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Developmental pathways and Intersections among Domains of Development

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Introduction

Conceptual Framework for the Intersections of Domains

The defining feature of development is the emergence of new forms – “development” is the property of change, and change is no more rapid than in early childhood. As a result of both its speed and complexity, the study of early development has often moved forward through concentration on specific domains. Domain specific focus as well as issues of discontinuity and individual variation complicate the process of mapping developmental pathways in early childhood. Concepts of development have historically favored linear progressions that oversimplify and tend to homogenize development (Fischer, Ayoub, Singh, Noam, Maraganore, & Raya, 1997; Piaget, 1983; Freud, 1933,1965; Kohlberg, 1969). In contrast to these linear models, we propose that a person develops along a web of multiple strands and that different people develop along different pathways or webs. At the same time, different people's webs can be similar, or they can be very different. The focus of this chapter is on the differences between webs as well as the processes by which strands separate and integrate within a web.

Secondly, the study of development has increasingly moved toward the fragmentation or splitting of the human organism into ‘investigatable’ units or domains – biology, behavior, culture, genetics, cognition, relationships, innate modules of mind, etcetera – resulting in the inevitable loss of the *person* as an integrated, embodied center of agency and action (Fischer & Biddell, 1998; Lerner, Anderson, Balsano, Dowling, & Bobek, 2003; Overton, 2003). Though researchers acknowledge that development occurs across multiple integrated biological and behavioral levels (Susman, 1998), most

scientific knowledge is generated and interpreted within distinct disciplinary boundaries, making our understanding of the person *as a whole* opaque.

Domain-specific exploration, although critically important to the advancement of scientific understanding, has the continued potential to isolate processes that occur simultaneously within the child. As a response to this fragmentation, a number of theorists have begun to think across domains, placing the young child's various developmental processes in context over time. For example, the notion of cognition and emotion as a set of dynamic and integrated systems is becoming a new powerful theory that bridges psychological and neurobiological conceptions of both thinking and feeling (Fischer & Biddell, 1998). Add to this equation the development of critical communication, motivational, and self-regulation skills and the transformations in the "whole child" during the first five years of life are the most extraordinary across the life span.

We will use the examples of the alternate developmental pathways for shy, autistic, and maltreated children to highlight the importance of examining the intersections of domains from a developmental perspective. Assumptions about the child's cognitive, language or social development, made in the absence of context and without attention to domain intersections, can lead to the erroneous belief that the child, for example, has a cognitive delay rather than an adaptive difference. The practical result is often that the assumed cognitive delay is addressed without acknowledgement of the child's actions as adaptive and developmentally maturing responses to an adversarial condition or environment.

Using an integrative pathways approach results in understanding the behavior of young children as adaptive and complex rather than simply delayed or dysfunctional. It is our perspective that the simplistic mischaracterization of delay in each group of “different” children we describe stems from the persistent view that development occurs in a domain general and unidirectional way, regardless of context. This field is ready to accurately describe the variation in children’s development with a “child in context” framework that emphasizes the enormous variation in human development, using the constructs of the developmental web and the central role of adaptation to the environment in the service of survival. As we present these three examples of young children who are “different” we will explore their developmental trajectories through considering their functioning both within and across developmental domains; it is the interface of this functioning that we will characterize as an alternative developmental pathway.

One promising contribution to this integrative approach of describing developmental pathways in early childhood is dynamic systems. The power of dynamic systems theory derives from analyzing stability as principles of order within variation. A system’s development occurs through the dynamic link between the stability of a state and the variation around that state. Thelen and Smith (1998) describe the formation of relatively stable biological and behavioral states that can be reliably predicted; they also describe the constant variation around this stability. It is this holistic construct that serves as the basis for considering the interface of multiple domains of development – cognition, emotion, attachment – and its corollaries – motivation, verbal and non-verbal communication, and regulation - in the young child. This perspective argues for the integration of biology and behavior at a theoretical level that must focus on the stability

and variability within each domain as well as the integration and timing of each with the other. It is through this lens that this chapter has been constructed.

Several assumptions about the nature of development and the pathway transgressed by any given child are important to consider at this point. Our understanding of the changes and continuities of the developmental process is based on assumptions about the nature of developmental pathways. We propose that development forms a web of multiple pathways or strands rather than the more common assumption that development proceeds along a single ladder of stages. This developmental web is the norm for the full range of skills, from relationships to reading (see Figure 1).

