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ARTICLE

Cultivating compassion across development: A multi-systemic framework for intervention and measurement

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Abstract: Our humanity affords us abilities that can be harnessed to harm or to heal. One could argue that the survival of our humanity is strengthened when we harness healing. Compassion is a capacity we as humans can draw on for just this purpose. It is increasingly recognized as essential for individual and societal well-being. Yet most existing models and measures are derived from adult populations and overlook how compassion emerges, changes, and can be cultivated across childhood and adolescence. This paper aims to advance the developmental science of compassion by presenting two complementary models that together offer a comprehensive account of the contextual foundations and developmental processes of compassion development from early childhood through late adolescence (ages 3-18). The first model synthesizes four intersecting systems to provide a topographical understanding of the contextual architecture shaping how compassion is rooted in and progresses through early development. These include motivational, emotional, relational, and cultural contexts that interact with human development in ways that directly shape how we can know compassion through observable behaviors, relationship interactions, ways of communicating, and ways of thinking. The second model translates these contextual influences into a dynamic developmental sequence involving five interrelated psychological processes: awareness of suffering, appraisal of its meaning, motivation to respond, compassionate action, and the impact and meaning-making that follow. Although these processes unfold in a general progression, they interact recursively; for example, early helping behaviors can shape later emotional regulation, relational attunement, and ethical reasoning. To support empirical research and applied work, the paper aims to propose a Framework for Measurement that enables the operationalizing of these processes across four observable domains, behavioral, relational, communicative, and cognitive, providing developmentally sensitive lenses for assessing compassion across the 3–18 age span. Together, these models offer a cohesive developmental architecture for understanding how compassion is cultivated within real-world contexts and across diverse cultural settings. The paper concludes by outlining implications for research, educational practice, and public health, arguing that a developmental approach to compassion measurement and training provides critical tools for strengthening prosocial motivation, relational health, and societal resilience.

Keywords: compassion development, child and adolescent development, prosocial behavior, developmental framework, measurement framework

1. Introduction

If we were to say that life has a goal, we might consider this goal is to bring the fullness of our humanity into every corner of our being, not as a fixed destination, but as a journey cultivated

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through skills that deepen connection with self and others as we grow. In doing so, what defines our humanity? We propose that at least one essential aspect lies in compassion.

In this paper, we introduce a developmental model of compassion that spans early childhood (ages 3–6) through adolescence (ages 15–18). The conceptualization underlying the developmental model of compassion is informed by SEE Learning® (Social, Emotional, and Ethical Learning). This is a compassion-based social and emotional learning (SEL) framework implemented across diverse cultural contexts, serving as both a conceptual anchor and an empirical foundation. These age ranges align with the structure of this program, which provides curriculum and generates insights across the following grade-bands: early childhood (3–5), early elementary (5–9), late elementary (9–12), secondary education (middle school or early adolescence ages 12–14 and high school or late adolescence ages 14–18). This focus does not imply that compassion development ends at age 18; rather, it reflects the ages for which empirical observations and programmatic experience are currently available. Indeed, there is growing recognition that significant developmental change, cognitively, socially, and emotionally, continues well into the 20s (Arnett, 2000; Steinberg, 2014).

This paper is organized into three major parts that collectively build a developmental science of compassion. First, we state why a developmental model is needed by identifying limitations in adult-derived compassion frameworks and defining the developmental period of interest. Next, we introduce the developmental architecture of compassion (Figure 1), which consists of a synthesis of four foundational systems (motivational, emotional, relational, and cultural) to illustrate the contexts that shape how compassion unfolds from early childhood through adolescence. Finally, we build on this foundation by presenting the developmental process model (Figure 2). The purpose of this model is to translate context into the six dynamic psychological processes that make up compassion. They consist of awareness, appraisal, motivation for action, action, mental impact, and meaning-making. These characterize what compassion is and how we can conceptualize and operationalize its emergence over time.

Finally, we outline a framework for measurement that operationalizes these processes across development through four observable domains: behavioral, relational, communicative, and cognitive. This provides a practical lens for assessing age-specific expressions of compassion, and the eventual development of benchmarks that might help guide the design of observation and assessment tools. This might also offer support for empirical research across development over diverse cultural and educational contexts.

Building on these insights, we aim to clarify how compassion unfolds across developmental stages and how interventions can be tailored accordingly. In doing this, we consider how developmental knowledge might inform interventions, both design and outcomes. This also addresses key questions, such as: what capacities are developmentally appropriate to target? how do expressions of compassion shift across stages? and what contextual factors shape its emergence and sustainability? These questions are critical not only for advancing intervention science but also for refining the broader field of compassion.

1.1 Clarifying "development": Why we need a distinct developmental compassion model

To understand compassion as a developmental construct, it is essential to clarify what "developmental" means. In this context, we use the term to refer to the period from early childhood (age 3–6) to adolescence (ages 15–18). Development happens across the whole lifespan, but for this paper we focus on these periods. Childhood and adolescence represent periods of rapid and multidimensional development, characterized by accelerated neurobiological maturation, increasing relational complexity, and the emergence of identity formation. Research

demonstrates that these periods involve significant structural and functional reorganization of the brain, including differential development of limbic and prefrontal control systems and the asynchronous maturation of brain–behavioral regulatory networks (Casey et al., 2008; Steinberg, 2005; Yurgelun-Todd, 2007). At the same time, young people experience expanding relational and social-cognitive capacities, marked by growing sophistication in social brain functioning, peer understanding, and interpersonal reasoning (Blakemore, 2008; Pfeifer & Berkman, 2018). Alongside these changes, adolescence is also a critical window for identity development, during which individuals begin to consolidate self-concept, explore roles and values, and establish increasing personality coherence (Branje et al., 2021). Together, these intertwined neurobiological, social, and psychological processes underscore why childhood and adolescence are such consequential periods for understanding the development of compassion and other complex social and emotional capacities.

Although compassion is increasingly recognized as relevant across the lifespan, most models and measures originate in adult frameworks. For instance, Neff's Self-Compassion Scale (2003) was originally created for adults and only later adapted for youth through simplified language and age-appropriate phrasing, while Sprecher and Fehr's Compassionate Love Scale (2005) was first conceptualized in the context of adult romantic relationships before being modified for use with adolescents. These adaptations implicitly assume that the core construct and its expression remain stable across age groups, an assumption that risks overlooking meaningful developmental differences in how compassion emerges, is understood, and is enacted at various stages of childhood and adolescence.

1.2 What is compassion?

Given this critique, what is compassion? Compassion is generally defined as the capacity to recognize suffering and be internally motivated to respond with care and discernment to the best of our ability (Gilbert, 2009; Goetz et al., 2010). Strauss et al. (2016) proposed a comprehensive five-element definition of compassion that goes beyond simple recognition, including understanding the universality of suffering, feeling emotionally connected, tolerating uncomfortable feelings, and being motivated to act. Gu et al. (2020) empirically examined this definition, providing preliminary support for its structure, though noting that the element of tolerating uncomfortable feelings needed further study. What seems clear is that compassion involves recognizing suffering, an internal motivation to act, and an action. It is also clear that compassion is a complex, multidimensional construct requiring further research to fully understand its psychological and biological mechanisms. From this perspective, compassion is not merely a personal virtue or value; it is a developmental capacity that shapes our intrapersonal development and interpersonal engagement in ways that have direct implications for social and systemic wellbeing.

Compassion is a construct that engages psychological mechanisms that are both universal and profoundly shaped by cultural context. This makes it a meaningful focus for population-level intervention (Roeser et al., 2018), as it supports social and emotional capacities fundamental to development, such as empathy, self-compassion, and prosocial motivation, from a developmental perspective. These capacities are scaffolded by deeper abilities such as emotional regulation, perspective-taking, and resilience across settings (Blair, 2002; Diamond, 2013; Zins et al., 2004). If we were to cultivate these intentionally, we could imagine these capacities might extend beyond individual well-being to strengthen relational health, civic engagement, and collective well-being (Seppälä et al., 2017; WHO, 2025). This theory of change reflects a

burgeoning set of inquiries that suggests that compassion may not simply be a personal trait, but a developmental resource that may have relevance across cultures.

