of Education and Socialization 12(1): 35-66.

47. Sheldon KM, King L (2001) Why positive psychology is necessary. American psychologist 56(3): 216-217.

48. Waterman AS (2013) The humanistic psychology–positive psychology divide: Contrasts in philosophical foundations. American Psychologist 68(3): 124-133.