Additionally, this model assumes that people do not have integrated, fundamentally logical minds, but instead have naturally fractionated strands of the web that can be potentially integrated over time (Fischer & Ayoub, 1994). The nature of the developmental process across the life span is to continue to integrate these strands as well as to further create as well as to differentiate them. The conclusion here is that although emotions, regulatory processes, and communication skills as well as complex cognitive schemas like working models of close relationships develop systematically through a series of skill levels, such skills will vary across the strands in the web and will not necessarily form a unified whole. This whole, be it unified or segmented is the child's developmental pathway. In young children, the variation observed is in good part due to the variety of patterns of integration and differentiation in the web and the timing and context of the expression of each skill set. However, skill theory allows for both developmental synchrony across skills as well as disconnection or splitting of skill sets

within the individual; each is an adaptive move within the developmental process (Fischer & Bidell, 1998).

On the side of thinking and learning, the cyclical changes in capacity in given domains are not evident in young children in everything that they do because most of their acting, thinking, and learning does not push the limit of their capacities. These new capacities can be matched with growth cycles of the brain, especially the cerebral cortex (Fischer & Rose, 1998; Case, 1991). This rich biological concept of recurring growth cycles that predict both behavior and brain changes occur in repeating patterns of common developmental progress called a developmental level. In the last few years, new discoveries about brain functioning have led to evidence of recurring cortical growth cycles and the striking parallels of these cortical cycles with the cognitive-developmental cycles for levels and tiers. Derived from a neo-Piagetian frame, the nested cognitive developmental tiers include reflexes, actions, representations and abstractions. Within each tier there are processes that organize thinking in the context of single units - mappings and systems of each of the four tiers (Fischer & Rose, 1998).

However, when a new developmental level emerges, optimal performance along most strands shows discontinuity, reflected in growth spurts and reorganizations, which are marked by changes in direction, forks, and intersections of strands in the web. These changes do not occur all at once, but are distributed across a specific age period or zone. With the development of each level, the young child can build new, more complex kinds of skills or understandings in diverse domains. Usually a child only produces this optimal level with strong contextual support – like that from a parent or teacher. Without such support, most thinking and learning occur at lower levels, not at the optimal level. These

phenomena contribute to the diversity and dynamic movement within pathways as both stability and adaptation continue to play off of each other resulting in variation in the behavioral presentation of the young child at any given moment in time.

In order to consider the interface of cognition, emotion, motivation, and attachment interactions one must first review the constructs that apply to each developmental process and then examine their intersections. Because development depends upon both stability and flexibility, both within and across domains, these two constructs are the corner stones for understanding the developmental interface that describes for each child the way in which early development potentially influences later functioning.

Affective Development and Attachment Constructs

The primacy of sensory and affective development for the first year and a half of life (Schoore, 1994; Lyons-Ruth, 1998) provides a foundation for the cognitive and relational learning that moves so quickly through the preschool years. One of the very first tasks of the infant is to develop affective attunement to her caregivers (Stern 1983). Such attunement protects the infant from the helplessness that is characteristic of the first two years of life. In their early forms, working models primarily incorporate young children's own motives and experiences in attachment relationships. However, by 1 to 2 years of age, children begin to recognize that their attachment figure's emotions and motives can differ from theirs. At this point, the child's attachments become goal corrected partnerships in which their working models incorporate their own intentions and desires as well as their understandings of other's intentions and emotions (Marvin & Britner, 1999). Working models of close relationships depict development, maintenance,

and dissolution of attachments in terms of general role relationships specifying particular types of interactions and accompanying emotions.

The notion that attachment in its most popular form treats working models as divided into three organized categories - secure, ambivalent, or avoidant as well as a disorganized fourth category - should be regarded as a starting point rather than the basis for models developing over time. In contrast we suggest that the analyses of developing relationships in young children is much more differentiated than these four categories and should include attention to context and culture as well as to security in the development of working models of relationships (LeVine & Miller, 1990). These diverse components of working models are all needed to describe the interface of emotion and cognition as well as the development of alternative pathways of development.