1.3 Advancing a developmental epidemiology of compassion for public health

Compassion is increasingly being recognized as a critical social necessity across multiple domains of human interaction (Eccles & Roeser, 2015; Roeser & Pinela, 2014). This includes multiple areas of study across human society. Medical education research and practice have argued that social accountability without compassion is not social accountability (Cheu et al., 2022). There has been acknowledgment of a widespread "compassion deficit" that impacts societal relationships (McMahon et al., 2017). Social policy studies suggest that compassion could address systemic inequities by transforming individual and collective value frameworks (Horsell et al., 2015). Through multiple perspectives, compassion has been framed as a potential mechanism for social change, institutional transformation, and a way of addressing complex human suffering (Wilkinson et al., 2017).

We begin by situating compassion within a developmental epidemiological perspective, one that examines how psychological capacities unfold across time, populations, and contexts, and how these trajectories relate to health and well-being (Costello & Angold, 2015; McLaughlin, 2014; Rutter, 1989). Although developmental epidemiology has traditionally emphasized risk, disorder, and vulnerability, recent work highlights the importance of promotive and prosocial capacities, including compassion, as foundational elements of population-level flourishing (Roeser et al., 2018; Seppälä et al., 2017). Understanding compassion as a developmental phenomenon is therefore essential for advancing evidence-based programming, informing public health initiatives, and supporting real-world systems of care and education.

Within this broader aim, the present paper advances a developmental model that conceptualizes compassion as a dynamic, recursive process shaped by age, context, and experience. Developmental benchmarking and cross-cultural application are key tools for building an epidemiology of compassion that is empirically grounded, developmentally attuned, and scalable across diverse contexts. Three empirical studies illustrate how this approach has been applied to guide measurement design, program implementation, and developmental interpretation. In a scenario-based assessment of adolescents, approaching compassion as a construct consisting of awareness, appraisal, motivation for action, action, mental impact, and meaning-making provided a conceptual foundation for understanding compassion as a relational and context-sensitive process. Vignettes were designed to reflect common adolescent dilemmas involving peer dynamics and moral tension. Responses were analyzed across the six subcategories of compassion that we referred to as gates. This application revealed that intrinsic prosocial motivation (motivation to act) and that ability to tolerate emotional distress were the most consistent predictors of compassionate action, regardless of peer or adult influence. This work highlighted these subcomponents as central targets for cultivation during early adolescence. The model also clarified the importance of relational context in shaping compassionate behavior, underscoring the need to assess compassion not only as an individual disposition but as a socially embedded process (Frazier et al., 2026a).

In another study, we evaluated the impact of compassion training via SEE Learning, on elementary students in the US. The same model of compassion was used to guide our assessment framework—empathic concern (awareness of suffering), perspective-taking (appraisal), intrinsic motivation (motivation), and self-compassion (action). The model provided a scaffold for interpreting observed gains in empathic concern, self-compassion, and perspective-taking, in relation to age-specific developmental expectations (Frazier et al., 2025). This application of the

model helped us frame our assessment approach in a developmentally appropriate way and began to help us understand how the model might eventually be used not only to evaluate program impact, but to anticipate developmental readiness and optimize intervention timing.

In another set of studies, we conducted a cross-cultural comparative analysis of the differential impact of SEE Learning on children in India and the United States, using the same assessment framework. Despite baseline differences in compassion sub-domains, students in both countries demonstrated statistically comparable gains, supporting the argument that compassion may function as a culturally invariant developmental construct when appropriately scaffolded (Frazier, 2026b). The model enabled researchers to interpret these findings not as isolated competencies, but as evidence of shared developmental mechanisms activated through culturally responsive programming.

Taken together, these studies begin to illustrate the ways in which such a model of compassion might act as a tool for operationalizing the construct, guiding intervention design, and interpreting developmental change. Such a model might also enable researchers to track the emergence and distribution of compassion-related capacities across the life course, evaluate interventions based on targeted developmental outcomes within the constituent parts of the model, and begin to help us understand how social and cultural contexts shape these trajectories. Moreover, it may provide a common language for researchers, educators, and public health practitioners to collaborate across disciplines, when aiming to understand such a complex construct.

1.4 Limitations of adult-based compassion frameworks

These studies offer a rudimentary first pass at utilizing a developmentally grounded framework, but they also suffer from the limitations of working with an adult-derived framing. This is true primarily because the available validated measures that we could apply to these studies assume adult capacities. What this means is that adult models have implicitly assumed stability in aspects of the constructs that make up compassion, limiting our ability to understand developmental trajectories. For example, emotional regulation, abstract moral reasoning, and fully formed identity are all capacities that are still emerging in younger populations. As a result, they risk overlooking the developmental processes through which compassion arises, such as emotional mirroring in early childhood, fairness sensitivity in middle childhood, and civic motivation in adolescence. Moreover, adult-centric models tend to conflate compassion with broader SEL constructs, obscuring its unique motivational and ethical dimensions. The Strauss et al. (2016) model has been widely recognized as a major contribution to compassion science because it clarified previously inconsistent definitions by identifying five core components of compassion. Subsequent empirical work has explicitly built upon this framework, using the five-element model to guide scale development, item generation, and factor validation (Gu et al., 2020; van Lotringen et al., 2024).

Recent reviews also highlight the Strauss model as foundational in organizing and evaluating compassion measures, underscoring its central influence on how the field conceptualizes and assesses compassion (Jiang et al., 2023). However, its utility for developmental research is constrained by its static structure. It outlines *what* compassion entails, but not *how* these elements emerge, interact, or evolve across childhood and adolescence. It is also difficult to use because it does not account for the recursive nature of development. From this perspective, development can be understood as a cyclical self-referential process in which each new capacity emerges through and is contingent upon the reorganization of prior experiences. Whether through

Piaget's (1952) cycles of assimilation and accommodation, Vygotsky's (1978) socially mediated transformations within the zone of proximal development, Erikson's (1963) sequential resolution of psychosocial tasks, Bronfenbrenner's (1979) reciprocal influences across nested ecological systems, or the bidirectional organism-context coactions emphasized by Gottlieb (1991) and Lerner (2006), a developmental lens necessitates some kind of feedback. From this perspective, compassionate actions might feed back into growing or developing awareness, hypothetically reshaping appraisal and possibly deepening meaning-making over the course of a lifespan. This potential is why developing an age-sensitive conceptual model requires more than identifying gaps in existing measures; it also requires a clear account of the underlying systems that give rise to compassion across development. Adult-derived models typically isolate motivational, emotional, relational, or cultural aspects of compassion, but rarely integrate them or consider how they change from early childhood through adolescence. Before we can operationalize compassion in developmentally appropriate ways, we must articulate the scientific foundations that anchor it. The next section synthesizes four intersecting systems that make up the biological and psychological foundations of compassion: motivational, emotional, relational, and cultural. Together, these form the scaffolding for our developmental model, and, ultimately, the measurement framework that follows. From these perspectives, compassionate actions might feed back into growing or developing awareness, hypothetically reshaping appraisal and possibly deepening meaning-making over the course of a life span. This potential is why developing a model is useful.

2. Theoretical foundations for a developmental model of compassion

This model integrates motivational, emotional, relational, and cultural dimensions that each hold distinct implications across developmental periods in early life.

2.1 Motivational system perspective (intrapersonal)

Compassion, as a motivational system, integrates emotion, sociality, and development. It involves a benevolent emotional response toward another's suffering, coupled with the motivation to alleviate that suffering and promote well-being. This motivational orientation is deeply rooted in evolutionary processes and supported by neurobiological mechanisms.

2.1.1 Neurobiological underpinnings

Compassion can be understood as a biologically grounded motivational system, shaped by neurochemical processes and neural mechanisms that support prosocial engagement across development (Carter et al., 2017). Among the central components of this system are the neuropeptides oxytocin and vasopressin, which contribute in distinct ways to social cognition, emotional responsiveness, and caregiving behavior from early childhood through adolescence. These peptides influence neural circuits involved in social salience, affiliative bonding, and stress regulation, processes that help foster a sense of safety and interpersonal attunement, both foundational to compassionate responding (Baribeau & Anagnostou, 2015; Rigney et al., 2022). Oxytocin, for example, enhances sensitivity to social distress cues and promotes prosocial motivation through its effects on limbic and prefrontal regions (Kucerova et al., 2023). Vasopressin plays a complementary role in social communication and emotional regulation, with sex-specific influences on social investigation and bonding. Together, these neurochemical

systems form part of the mammalian caregiving architecture and help scaffold compassion as an evolutionarily adaptive response to suffering.

