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

Yuexin Zhang¹, Mihya Weber¹, Lakhvir Kaur¹, Alessandra Mittelstet¹ and Shane R Jimerson²

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

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 model 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 receptor 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 to ethological theory, representations towards child-caregiver relationships 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 intersecting 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. Second, the biological processes serve as a foundation for psychological functioning and development. These two components interact mutually and together form the self-regulated biopsychosocial model. 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 biopsychosocial 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 situational factors, such as caregiver traits, may influence developmental outcomes.
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 the 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 psychopathological symptoms. This ecological analysis emphasizes that the complex dynamic relationships 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 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 on the development of the child’s 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 maintaining that parents develop bidirectionally in the context of their environment. The role of the child influences the parent behavior and vice versa, creating 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 level setting at 42 months, which in turn led to lower levels 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 a 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 proficiency on the parent behavior across time. Moreover, Goble and colleagues (2017) examined the transactional effect of Head Start preschool children through the first grade. Various 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 aid look within these subgroups of students to evaluate the protective factors they currently have that are promoting their resiliency. This information can help in 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. This ecological analysis emphasizes that the complex dynamic relationship between infant attachment and adult outcomes is 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 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.

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 contextual 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), their behaviors 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 (students) 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 prevention process formulation. The process formulation focuses on identifying the factors, organizing them into 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., suspensions) 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., Sameoff, 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.
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 change, 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 retention 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 without overvaluing individual differences and personal potentials to make systematic differences. According to the five specific ways of Nieto [43] proposed to "place equity front and center," educators situate equity by 1) Staking 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 conversation; 4) Challenging biases-unequal and unjust; and 5) Developing 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 overvaluing 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 that goes beyond the individual 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].

References