As evidence of the biological and affective interface, we can explore how early object relations directly influence the emergence of the frontolimbic system in the right hemisphere (Schore, 1994). A related way to map the young child's move from helplessness to competence is through the study of systems of physiological and emotional self regulation (Shonkoff & Phillips, 2000). Self regulatory tasks encompass the management of physiological arousal, emotions and attention. The acquisition of behavioral, emotional and ultimately cognitive self-control has been proposed as the fundamental building blocks of competent functioning (Bronson, 2000; Kopp, 2000). Arousal is regulated through attachment relationships as well as temperamental characteristics (Van der Kolk, 1996).

Regulation is deeply embedded in early relationships. Over time cognition and emotion flow together into the development of these patterns of interaction. As the young

child gains cognitive maturity through a series of transformations in thinking, working models of relationships are also transformed to reflect the complexity of this acquisition of increasingly complex skills. However, individuals' worldview, that is their view of themselves and others in the context of a vision of life as a primarily positive versus a negative or threatening experience, has its roots in the nature and continuity of the infant and toddler's primary nurturing relationships with key adults. We propose that the templates for coping skills developed from these primary relationships in early childhood are incorporated into the child's emotional structure and are at each step transformed by the cognitive maturation of the child into adulthood as "working models" that contribute to their developmental path. Children who experience significant and repeated trauma in early childhood, for example, the trauma of physical abuse or the pain associated with the loss of a primary parenting figure, are likely to alter their social-emotional perspective of relationships in fundamental ways (Ayoub, Fischer, & O'Connor, 2003). These alternations, in turn, also impact on the child's cognitive focus, motivation and attention skills. These negative experiences if they are severe or prolonged can fundamentally alter the young child's developmental trajectory across domain influences that reinforce each other. Two central organizers of developing close relationships that are potentially re-organized as a result of negative life experience, for example, are the positive-negative dimension of emotions and the natural patterns in differentiation and integration that occurs with developmental growth that leads to increasingly complex cognitive thought (Fischer & Ayoub, 1994). It is these two organizing principles, which we will examine in exploring the interface of developmental domains and the development of individual working models and ultimately, pathways, across early childhood in our three examples.

Emotion and Self Regulation Constructs

Emotional expression and regulation are tasks that begin in infancy and are consolidated throughout early childhood. In infancy, expression and regulation center on engaging with and responding to the senses. The infant feels hungry, sleepy, cold or hot, alert or fussy. But as children grow, their physical states become much less powerful in predicting their emotions, and feelings hinge on the interpretation of experience in the context of causal understanding and relationships. Both individual and cultural meanings affect how children construe and react to their environments (Miller, 1994; Miller, Fung, & Mintz, 1996). Throughout early childhood the frontal neocortex matures and become interconnected in order to aid in more accurate emotional appraisal and emotional self regulatory functions. As the infant soon differentiates a cry – one for pain, one for discomfort, and one for hunger - the toddler quickly refines those responses into differentiated feelings of anger, fear, guilt, joy and love that continue to be elaborated through the pre-school years. Young children identify and differentiate negative emotions more specifically than positive emotions during the first three years of life, and the bias toward differentiation of negative emotions continues into adulthood (Shaver, Schwartz, Kirson, & O'Connor, 1987). This imbalance supports the need for self-preservation of the organism in its relatively helpless state.

One of the central organizers of developing thinking and relationships is the positive-negative dimension of emotions, which produces natural affective splitting of development into separate strands. Biases or constraints growing from positive and negative experiences organize action and thought from birth and thus shape development (Fischer, Shaver, & Carnochan, 1990). One of the most obvious ways that the evaluation

dimension organizes behavior is affective splitting, in which a person separates two events, people, objects, or aspects of a situation into positive and negative, even though to another observer the things are neither truly separate nor simply positive and negative (Harter & Buddin, 1987). Affective splitting is normative in the developmental process; splitting is also important for development of psychopathology, and in cases of recurrent negative life experience, it can serve as one coping strategy that results in a different personality organization or path. Recent work in the area of trauma and psychopathology supports a connection between the repeated trauma of early child abuse, for example, and a pervasive array of changes in thinking and emotion that produce serious disturbance (Terr, 1991). Symptoms include basic fragmentations in a person's sense of self and malignant feelings of inner badness at the core of beliefs about self and world.