Beyond these mechanisms, compassion engages broader neural networks, including the anterior insula and anterior cingulate cortex, regions associated with emotional salience and empathic concern. It also recruits the mesolimbic dopaminergic system, suggesting that compassionate action is intrinsically rewarding and reinforced through motivation-related pathways (Engen & Singer, 2015; Klimecki et al., 2014). Parasympathetic regulation via the vagus nerve further supports the physiological states necessary for sustained compassionate engagement (Stellar et al., 2015). Taken together, these neurobiological systems position compassion not simply as an emotional reaction, but as a dynamic, evolutionarily conserved motivational architecture, one that drives care-oriented behavior and supports social connection across developmental contexts.

2.1.2 Self-Determination Theory

Self-Determination Theory (SDT) is a psychological framework for conceptualizing compassion as a motivational system because it is rooted in basic psychological needs. According to SDT, the intrinsic drives for autonomy, competence, and relatedness are essential for fostering internalized motivation and prosocial behavior (Ryan & Deci, 2000). Research demonstrates that satisfaction of basic psychological needs fosters internalization of prosocial values and promotes caring, helping, and beneficence-oriented behavior (Martela et al., 2024; Ryan & Deci, 2000; Weinstein & Ryan, 2010). This means that when individuals experience a sense of agency (autonomy), they can perceive effectiveness in their actions (competence), and are able to make meaningful connections with others (relatedness), then they are more likely to engage in compassionate responses that are both self-endorsed and emotionally resonant. When these needs are satisfied, they do more than make compassionate behavior possible; they strengthen its depth, consistency, and authenticity, contributing to what Ryan and Deci (2024) describe as a sustained, self-driven motivation to care for others.

This is further supported by research suggesting that environments that support these psychological needs enhance empathic concern and prosocial motivation (Forner et al., 2020). Thus, SDT helps illuminate how compassion arises not merely from external cues or moral obligation, but from the fulfilment of deeply rooted psychological needs that guide human flourishing and relational attunement.

2.1.3 Compassion as emotion

Compassion is inherently emotive. It arises in response to perceived suffering and motivates action aimed at alleviating that suffering. Emotion theory offers a compelling framework for understanding compassion as a psychological state characterized by subjective experience, physiological arousal, and expressive behavior (Smith & Lazarus, 1990). Building on this, Keltner et al. (2019) identify key features of basic emotions: brief duration, automatic onset, coherence across response systems, and distinct physiological and behavioral signatures. These features are often present in compassionate episodes. While compassion may not meet every criterion for classification as a basic emotion, it shares enough characteristics to be considered an emotion with motivational and regulatory functions. Neuroimaging research further supports this view. Studies have shown that compassion activates brain regions associated with affective salience and prosocial motivation, including the anterior insula and medial prefrontal cortex (Klimecki et al., 2014).

Taken together, these findings support the view that compassion is not merely a moral stance or cognitive appraisal. Rather, it is a dynamic emotional process, one that can be shaped across developmental contexts and expressed through care-oriented action. This emotional framing complements neurobiological and motivational perspectives, reinforcing compassion's role as a developmentally responsive system.

2.2 Relational perspective (interpersonal)

Compassion is fundamentally shaped by relational experiences. Two complementary frameworks, attachment theory and social baseline theory, offer critical insights into how both interpersonal dynamics regulate and cultivate compassionate responses across the lifespan.

2.2.1 Attachment theory

Attachment theory was originally proposed by Bowlby (1973) and later expanded by Ainsworth (1989). This theory suggests that early attachment experiences influence internal working models of self and other. These experiences shape one's sense of safety, trust, and emotional availability later in life. For example, secure attachment is the ideal pattern in human development. This reflects early exposure to a caregiving system that promotes positive prosocial responses to one's own distress and the distress of others (Mikulincer & Shaver, 2010). Individuals with secure attachment histories are more likely to experience empathic concern, offer support, and engage in compassionate acts when they are engaged in adult relationships. Conversely, those with a more dysfunctional attachment style such as insecure attachment may struggle with emotional regulation and relational attunement due to fears of rejection or abandonment (Mikulincer & Shaver, 2017). They may carry these patterns into adult relationships in ways that make successful relationship building a challenge. According to attachment theory, these early patterns of experience act as templates that shape adulthood. They may guide how individuals perceive themselves and others in relationships in ways that influence how they interpret suffering, respond to distress, and navigate interpersonal dynamics. Studies have demonstrated support for these theories, showing that enhancing attachment security dispositionally (stable trait tendency) or situationally (context-driven response) can increase compassionate feelings and altruistic behavior (Mikulincer & Shaver, 2005).

2.2.2 Social Baseline Theory (SBT)

Social baseline theory (Beckes & Coan, 2011) provides a foundational construct for understanding compassion, by articulating the mechanisms through which social awareness and perceived safety shape human behavior. This approach situates the brain as evolutionarily adapted to assume social proximity as the default state. From this perspective, SBT explains how the presence, or imagined presence, of trusted others reduces threat perception. From an evolutionary perspective, this shift reallocates resources toward regulation and prosocial engagement (Coan & Sbarra, 2015). This means that self-regulation processes that support prosocial and compassionate engagement can be conceptualized as socially distributed. Regulation necessary for attunement is not merely an individual act. It occurs under socially mediated conditions that allow for compassionate motivation and behavior to emerge. In this sense, social baseline theory situates compassion within a broader system of interconnectedness, where awareness of others and markers of safety function as underlying mechanisms that sustain relational bonds and prosocial action.

Taken together, attachment theory and social baseline theory provide a lens through which compassion is more than an induvial disposition. It is deeply embedded in relational capacities that are rooted in early caregiving experiences and sustained through ongoing social connection. This necessitates compassion as an emerging capacity grounded in underlying mechanisms of perceived safety and social awareness that link individual regulation to broader systems of interconnectedness.

2.3 Cultural system perspective (systemic)

2.3.1 Cultural systems of violence and caring

Compassion is not only an intrapersonal and interpersonal phenomenon, but also embedded within cultural systems that shape its development, expression, and social meaning. Psychologist Ervin Staub (2003) applied psychological theory to the development of altruism, violence, and reconciliation to cultural and societal contexts in a way that contextualized psychological processes with cultural ones. From this perspective, cultural norms and values play pivotal roles in determining how and if compassion is cultivated or constrained within a given social context. He characterized this through work on cultures of peace versus cultures of violence to illustrate how societal contexts can either promote caring, helping, and reconciliation or foster hostility, exclusion, and indifference to suffering (Staub, 2003). From this perspective, culture can act to fulfill basic psychological needs, such as safety, identity, and efficacy in ways that might promote compassionate behavior, while those that limit these needs may contribute to aggression and moral disengagement.

It is important to qualify that cultural context and systemic impact are often conflated. What this means is that this is an area in need of greater study. In the context of this paper, we can think of societies and cultures as a school environment. Settings where academic achievement is emphasized and attained, without attunement to foundational psychological needs are also places where parallel epidemics of anxiety, depression, and emotional dysregulation among youth occur (Basileo et al., 2024; Chen, 2024; Faye & Sharpe, 2008). This pattern suggests that such neglect is not a moral failing but a developmental and public health deficit, one that calls for systemic responses beyond clinical intervention.

In this context, compassion-based navigation offers a promising approach to psychological needs fulfilment, not as therapy, but as developmentally attuned human engagement. A counter example to the deficit approach is that when relational scaffolding is used, such as within mentorship structures (Rhodes, 2005), culturally responsive pedagogy (Gay, 2018), and prosocial coaching (Jagers et al., 2019), compassion-based navigation centers human connection as a vehicle for growth. In these cultural or systemic contexts, autonomy, identity formation, and emotional regulation through purposeful relational practices are intentionally embedded in everyday systems of care, education, and community. This demonstrates two essential things. There are specific mechanisms or processes within cultural contexts that can promote or inhibit compassionate development and action. This also meaning that there are opportunities for training and skills development within system, social and cultural contexts. By positioning compassion as a relational capacity, this approach affirms its malleability in promoting well-being, resilience, and social cohesion across diverse cultural contexts.

2.3.2 Affect Valuation Theory

Affect Valuation Theory (AVT) offers a useful framework for understanding how cultural differences in emotional preferences shape the development of social responses across childhood.

This framework offers a way of clarifying how emotional ideals influence behavior in culturally specific ways. According to AVT, individuals internalize culturally valued emotional states, referred to as "ideal affect," which guide not only how they want to feel, but also how they behave in social contexts (Tsai, Knutson, & Fung, 2006).

These emotional ideals may or may not influence children's inner motivation to engage with others' suffering. This is an important distinction because this is not about if compassion develops. It is about how culture will shape their interpretation of what compassionate behavior should look like. For example, verbal support, physical proximity, or emotional restraint may each reflect culturally mediated expressions of care. This framing helps disentangle the complexity between internal emotional motivation and external behavioral expression. While children across cultures may share similar intrapersonal experiences of compassion, the way they express that compassion can vary. This means that what compassionate actions look like may differ.

This does not suggest a fundamental difference in prosocial capacity. Rather, it points to culturally shaped differences in how compassion is enacted. Research shows that cultures prioritizing high-arousal positive emotions (e.g., excitement) may discourage engagement with distress, while those valuing low-arousal states (e.g., calm) may foster more reflective or relational forms of care (Koopmann-Holm & Tsai, 2017). These patterns emerge early and intensify during adolescence when individuals are experiencing heightened sensitivity to social norms and emotional regulation demands.

3. The developmental architecture of compassion: A multi-systemic model

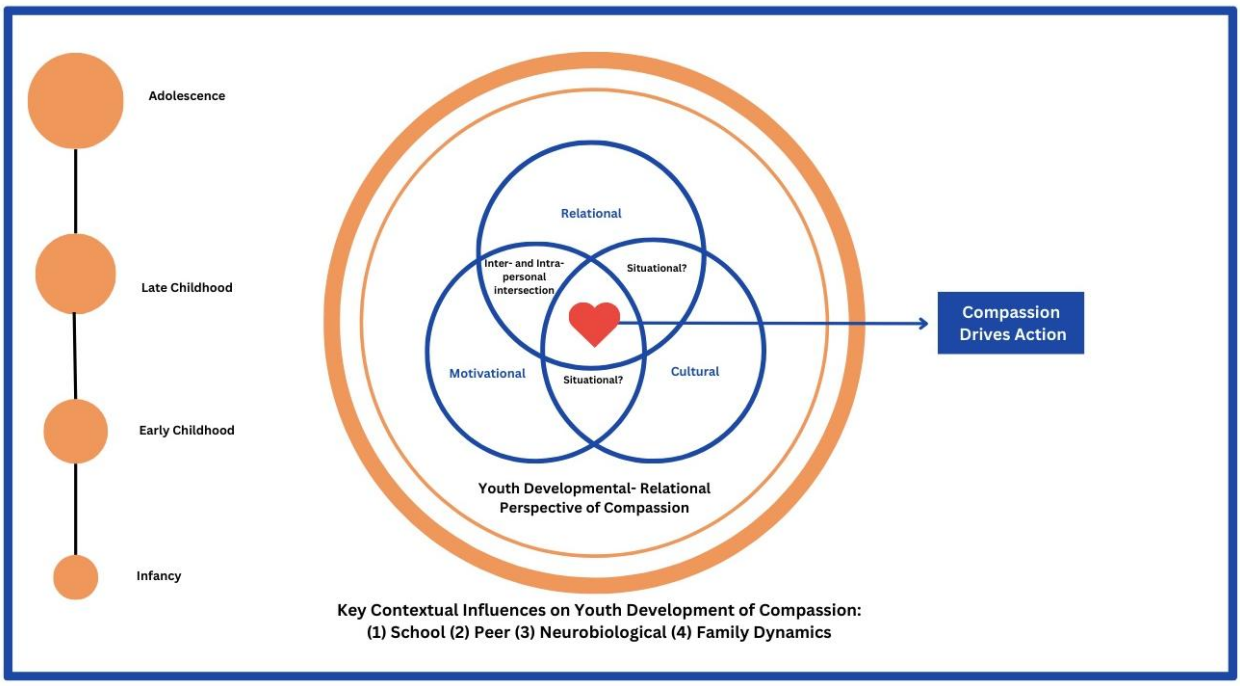

Figure 1. The developmental architecture of compassion. This conceptual model illustrates key contextual influences on the development of compassion across childhood and adolescence.

3.1 Compassion as a construct

Compassion can be understood as a multi-systemic developmental construct, emerging through the dynamic interplay of motivational, relational, and cultural systems. Each of these systems is

shaped by developmental stage and social experience, together influencing how compassion is cultivated and expressed.

3.1.1 Developmental shaping

Compassion develops through a layered structure of development driven by both biological and psychological invariants and ecological influences. While it is complex, it is not impossible. We liken the construct of compassion to three interrelated metaphors—the ocean, the dance, and the garden. The ocean represents intrapersonal development. This is the individual learning to float within the currents of awareness, wisdom, humility, and common humanity. In Booth's poem *First Lesson*, the caregiver holds the child in water, teaching them to trust its support. This image mirrors early development: our individual models of being emerge from experiences of being held in safety. When nurtured, we learn not to cling or flail but to approach suffering with trust in ourselves, in others, and in the environments that sustain us. Over time, this movement shifts from being held to holding, revealing that what appears as individuality is in fact a continuous exchange of care, oscillating between dependence and responsibility.

Development also unfolds through relational interaction, which can be likened to a dance. Growth is a perpetual duet, shaped by the presence or absence of others, by the rhythms of connection and disconnection, and by the ways these experiences leave their imprint. It is within these relational exchanges that change happens, framing who we are and how we act.

Finally, development is nurtured within systems, symbolized by the garden. Families, schools, communities, and cultures act as gardeners, tending to strengths within the system and cultivating environments where compassion can take root and flourish. Skilled gardeners create conditions for meaningful and sustained growth, ensuring that compassion is not only an individual capacity but a collective one.

Current literature supports this framing, showing that compassion develops through the interplay of developmental stage and social experience, with early caregiving scaffolding development such that as capacities within the construct emerge the soil is prepped for compassionate growth. For example, adolescence introducing greater complexity as identity formation and expanding social networks shape its expression (Roeser, Colaianne, & Greenberg, 2018; Bluth et al., 2018; Sultan & Khan, 2025). This is a time when social regulation and relational awareness are still maturing. Underlying these phases is the basic psychological need for autonomy, competence, and relatedness. If these capacities are supported with intention towards compassionate orientation, the environment can support or enhance activation of states that energize compassionate action (Ryan & Deci, 2000). This developmental framing calls for a nuanced understanding that moves beyond traditional motivational models, such as Maslow's hierarchy, which itself was first developed based on the communal values of the Blackfoot Nation (Feigenbaum & Smith, 2020). Rather than unfolding in a linear fashion, compassion likely develops through layered and reciprocal processes that reflect a child's relational environment, cultural context, and evolving emotional and cognitive capacities.

3.1.2 Developmental architecture

In our illustration of the developmental architecture of compassion (Figure 1), these systems intersect across concentric domains of youth development. From infancy through adolescence, these capacities are continuously shaped by contextual influences such as family dynamics, peer relationships, neurobiological maturation, and school environments. The most important idea from this model is that compassion is not confined to a single domain. It arises through situated engagement. It is cultivated within attachment relationships, shaped by culturally valued

emotional norms, reinforced by motivational scaffolding, and expressed through both interpersonal and intrapersonal regulation, helped by systems and cultures that refine and define its presence.

3.2 The case definition of compassion

Given this layered structure, how can we develop a case definition for compassion that is developmentally informed in a way that is useful for epidemiological engagement? Based on this exploration, it is clear that compassion is both a felt experience and a social capacity. It drives action in response to suffering and is modulated by developmental timing and situational context. Drawing from all of the multi-dimensional literatures from emotion theory (Keltner et al., 2019; Smith & Lazarus, 1990), motivational psychology (Ryan & Deci, 2000), attachment theory (Mikulincer & Shaver, 2017), and cultural psychology (Koopmann-Holm & Tsai, 2017), alongside empirical findings from compassion-focused interventions (Frazier, 2026c), we propose the following case definition:

> Compassion, from a developmental perspective, is a multi-systemic construct involving sensitivity to suffering in oneself and others, coupled with a motivation to alleviate that suffering. It is shaped by the convergence of emotional, motivational, relational, and cultural systems, and expressed through developmentally grounded pathways of care.

4. Operationalizing compassion: Domains and psychological processes

4.1 From contextual architecture to operational model

Compassion, understood as a multi-systemic construct involving sensitivity to suffering and motivation to alleviate it, requires not only conceptual clarity via case definition but also practical ways to observe and assess its developmental expression. We began this work by outlining the contextual architecture of the model based on observable psychological and biological processes. We now turn to the question of how this framework can be translated into measurable, developmentally appropriate components, targeting the understanding of compassion as an outcome.