Learning to understand emotions and being able to regulate them are primary tasks of early childhood. Although emotional understanding develops as a foundation for cognitive learning, it also grows in concert with the development of other forms of knowledge. Children's developing frameworks for inferring what other people are thinking, believing, intending, and feelings as well as for making predictions about how they will respond are evident in toddlers (Astington, 1993; Flavell & Miller, 1998) and continue to develop during the preschool years. The connection between emotion and expectation, the roots of "theory of mind" - for example, the glee of the young child in "fooling" the adult - offers evidence of the young child's ability to make these connections across domains and to act on them in complex ways (see Barr, this volume).

Another component of affective development in the early years is the emergence of executive functioning which can be mapped to early frontal lobe development as well

(Schoen, 1994). Hypothesis testing, impulse control, and planning are all characteristics that develop during this early period. Each is influenced by attention, memory, and concentration. Here the overlaying boundaries between cognition and emotion are most obvious (see Welsh, Friedman, & Spieker, this volume).

Cognitive and Motivational Constructs

Children from birth begin to make sense of the world in many ways including spatial reasoning, physical causality, problem solving, categorization and counting and quantification. These are the major tasks that have been associated with core intellectual competence in early childhood. Learning in these areas provides the foundation for complex reasoning. Infants become attuned to causal relationships and can distinguish causal sequences as well as the effects of their own behaviors on others (Mangeldorf, 1992). Toddlers can recognize that other people have different tastes or preferences and by age 4 young children can recognize everyday categories. By age 5 children can predict another person's intentions and recognize deception. Interestingly, the most varied differences in children beginning kindergarten are their skills in executive functioning. Although they may universally be able to understand causality, adopt another's perspective, and sort objects by categories, kindergarten children differ tremendously in their ability to learn, sequence, organize and self-regulate their emotions; these differences often account for the most common problems described by their kindergarten teachers (Lyon, 1996).

Young children develop these cognitive abilities through orderly sequences of skills or concepts, showing abrupt stage-like discontinuities under some circumstances, and demonstrating some synchronies across tasks and contexts. In addition, children

operate in a developmental range along each strand of the web. As a result different children often develop along different pathways and their ability to express and sustain their pathways becomes increasingly complex with age.

Early childhood is a critical time for the development, refinement, and consolidation of self-organizing motivational processes. Many 2 and 3 year old children prefer and enjoy taking the role of a mean aggressive character, who often has more power and controls the action in a story or game. They also tend to understand these vivid negative roles better than positive roles (Fischer, et. al., 1997). By age 4, however, most children have given up the negative and mean for the positive characterization of people and events close to them. Furthermore, in pretend play the preschooler will often call on the “super hero” – the super good, all powerful entity – to save the situation and vanquish the evil “other.”

However, genetic predisposition, context, and attachment models can lead to differences in self-organizing motivation. Children who are quite inhibited temperamentally have more difficulty with negative appraisals (Fischer & Ayoub, 1994). Children who have experienced serious and repeated negative life events like child maltreatment may have negative and conflicted working models of self in relationship to other that will affect their self-appraisal. Finally, cultural differences come into play to re-orient appraisals within positive or negative categories. For example, in Chinese cultures shame is a powerful negative emotion (Li, Wang, & Fischer, 2004), associated with self- appraisal while in western cultures guilt is more common.

Communication constructs. Whereas for the young child language serves primarily social goals, such as negotiating intimacy with the parent, defining a self

separate from the parent, communicating needs and desires, and representing one's own point of view, increasingly over the preschool years language is used as the mechanism for gaining access to information about the physical and social world. The vocabulary spurt that typically occurs late in the second year of life presages an increasing focus by the learner on acquiring new words that in turn index access to new domains of knowledge, ranging from the biological (e.g., animal names, bodily functions) to the social (e.g., kinship terms, games) to the psychological (e.g., inner state words, relationships). Beginning around age two, substantial individual and social class differences in rate of vocabulary acquisition begin to emerge, such that there are striking differences in total vocabulary size even before children enter kindergarten (Hart & Risley, 1995).

As children start to develop language, they begin to form a history of the self (i.e., autobiographical memory). Parents and other caregivers help regulate children's affective experience and assist in the development of a coherent life story and a cohesive self (Palombo, 1992). There is growing evidence that preschool children who have been exposed to significant and persistent negative experiences are at risk for constructing a lexicon of negative affect states related to the self (Nathanson, 1992) and are less adept at behavioral and affective regulation (Shields, Cicchetti & Ryan, 1994). They may develop rigid and controlling ways of interacting with others (Fischer et al., 1997). Adult caregivers influence children's expressive systems by helping solidify links between their cognitive problem solving, emotions, and language use. Parents who talk about feelings and conflicts tend to have children who develop a better understanding of emotion (Bretherton, Ridgeway, & Cassidy, 1990); those who encourage appropriate expression

of negative emotions have children who tend to be more sympathetic and socially competent (Eisenberg & Fabes, 1992).