4.2 The process model

This second model (Figure 2) presents a developmental sequence of processes that are directly shaped by and contingent on context (above discussed in Figure 1) in which they are embedded. This provides a foundation for operationalizing compassion. In contrast to the contextual model's focus on foundational mechanisms, the process model considers how intentional practices and developmental training can harness these mechanisms. The goal is to operationalize compassion through observable psychological steps that enable us to view cultivation and measurement across childhood and adolescence.

Another critical aspect of this approach is to address both the linear and the cyclical nature of development, while removing the assumptions of isolation or reduction of compassion to single stable unit. For example, a child's helping behavior may influence future emotional regulation, relational attunement, and ethical reasoning, forming a feedback loop that reinforces compassionate capacity. The purpose of the model is to create a tool that might be used to help researchers address this example as a question—is this true? And if it is true, when and what factors contribute to this reinforcement?

Based on our case definition of compassion, the proposed model is structured as "typical" steps in a compassionate act beginning with noticing or becoming aware of suffering. Prosocial behavior requires a sensitivity to the needs of others. Underlaying this noticing is perspective taking and empathic concern. Longitudinal studies have demonstrated this relationship between prosociality and empathic concern in the context of relational sensitivity (Carlo et al., 2015). This is followed by appraising or interpreting the situation. In this model, we propose that distress tolerance is a component of appraisal because it is the ability to endure and regulate uncomfortable emotions without avoidance or collapse. This is what allows individuals to remain engaged rather than withdraw. Drawing again from research on prosocial behavior, evidence suggests that prosocial behavior and emotional regulation are bidirectionally linked such that children who help others and can share also have stronger self-regulation skills. Conversely, children with better self-regulation have demonstrated greater likelihood to act in prosocial ways (Eisenberg et al., 2015). These observations highlight distress tolerance as a regulatory capacity central to prosocial action. In the current model, prosocial compassionate action originates in the individual's motivating intention or goal for how to respond. This, in turn, leads to compassionate action.

Motivational drive to act compassionately, over time, fosters relational attunement which in turn strengthens empathic concern (Carlo et al., 2015). This observation sets up a feedback loop during early development. Within the moral development literature, repeated compassionate acts contribute to identity formation around responsibility and justice (Colby & Damon, 1992). Compassion is not an isolated action. It can signal moral identity over time. Framing children's helping behavior within feedback loops highlights how prosocial action can initiate developmental cascades that reinforce emotional regulation, relational attunement, and ethical reasoning.

What this means is that compassionate actions have outcomes that affect the self, the targets of the action, and those who might be observers of the action. Development, as an iterative process, acts on itself in ways that allow for developmentally appropriate reflection and interpretation to influence the evolution of the self-concept. Because of this, we include meaning-making and identity formation as critical to the compassion model. We propose that compassionate actions have an impact and this impact will feed into meaning-making in a way that consolidates compassion as a developmental process. We can turn to developmental systems theory which highlights how iterative reflection can support "developmental cascades," such that small acts accumulate into broader competencies. This can include resilience, social competence, and moral identity. Through this lens, acts of compassion can become developmental experiences that impact identity in ways that transform individual acts into long-term ways of being with one's self and others. This is meaning-making. We propose the integration of impact and meaning-making gates as critical aspects that more directly reflect developmental processes, and thus directly orient the operation of the case definition of compassion as developmentally embedded.

4.3 Integration and application

Together, the contextual model (Figure 1) and the process model (Figure 2) provide a dynamic, developmentally sensitive pathway for understanding how compassion emerges and deepens over time. The contextual model situates compassion within the underlying biological and psychological mechanisms fundamental to our humanity. We propose the process model as a demonstration of how we can observe the impact of training and intentional practices to harness the contextual mechanisms to cultivate compassion. This model also provides measurable

indicators of the developmental expression of compassion. Our goal is to provide a layered framing that supports both theory and application designed for observing and measuring compassion across developmental stages and ensuring that age-specific expressions are captured in research and practice.

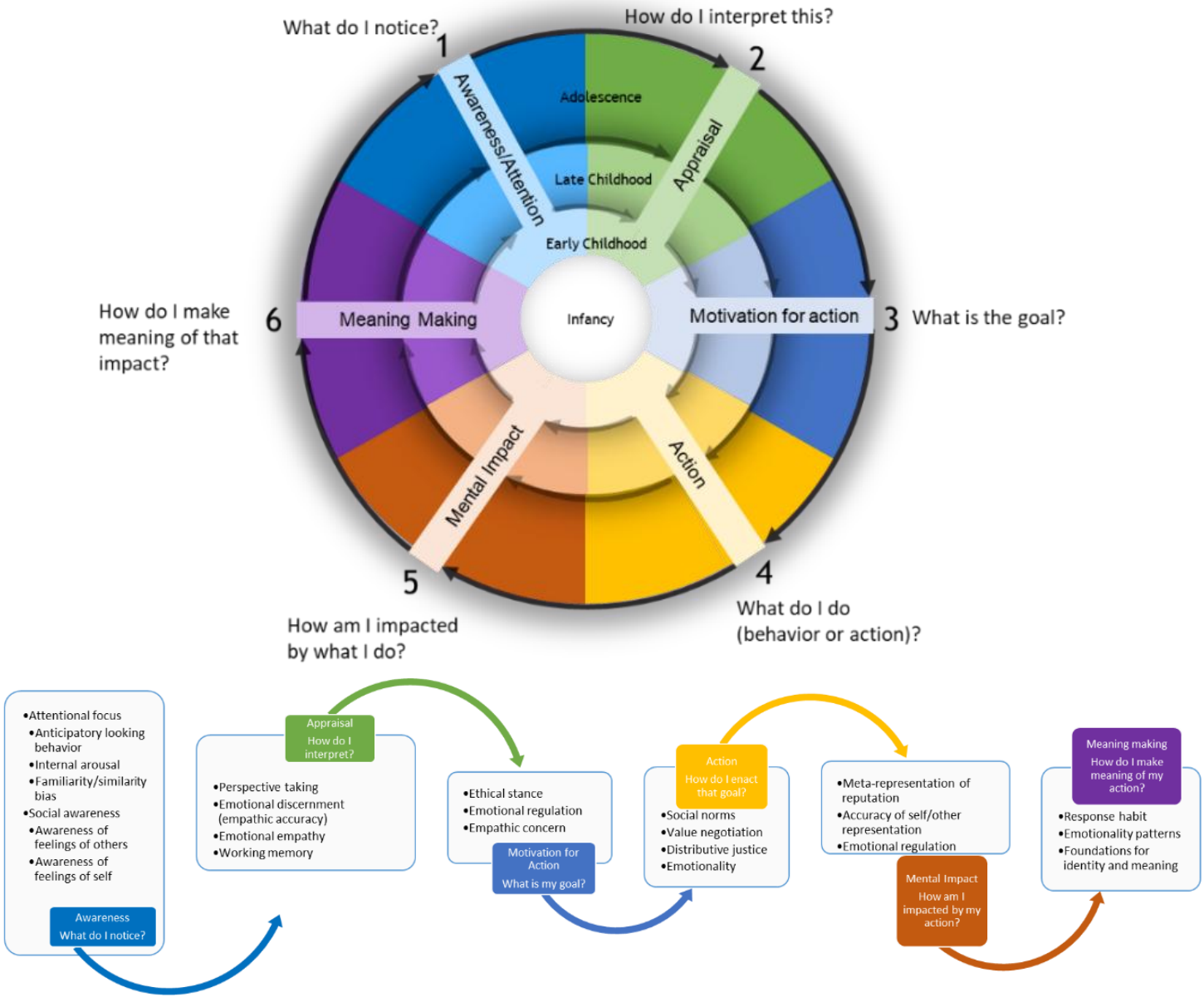

Figure 2. The developmental process model of compassion. The diagram presents a developmental process model of compassion, tracing key psychological processes—awareness, appraisal, motivation, action, and meaning-making—across early childhood, late childhood, and adolescence. Rather than depicting a linear trajectory, it highlights the recursive nature of development, illustrating how compassionate responses emerge and shift through ongoing interactions among cognitive, emotional, and relational systems. This model also offers a practical lens for observing and measuring compassion, using four domains, behavioral, relational, communicative, and cognitive, as entry points into its layered expression.

5. Developmental trajectories and outcomes

Age-specific compassion-based capacities, such as emotional attunement, fairness sensitivity, and moral reasoning, unfold in distinct ways as children mature (Killen & Rutland, 2011; Spinrad & Eisenberg, 2019). For example, younger children often demonstrate compassion through concrete helping behaviors, while older students engage in more reflection and peer-based inquiry around ethics and justice. Both of these examples also reflect developmental markers. Sharing behaviors are a sign of normal prosocial progression, as is the exploration of fairness and justice. These variations underscore that compassion is not peripheral to development but central to how children and adolescents learn to navigate relationships, regulate emotions, and engage ethically with the world. Explicit understanding of this can enable more intentional targeting of compassion-based skills and capacities. The purpose of this section is to illustrate social and emotional needs from a compassion lens, across age-bands. In each case, the environment, whether caregivers, peers, or broader social contexts, plays a critical role in shaping growth. How these environments respond to children's needs determines whether compassionate capacities are nurtured, scaffolded, or constrained. By situating compassion within developmental trajectories, we highlight both the opportunities and challenges of fostering compassion across the lifespan and within diverse cultural contexts.

5.1 Social and emotional needs across development

Children grow in patterned ways. What they can do and what they need shifts as the body, brain and psychological capacities mature. These predictable changes guide the unfolding of skills and capacities over time. How can we view compassion through this lens? Unlike motor or language milestones, compassion does not have concrete benchmarks that we know of. What we do know is that it does emerge dynamically through the interplay of social, emotional, behavioral and cognitive growth. In this section, we aim to align known developmental factors with social and emotional needs in order to trace how these evolving capacities might create opportunities for acting with care and compassion. By doing this, we hope to frame compassion as a malleable process that matures with the child and is shaped by both inner development and outer relational experiences.

For our purposes we define early childhood as approximately ages 3–6, aligning with preschool age-bands. We also acknowledge that there are many frameworks that vary in how this developmental period is segmented. During this window, emotional security and relational trust take shape. These conditions lay the groundwork for prosocial development. This is a time when children learn emotion recognition and regulation through responsive caregiving, emotional mirroring and guided social interaction. What is needed are predictable routines and consistent co-regulation patterns that can be used to provide the necessary scaffolding for emergent capacities such as self-regulation and executive function to develop. Play is critical because this is where children can "practice" perspective taking and rule learning (fairness, taking turns) in low-stakes and safe ways. Children actively practice modeled prosocial behaviors, such as cooperation and conflict resolution during play and during daily interactions. When secure relationships are fostered with caregivers, prosocial motivation capacities and complementary work on emotion regulation can support the development of greater empathic concern (Bowlby, 1973; Mikulincer & Shaver, 2017; Niven & López-Pérez, 2025). Together, language for emotions and relational repair, consistent and safe caregiving, and play-based social learning form the foundations for building relational and emotional capacities that support compassionate responding can support the development of greater empathic concern. Together, language for emotions and relational repair, consistent and safe caregiving, and play-based social

learning form the foundations for building relational and emotional capacities that support compassionate responding (see Table 1).

Table 1. Early childhood (ages 3–6)

Developmental focus	**Social and emotional needs**
• Establishing emotional security through attachment • Learning to identify and regulate basic emotions • Building trust and relational safety • Early perspective-taking and rule learning (simple fairness, turn-taking) • Foundations of self-regulation and executive function (inhibition, attention)	• Responsive caregiving and emotional mirroring • Guided social interaction and modeling of prosocial behavior • Language for emotions and relational repair • Play-based opportunities for practicing cooperation and conflict resolution • Predictable routines and co-regulation strategies (e.g., calming, labeling feelings)

We define middle childhood as the ages 6–9. This period of development is a pivotal time for social and emotional development. It may also be a pivotal time when compassion-related capacities might be enhanced. Children are beginning to internalize social expectations and deepen their engagement with peers. In the classroom, structured routines, cooperative tasks, inclusive group work, and guided conflict resolution opportunities create the opportunity to practice and enhance perspective taking and relational attunement. Teachers and caregivers can reinforce compassionate actions by explicitly recognizing and reinforcing help, sharing, and acts of support. These positive opportunities for practice and recognition may strengthen the stability of prosocial interactions. Empirical work has demonstrated that prosocial acts are intrinsically rewarding and, when modeled, practiced, and acknowledged, (Bluth et al., 2018; Hepach et al., 2013; Sultan & Khan, 2025) they may contribute to compassion as a burgeoning component of identity formation. In this way, social context has a powerful impact on ethical engagement during middle childhood (Killen & Rutland, 2011; Eisenberg et al., 2015) (see Table 2).

Table 2. Middle childhood (ages 6–9)

Developmental focus	**Social and emotional needs**
• Expanding peer relationships and group belonging • Developing fairness sensitivity and empathy • Internalizing social norms and moral rules	• Cooperative tasks and inclusive environments • Inclusive classroom norms and rituals • Opportunities for conflict resolution and perspective-taking • Recognition and reinforcement of prosocial efforts

Late childhood is defined as ages 9–11. This period is marked at a time when children consolidate emotional regulation skills and deepen moral reasoning. More and more they are able to utilize cognitive reappraisal, problem-solving, and self-directed calming (Perry, 2019) to respond to another's distress that is sensitive to context and attunement to need. This is also a period when children shift strongly towards concerns for fairness, reciprocity, and ethical appraisal. This along

with the capacity to integrate sympathy and justice into prosocial motivation (Kohlberg, 1984; Nucci & Turiel, 2009) makes this period a potentially critical window for compassionate development. For example, a 10-year-old who invites a peer who seems left out into a group activity is acting from internalized values, rather than external prompts. The act of fairness and inclusion overcome the fear of potential peer disapproval (Eisenberg, et al., 2015; Killen & Rutland, 2011; Malti & Krettenauer, 2013; Nucci & Turiel, 2009). Opportunities to cultivate this compassionate response in the face of peer judgment through classroom practices and teacher responses help this age group stabilize their capacities for empathic concern and intrinsic prosocial motivation to alleviate suffering. This potential is worth further study within this age group (see Table 3).

Table 3. Late childhood (ages 9–11)

Developmental focus	**Social and emotional needs**
• Strengthening emotional regulation and moral reasoning • Navigating complex social hierarchies • Forming a sense of ethical responsibility	• Safe spaces for ethical reflection and dialogue • Support for autonomous prosocial decision-making • Feedback loops that reinforce compassionate behavior

Early adolescence runs between ages 11–14 (see Table 4). This period in development is marked by an integration of moral identity into increasingly sophisticated abstract moral reasoning and civic awareness (Malti et al., 2021; Moshman, 2011). Adolescents are beginning to seek opportunities for purposeful contributions. They begin to frame concerns about fairness and justice in broader ways. They also have an expanded capacity for extending concern to "abstract others," those beyond their immediate peer or family circles (Damon, 2008). Increased empathy and enhanced self-regulation capacities may support actions that are both emotionally grounded and cognitively ethical (Eisenberg et al., 2015, 2014; Steindl et al., 2021). In the classroom, educators can scaffold this cognitive maturity with hypothetical reasoning opportunities such as critical inquiry and civic projects that help students deepen these expanding capacities (Moshman, 2009).

Table 4. Adolescence (ages 11–14)

Developmental Focus	**Social and Emotional Needs**
• Integrating moral identity and civic awareness • Exploring systemic issues and abstract others • Building agency and social responsibility	• Opportunities for meaningful contribution and advocacy • Validation of values-based action • Structured exposure to diverse perspectives and systems thinking • Guided critical reflection • Peer and adult mentorship in compassionate leadership • Safe spaces for ethical risk-taking

This is a time when youth will inevitably encounter peer hierarchies and social inequalities. This is also a time when they can take their expansion of compassion towards abstract others and

translate that into advocacy both within and beyond their peer groups, if they are properly supported (HHS Office of Population Affairs, 2023; Killen & Rutland, 2011). For example, the positive youth development framework has demonstrated that high quality mentoring relationships and structured contribution opportunities foster agency, social responsibility, and an integrated sense of competence, character, and caring (Lerner, Dowling, & Anderson, 2003; Rhodes, 2002). Furthermore, combining action with reflection, rather than reflection alone, more reliably strengthens moral identity and sustained prosocial engagement (Roeser et al., 2018). If this action is viewed through a compassionate framework, then this approach could further strengthen compassionate outcomes. Quality mentoring relationships and structured contribution opportunities foster agency, social responsibility, and an integrated sense of competence, character, and caring (Lerner, Dowling, & Anderson, 2003; Rhodes, 2005).