Constitutional contributions of the child. Study of the evolution of developmental pathways would not be complete without understanding the individual differences that the child brings to the process. Genetic predispositions, specifically temperament, is one such consideration. Most attention has been paid to those children who are inhibited, anxious and uncomfortable with other children (Kagan, et. al., 1987; Fox, Henderson, Rubin, Calkins, & Schmidt, 2001). These are children who appear overly sensitive to negative affect and wary of interaction with peers. However, many inhibited infants do not remain so (Fox, et. al., 2001). Some of these children need more time to develop relationships, but are able to do so if given extended opportunity (Asendorpf, 1989). Interestingly, children who tend to feel things more intensely than their peers – feelings like anger, sadness or fear – but manage to control their emotions do not have as many problems as their counterparts with similar levels of emotional sensitivity who cannot control their emotions and actions (Fabes, et. al., 1999). It is not inhibition alone that predicts the differences in children’s functioning, but the interface of inhibition and self-regulatory skills mediated by environmental supports.

Interface of Developmental Domains: Examples Based on Differences in Temperament, Disability, and Negative Life Experience

In this section we offer a series of examples of the interface of developmental domains, which serve as the basis for the development of varied pathways in young children. Our aim is to offer a set of extended examples of a “person-in-context” perspective to demonstrate how conventional concepts of and approaches to the study of

domains in early development have mischaracterized children as delayed, immature, disorganized, or disoriented. Through the research literature and our own data, we identify distinct, complex and, in some contexts, adaptive developmental pathways exhibited by young inhibited children, autistic children and maltreated children.

Diversity in Normal Development: The Role of Inhibited Temperament

Webs of different shapes are produced by variations in emotional state and the child's ability to regulate those states. The first distinctive feature of alternative developmental paths has to do with the changes in the balance of positive and negative valences and biases that develop over the first 6 years of life. Anger facilitates control of complex mean interactions, and happiness facilitates control of nice ones. Each emotion evokes a preemptive social script in young children that biases them toward the positive (self-organizing motivation), including a certain interpretation of other people's behavior. An anger script (resulting from working models that include significant anger) biases the child toward taking offense at another person's actions, and therefore toward seeing someone else as mean and in turn acting mean. On the other hand, a joy script or a working model with positive and nurturing components, will bias the child toward the positive, including a tendency to interpret actions as nice and in turn to act nice. This understanding will become more complex over time as the child moves from simple actions to mappings and systems of actions followed by representational thinking. Shifts in the child's ability to coordinate positive and negative emotion may assist the young child in regulation (see Figure 2).

For example, children who are shy or behaviorally inhibited (Kagan, et. al., 1987; Fox, et. al., 2001) show a bias toward the positive and avoidance of the negative even during the

toddler and preschool years. In a longitudinal study of inhibited and outgoing children, highly inhibited children have shown bias toward nice when telling stories about both nice and mean interactions. These inhibited children avoid the mean interactions much more strongly than their non-inhibited counterparts, especially when the stories involve the character identified as the child herself acting mean (Fischer & Ayoub, 1994). This avoidance of mean persisted even when the inhibited children were specifically asked to imitate a story about a mean interaction. The inhibited children's reactions to the mean stories were less well regulated and more intense, or they seemed unable to understand the mean stories. This included identifying both simple mean tasks and those that included both nice and mean actions. The delay was specific to mean stories and was not present in other developmental measures. In terms of an alternative developmental pathway, the shy child showed a shift in the web that favored the positive and delayed the negative (see Figure 3). The shift is predicted to be especially evident for representations of self, where negative evaluations are rigidly shunned. The normative course of negativity bias until at least three years of age does not hold for the shy child. We can speculate about how this might impact the child by considering developmental trajectories in other domains. For example, inhibited children who are sensitized to mean avoidance and who are also unable to regulate their emotions may be at more risk than inhibited children who react with withdrawal, but do not create negative situations and suffer rejection by peers. In this case, however, the sensitivity to negative in inhibited children may increase the potential impact of disruption in other developmental processes as well as the children's innate abilities and the environment in which they live. Their vulnerability due to their heightened sensitivity to mean interactions may also be

protective in some situations and make them more prone to distress in others.

Diverse Pathways in the Face of Disability: The Role of Autism

A second distinctive feature in the development and maintenance of diverse developmental pathways relates to the presence of alternative patterns of fractionation and integration of skills across domains. Development is naturally fractionated in a kind of passive dissociation, with skills organized independently in terms of domain, task, context, and emotional state. A child's mind contains a number of different control systems that are not connected to each other. Naturally, this is most true during the child's early years. Because of the pervasiveness of fractionation, young children frequently cannot even represent that certain elements go together in the world, such that people are both good and bad (until they are capable of representational mapping). Fractionation of particular domains need not remain permanent, however, because skills can be integrated, and are as development proceeds. Active coordination of more and more complex skills occurs as the child gains the cognitive ability to connect them in increasingly complex ways. Integration occurs across emotional domains as well, including coordination of positive and negative categories.

However, children can use coordination as an adaptive mechanism for active separation between domains as well as for integration. Controlled separation or dissociation is pervasive and is typically seen in situations in which children are exposed to recurrent negative life experiences. In addition, although dissociation is sometimes totally unconscious, it can involve degrees of consciousness, in both normal and pathological situations. The separation can produce a misleading appearance that a person's skills are low level and uncoordinated, although they in fact may involve high

level coordination for the purpose of dissociation. On the other hand, other pathways may include children who use extreme control through nurturance to manage their worlds and thereby presenting themselves as more competent and integrated than they actually are.

Autism offers an example of how a disability can promote an alternative pathway in response to a functional genetic differences coupled with environmental responses. Although many have believed that autistic children are globally delayed, their presentations may instead be examples of alternative pathways given their severe impairments in understanding their emotions, other people, and relationships. These deficits, based on abnormal brain development (Kanner, 1943; Minshew & Pettegrew, 1996), impact the child across domains. Children with autism typically miss the relational connections in speech and gesture and are unable to identify the meaning of basic signals of emotions (facial expression, tone of voice, words). These deficits seem specific to feelings, other people and social relationships, and do not involve general retardation or developmental delay. Indeed, a number of autistic children are extremely intelligent and can acquire sophisticated, specialized skills.

Donna Williams, in *Nobody Nowhere* (1992), has written a compelling account of her early life and experience as a developing person with autism. Few autistic individuals have written autobiographies, but Williams describes her different pathway vividly. She provides a valuable resource for moving beyond normative interpretations of autistic behavior in the context of the interface of multiple developmental domains. In conjunction with autistic people's difficulties understanding and relating to others, they often have difficulty comprehending spoken language. Williams describes the experience of hearing language as a young child as if the sound had to go through some

“complicated checkpoint procedure” (p.69) with her segmentation of the sounds often producing a strange and unintelligible message. Her problem is not deafness or emotional distress, but analysis of language. This might explain why some autistic individuals benefit from using an alternative form of language such as American Sign Language (Bonvillian & Nelson, 1978).

William’s descriptions of her early life and the evolution of her thinking provide a basis for understanding the “different” integration of her developmental path. Especially important characteristics of her development were her difficulty in integrating social-emotional information, her hypersensitivity to too much sensory stimulation, including touch, and her strong ability to tune out events around her. A simple example of her skill and her deficit was her reaction to someone commenting on her singing as a young child. After hearing the comment she stopped singing in front of other people, evidencing remarkable self control in order to avoid being heard, but she did not realize that people could hear her even if she could not see them.

Central to William’s developmental adaptation was the construction of agents or shells to both communicate with others and to protect herself from the outside world. These compartmentalized agents indicated increasingly complicated skills starting at an early age and continuing through adulthood. For example, by age 3 years she had constructed an agent she called Willie to protect her from frightening people and situation. Willie was described as having a “hateful glaring eye, a pinched-up mouth, a rigid corpse-like stance, and clenched fists. Willie stamped his foot, Willie spat when he didn’t like things, but the look of complete hatred was the worst weapon” (p. 11).

Already during the preschool years, Williams had become skilled at purposely turning herself into Willie (“losing myself”) when she needed protection.