5.2 Compassion components as foundations for positive development

Given this articulation of the developmental focus, as well as social and emotional needs across development, we can now build our understanding of the ways in which the subdomains of compassion align with social and emotional needs across childhood and adolescence. This section outlines the six core components of compassion: awareness/attention, appraisal, motivation for action, action, mental impact, and meaning-making, as emergent developmental trajectories.

5.2.1 Awareness/attention

The first gate in a compassionate action is the awareness of another's emotions and needs. This capacity unfolds developmentally from early childhood to adolescence. In early childhood awareness begins with attentional orientation to distress. This may be expressed as emotional mirroring and proximity-seeking. For example, infants orient towards caregivers who show signs of distress. This sensitivity and responsiveness are shaped by secure attachment and responsive caregiving (Bowlby, 1973; Stern & Cassidy, 2018).

In middle childhood, children begin to notice when peers are excluded, monitor group dynamics, and engage in turn-taking. This shift signals an expanded attentional focus towards fairness and inclusion (Killen & Rutland, 2011). Awareness at this stage moves beyond emotional recognition towards social positioning. This shift reflects the emerging integration of more sensitivity as a component of compassion-based perception and awareness.

Late childhood shows more enhanced capacity to detect subtle emotional shifts and to anticipate social consequences. This age group is capable of articulating concerns or anticipating outcomes and adjusting behaviors, demonstrating a greater capacity to foresee the impact of another's actions. This is called anticipatory awareness and reflects an even deeper integration of emotional recognition with moral reasoning. It also is the foundation for fostering autonomous prosocial choice making.

In adolescence, youth begin to gain awareness of the abstract other, beyond their peer group. This abstraction extends their ability to increase concern towards broader issues of injustice, equity and inclusion, reflecting their growing capacity for systemic compassion (Roeser et al., 2018). At this stage, awareness can now encompass both interpersonal and civic systemic domains. This shift is observable in adolescents' attention to social issues, advocacy for marginalized groups, and principled discussions of fairness.

Awareness becomes observable in who and what youth pay attention to, how they respond in relationships, and their depth of emotional recognition. Awareness matures into multi-dimensional capacities that act as the initial anchor towards compassionate engagement throughout the lifespan.

5.2.2 Appraisal

Appraisal is the ability to interpret the emotions of others. This sub-domain is a core component of compassion that develops with increasing complexity across childhood and adolescence. In early childhood, children rely on caregivers to determine if a situation calls for concern. This includes simple emotional language to interpret intent. For example, "He's sad because she took his toy" reflects early causal links between action and emotion. This marks the foundations for compassion appraisal.

In middle childhood, children begin to evaluate social situations through fairness and intent. This is a time when peer conflict resolution and cooperative play facilitate skills development given the child's more deliberate ability to evaluate social situations. They have the ability to monitor motives and link them to outcomes. Phrases such as "that's not fair" suggest that moral reasoning is emerging. They can connect emotional states with underlying causes (Nucci & Turiel, 2009).

Late childhood comes with greater capacity to grapple with ethical dilemmas. Children can weigh multiple perspectives and anticipate relational consequences. This provides an opportunity for deeper integration of compassion into cognitive and relational skills.

Following this, adolescence further deepens appraisal capacity towards systemic levels. They are able to articulate complex interpretations of social issues and connect moral reasoning to broader civic concerns (Malti et al., 2021). At this stage, appraisal expands to include structural or systemic issues of injustice. This encompasses an ability for advocacy at both the interpersonal (peers) and systemic (abstract other) level. They can choose to challenge exclusion and, with support, can act regardless of anticipated social challenges.

Over the course of these stages, how youth make sense of another's experience will explain their motivations and justifications for their actions. Appraisal evolves from affective interpretation to fairness logic to contextual reasoning and systemic critique by adolescence. This trajectory shows how appraisal matures through both interpersonal and social or systemic domains.

5.2.3 Motivation for action

Motivation for action begins in early childhood with spontaneous gestures. Toddlers often respond to distress by imitating adults, offering a toy, reaching out or calling for help. These actions reflect a burgeoning moral impulse. This means that compassion is more reactive at this stage and tied directly to immediate comfort (Hepach et al., 2013).

By middle childhood, helping behavior emerges through the impetus for fairness and peer norms. Cooperative tasks, inclusive play, and quiet acts of care demonstrate how children begin to align their actions with group values and growing social awareness. Motivation at this stage reflects internalization of norms within the environment. Children go beyond soothing distress towards a focus on upholding fairness and belonging (Eisenberg et al., 2015).

Late childhood comes with greater self-directed actions driven by internalized values. This may include youth resisting peer pressure in order to do what is right even if it is unpopular, but this requires context support. Opportunities for leadership roles, conflict mediation skills development, and verbal reasoning about moral choices support this shift towards autonomy with intentions about moral choices (Cirimele et al., 2024).

In adolescence, motivation expands to include identity and civic purpose. This means that teens have a desire to contribute meaningfully beyond immediate circles into their broader community. Advocacy, mentoring, and sustained service commitments are ways of linking the developmental focus on prosocial action with more identity formation. This provides an

opportunity for more compassionate identity formation. Anchoring moral identity in compassionate values deepens development to extend beyond interpersonal contexts (Carlo et al., 2015).

The developmental articulation of motivation evolves from reactive comfort-seeking to identity-driven civic engagement. This trajectory demonstrates how motivation can mature into a potentially durable capacity that is anchored in the internalization of values to sustain compassionate behaviors.

5.2.4 Action

Compassionate action is the culminating outcome that may represent a shift from imitative gestures to value-driven commitments. In early childhood, children engage in social modeling such as offering a toy to comfort a peer or alert an adult when someone is upset. These behaviors demonstrate social modeling and illustrate the child's growing understanding of social norms and emotional consequences (Eisenberg et al., 2015). At this stage, compassionate acts are more reactive and imitative.

By middle childhood, actions become more organized and cooperative. Children can choose to engage in peer support, conflict resolution, and inclusive play. They begin to stem into mediating disagreements. They might assert that others should be included (Eisenberg et al., 2015) even if against peer norms.

By late childhood, there is even greater intentional relational engagement. Youth can advocate for fairness and take a leadership role in initiating group repair. Their actions become more deliberate and grounded in a desire to maintain group harmony by upholding values of justice and inclusion (Gu et al., 2020).

In adolescence, action is deeply linked to identity-based expression. For example, teens interest in mentoring younger peers, participating in advocacy, and engaging in service projects reflects their emerging moral framing. These actions are directly tied to their moral identity. It is also linked to systemic awareness. This awareness can be made visible through organized activities, reflective dialogue, and relational leadership roles (Roeser & Pinela, 2014).

Across development compassionate action is what youth choose to do and how they choose to do it. It is the spontaneity, coordination, reflection and ethical reasoning that guides how one might act. This action evolves from imitation to identity-anchored action. This extension from interpersonal care to civic engagement articulates how we might understand compassionate action.

5.2.5 Mental impact (emergent)

This domain is emergent because we are proposing this extension of the model. In early childhood, mental impact would be minimal but might be observable in empathic resonance. For example, very young children show distress when others are upset or pride after helping. They also often seek reassurance—"did I do something bad?" or "she is still sad?" These questions highlight the emerging self-other differentiation. This differentiation in the context of caregiver attachment shapes how children develop emotional regulation (Stern & Cassidy, 2018).

In middle childhood, children being to ruminate on social missteps, worry about peer feedback, and seek validation for prosocial acts. They carry a growing sensitivity to social consequences and are attuned to reputation in shaping compassionate behavior (Sultan & Khan, 2025). In this context, how compassionate actions are perceived and affirmed may impact if they engage that action again.

By late childhood, children might grapple more deeply with ethical questions. They might withdraw after a conflict, express unease in response to an interaction, or address fairness and responsibility on reflection of an experience. Children are beginning to reflect crucially on their own choices and the implications of those choices (Malti & Krettenauer, 2013).

In adolescence, complex moral emotional and systemic reflection are the foundations for layered emotional experiences. Feelings of guilt, pride, and moral tension are more pronounced. These impacts can be observed through verbal reflections on values and responsibility, regulation strategies, and relational shifts (Sultan & Khan, 2025).

Impact is really about how young people process their actions, regulate emotional consequences, and strive to attain alignment between their behaviors and values. This begins with emotional resonance, identity-anchored moral emotions, that may shape the inner landscape of self-awareness regulation and ethical integration.

5.2.6 Meaning-making (emergent)

Meaning-making is another emergent domain that we are proposing. In very young children, meaning-making begins through simple narrative that links actions to feelings and relational outcomes. For example, "I helped because he was sad," starts to create connections between actions and feelings. These types of linkages can be embedded in storytelling, play themes, and basic explanations through interactions with caregivers. These are shaped by feedback from adults who also offer emotional scaffolding. This reflects the initial integration of experience and identity.

In middle childhood, meaning becomes more tied to social participation and belonging. Children begin to connect prosocial behavior and the need to maintain harmony and fairness within their peer group (Killen & Rutland, 2011).

In late childhood, meaning-making is emerging just as self-understanding and ethical orientation is emerging. Youth might begin internal questioning when prompted about why compassion matters and what this might reveal about them.

In adolescence, meaning-making becomes much more central to identity formation. Compassionate experiences are integrated into personal values and civic purpose. Adolescents may articulate how their values are reflected in their actions. This type of reflection might support further integration of compassion into self-identity and the integration of social responsibility (Kroger, 2007; Damon, 2008).

Across developmental stages, meaning-making shifts from narrative labeling to identity-defining and purposeful reflection. This trajectory demonstrates how compassionate meaning might mature into personal identity.

5.2.7 Ways of seeing compassion subdomains

Ways of observing these compassion subdomains include what children might do (behavioral), how children might relate to each other (relational), what children might say (communication), and how children are thinking (cognition). These lenses offer practical approaches through which compassion might be seen. These do not function as separate systems of observation, but they do provide distinct vantage points through which we can begin to understand compassion and how its subdomains manifest across development.

Behavioral Domain. Compassion is visible in observable acts of care and support. This includes helping, sharing, peer assistance, and constructive conflict resolution. Behavioral indicators show how awareness, appraisal, motivation, and action translate into tangible practices that can be observed in everyday interactions.

Relational Domain. Compassion is expressed through the capacity to form and sustain empathic, trusting, and secure connections with others. Grounded in sensitivity to others' needs and perspectives, the relational domain highlights how compassion is embedded in attachment, belonging, and the quality of social bonds.

Communicative Domain. Compassion is articulated through spoken, written, and nonverbal expressions that convey concern, validation, and reflective understanding. This domain emphasizes how meaning-making and mental impact are shared and interpreted, whether through dialogue, storytelling, gestures, or reflective discourse.

Cognitive Domain. Compassion is shaped by ethical reasoning and perspective taking. This includes awareness of fairness, justice, kindness, and the interdependence of human experience. The cognitive domain illuminates how appraisal and meaning-making deepen into moral reflection, systemic awareness, and principled commitments.

5.3 Developmental map of compassion

This developmental map illustrates how core components of compassion, awareness/attention, appraisal, motivation for action, and action unfold across childhood and adolescence. Each stage reflects age-specific capacities shaped by emotional, relational, and cognitive growth, offering insight into how compassion becomes increasingly intentional, context-sensitive, and ethically grounded over time. By tracing these trajectories, the map provides a foundation for observing and measuring compassion through developmentally appropriate behaviors, interactions, and reasoning. The following table offers selected examples of how core compassion components, awareness/attention, appraisal, motivation for action, and action align with developmental stages from early childhood through adolescence. These examples are not exhaustive but serve to illustrate how compassion-related processes emerge and evolve in tandem with age-specific social, emotional, and cognitive capacities (Table 5).

Table 5. Developmental stages and compassion alignment

Developmental stage	Awareness/attention	Appraisal	Motivation for action	Action
Early childhood	Emotion mirroring; proximity-seeking	Affective interpretation of distress	Reactive comfort-seeking	Imitative gestures (e.g., offering toys)
Middle childhood	Fairness sensitivity; peer inclusion	Intent recognition; fairness logic	Internalized prosocial values	Cooperative play; peer support
Late childhood	Emotional nuance; social anticipation	Perspective-taking; contextual reasoning	Moral responsibility; autonomous motivation	Inclusive leadership; conflict resolution
Adolescence	Systemic awareness; abstract others	Ethical reflection; social critique	Identity-based agency; civic motivation	Advocacy; service projects; mentoring

6. Expanding the model: Impact and meaning-making

The developmental map of compassion offers a scaffold for tracing how core components, awareness, appraisal, motivation for action, and action, take shape and evolve from early childhood through adolescence. It reflects well-established progressions, from emotional mirroring in young children to moral reasoning and civic engagement in teens (Killen & Rutland, 2011; Spinrad & Eisenberg, 2019). These patterns align with foundational developmental theories, including Piaget's cognitive stages (Inhelder & Piaget, 2013), Erikson's psychosocial tasks (Erikson, 1968), and Kohlberg's framework for moral reasoning (Kohlberg, 1984).

Still, the linear structure of most models, while helpful, doesn't fully capture the recursive and transformative nature of compassion. What is often missing is the internal impact or how compassionate action shapes the self. Development is not just about what children do; it is also about how those actions influence their values, sense of identity, and understanding of others. Research on moral identity formation and self-reflection suggests that children and adolescents are not simply acting compassionately, they are making meaning of those actions, weaving them into their evolving worldview (Damon, 1984).

This reflective process is closely tied to metacognition, the ability to think about one's own thinking. As metacognitive skills mature, especially in adolescence, youth become more capable of evaluating their motivations and deriving personal significance from their behavior (Flavell, 1979; Kuhn, 2000). Meaning-making is a higher-order cognitive function with early roots, but it becomes more fully formed as self-awareness and abstract reasoning develop. To reflect this deeper arc, we propose expanding the model to include two additional components:

- **Impact**: The immediate emotional and cognitive consequences of compassionate action, including both the alleviation of suffering and the potential for unintended outcomes. Impact provides the experiential material that shapes how individuals feel, think, and interpret their compassionate engagement.
- **Meaning-making**: The reflective process through which those emotional and cognitive consequences are integrated into one's evolving identity and developmental narrative. Meaning-making transforms compassionate acts into identity-shaping events, contributing to broader commitments around responsibility, belonging, and moral growth.

These additions recognize that compassion is not only relational and behavioral; it is also deeply intrapersonal and transformative. It is worth noting that impact and meaning-making remain understudied. Our work aims to explore their developmental nuance and map them onto a broader framework of social and emotional growth through a compassion lens. This integrative approach draws from neuroscience, developmental psychology, cultural studies, and public health. It reframes compassion not as a soft or sentimental ideal, but as a vital, measurable force that supports human flourishing across the life course. Compassion is biologically rooted, culturally shaped, and socially expressed. It begins with attachment, unfolds through relational behavior, and responds to context (Roeser et al., 2018; Spinrad & Eisenberg, 2019). Crucially, it also operates within the self, leaving emotional and cognitive imprints that guide future action and deepen ethical engagement.

7. Conclusion: Toward lifespan-sensitive compassion science

A developmental model of compassion advances an epidemiology of compassion, one that weaves together the ocean of intrapersonal growth, the dance of relational exchange, and the garden of systemic care. By grounding compassion in recursive, multi-domain processes, this

framework integrates psychological development with population level inquiry and expands the scope of developmental science to include promotive, prosocial capacities. As compassion gains recognition as a vital resource for individual and collective flourishing, this model offers both a scaffold for measurement and a vision for cultivation, tracing how compassion deepens, diversifies, and becomes woven into identity across the life course and within diverse cultural contexts. In positioning compassion as both a measurable construct and a transformative human capacity, this work contributes to a lifespan sensitive science of compassion, one that honors developmental nuance, cultural diversity, and the ethical imperative to foster care and connection at every stage of life.

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The authors declare no conflicts of interest related to this work.

AI statement

No AI was used to generate, analyze or interpret data. All content and conclusions are the authors' own.

Ethics statement

This manuscript is a theoretical and integrative review paper and does not involve the collection of new empirical data from human participants. All empirical studies referenced in this article were previously published and, as reported by their original authors, conducted in accordance with established ethical standards, including appropriate informed consent procedures and institutional ethical approvals. Because no new data were gathered for the present work, additional ethical approval or consent was not required. This paper adheres to the ethical principles of scholarly integrity, proper citation, and accurate representation of prior research as outlined by established academic and professional guidelines (e.g., institutional, national, and international standards for ethical scholarship).

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