When viewed from a single domain or from the perspective of normalcy, deficits in autistic children appear everywhere, but such analysis fails to capture the real development across domains that is occurring in autism. The social-emotional and perceptual deficits are genuine, but so are the accomplishments growing out of the autistic framework. The final important point to make is that Donna’s behavior made use of the skills she had in ways that aimed at mastery and adaptation in the best way she knew how.

Diversity in the face of environmental trauma: The role of child maltreatment.

Conventional views on psychopathology following early maltreatment experiences assume immaturity or developmental delay resulting from fixation or regression. This perspective has been elaborated in the empirical literature, as methodological approaches to the study of developmental psychopathology have been built on traditional concepts of development that favor unidirectional, homogeneous growth regardless of context (e.g., Eigsti & Cicchetti, 2004; Veltman, Marijcke, & Browne, 2001). Contrary to this view, we propose that maltreated children have been shown to demonstrate complex skills requisite to their particular, unique experience and on par with their non-maltreated age-mates, even when psychopathology is evident (Fischer et al., 1997).

The attachment literature offers a helpful example. Abusive or neglectful behavior by a parent often results in the formation of an insecure attachment between the child and parent (Crittenden, 1985; Schneider-Rosen, Brunwald, Carlson, & Cicchetti, 1985). As a result, maltreated children’s behavior toward abusive parents has most often been

described as disorganized and erratic, shifting between approach and avoidance strategies. This pattern of interaction with the parent may become generalized and elaborated in the child's other relationships with adults and peers, such that abused children may appear unpredictable, volatile and rigid (Darwish, Esquivel, Houtz, & Alfonso, 2001; Mueller & Silverman, 1989). Researchers have theorized that maltreated children typically evidence disorganized and disoriented attachment (Cicchetti, 1991; Crittenden, 1985).

However, we propose that the behaviors of "disorganized attachments" are neither disorganized nor disoriented. Instead, they represent a trauma dance composed of adaptive fight-flight coping mechanisms that evolve in response to trauma and physical threat and that eventually produce distinctively complex developmental pathways of highly sophisticated adaptation to traumatic environments. From the child's perspective, approach-avoidance behavior is self-protective, organized in the context of an environment where the primary caregiver is both abusive and nurturing. In contrast to traditional psychoanalytic theory, maltreated children do not demonstrate developmental delay or fixation of their relational models, nor do they show incoherence (Solomon & George, 1999). Instead their socioemotional development follows a fundamentally different relationship pathway, which in its own terms is both developmentally advanced and coherent, adapted to the shifting behavior and inconsistency that they experience with their caregivers.

With development, these skills become even more sophisticated as children hone their defenses. This increasing complexity and sophistication puts abused children on par with their healthy peers with respect to their relative complexity of cognitive skills but at

risk for psychopathology including depression, oppositionality, dissociation, and peer relationship problems (Briere, 1992). In this way, the abused child's behavior is both adaptive and maladaptive, depending upon the circumstance, making survival in the home possible but survival in other contexts challenging.

If maltreated children's behavior can be characterized as both adaptive and complex, why does developmental psychology persist in labeling these children as delayed? It is our perspective that this mischaracterization stems from the persistent view that development occurs in a domain general and unidirectional way, regardless of context. The result is a lack of recognition of the child's "different" developmental pathway. In order to illustrate this fully we present a study of young maltreated children that specifically considers their functioning in several developmental domains and their interface (see Ayoub & Schlichltmann, in press). In contrast to the more 'normative' positivity bias described in the beginning of the chapter, children who grow up in abusive and violent homes have been shown to develop a powerful and pervasive negativity bias in their play and early relationships (Fischer et al., 1997). This bias is likely the developmental precursor to the negative worldview so often described in traumatized adults.

To better understand this alternate developmental pathway we observed maltreated and non-maltreated toddlers and pre-schoolers during structured storytelling assessments (Fischer, K., Hencke, R., Hand, H., Ayoub, C. & Russell, C., 2001). Fifty-three children, from 22 to 73 months, were interviewed for this study: half the participants were maltreated and the comparison participants matched on socioeconomic status and ethnic group membership. Children were asked to retell and/or act out a series

of 17 nice, mean, and combined nice and mean stories that describe interactions between a self doll and several friend dolls. The stories begin simply with a nice interaction between the self doll and a friend doll at the level of single representations. Stories were told in order of increasing complexity, forming a developmental sequence based on Fischer's dynamic skills theory. Children's performance on each story was coded on two variables. First, participants were coded on whether or not they successfully re-told the story. Children could successfully pass by either verbally telling the story, or by acting the story out with dolls or both. To successfully pass a story at a particular level of complexity the participant must be able to attend to the story and accurately represent, verbally or non-verbally, the characters as nice or mean and the various component parts of the story. The interviewer continued through the series until the participant failed to correctly retell three stories in a row. The participant received a score (skill level) for correct completions corresponding to the last correct completion prior to three failures. Second, participants' stories were coded for complexity of representation regardless of whether or not the story was retold correctly. A participant, for example, might switch who was nice and who was mean, or make a nice story mean resulting in a 'failure' to correctly retell the story, but tell a highly complex story nonetheless. Children were given a score corresponding to the complexity of the story with which they exhibited the highest skill level regardless of whether or not the story was told correctly.

There was an effect of having a maltreatment history on children's complexity of story telling performance, but only for the structured component of the assessment. That is, children with a maltreatment history tended to successfully complete fewer accurate re-telling story tasks prior to three failures than their non-maltreated peers. This 'gap'

between the maltreated and non-maltreated performances was larger among older children. Maltreated children differed the most from their non-maltreated counterparts in the retelling of nice stories – they reproduced nice stories only half as often as their non-maltreated peers. Importantly, there were no differences in the complexity of stories told between maltreated and non-maltreated participants when correct story replication was not taken into account. These effects are illustrated in Figure 4.

Maltreated children's alternate developmental pathway as it varies in two contexts is clearly illustrated in this example. In Figure 4A we see that older children, whether maltreated or non-maltreated, tend to exhibit higher skill levels in correctly representing nice/mean interactions during this structured story telling task. However, in comparison these two groups exhibit quite different developmental trajectories. Specifically, young maltreated children tend to be more complex when correct early on but the rate at which they become more complex and correct over time is slower in comparison to their non-maltreated peers. This results in a large 'gap' in performance by five years of age, with the non-maltreated children tending to re-tell more complex nice and mean stories correctly.

At first glance it would seem that the traditional characterization of maltreated children as 'delayed' was correct at least in part, but there is more to this story. In Figure 4B we see that without the constraint of having to correctly re-tell the story there are no differences in the maltreated and non-maltreated children's cognitive performances throughout early childhood. The maltreated children tell nice and mean relationship stories just as complex as their peers, but only under particular conditions. On closer examination of the data we find that the maltreated children are more distractible, often

refusing to do the task as presented, and tend to ‘switch’ the content of nice stories to be mean. They also tend to “fail” at telling the nice stories and spend much more time and energy than their counterparts telling richly detailed negative stories. They often convert nice stories to mean ones.

For example, Donald in modeling a nice interaction of the self doll with the other doll says forcefully, "Guy, you wanna fight? I'll knock you down. He fight him. They fight. You wanna fight. I'm gonna fight you. Fuck my butt, fuck it." The examiner who reminds him that the task is to construct a nice story then supports him. With this social support, Donald is able to say, "Have some playdough, guy, don't leave me." Donald at first is unable to repeat a nice story; his story is an elaborate mean interaction from the beginning. Support from the examiner does enable Donald to give a positive response, but this response is followed by an abandonment theme ("don't leave me").

It is not that the maltreated children are ‘delayed,’ rather they exhibit an alternate developmental path commensurate with their early experience, demonstrating more skill with, and selective attention to negative situations and relationships (Fischer et al., 1997) and selective inattention to positive tasks. This developmental pathway seems to make attention and persistence on structured school like tasks difficult (Porter, 2003) especially for tasks that do not capitalize on these children’s honed skills around threat related signals (Pollak & Tolley-Schell, 2003). As skill development involves complexity as its central dimension, change over this dimension clearly illustrates how maltreated child, like non-maltreated children, are capable of the same level of skill complexity but in a different context and with different biases based on emotional and contextual schemas.

Conclusion

The presence of alternate developmental pathways for inhibited, autistic, and maltreated children highlights the point that research in human development that focuses on only one or even a few instances of individual and contextual variation is not useful for understanding the development of all children. In these cases assumptions about the child's cognitive and social development, made in the absence of context and assessment of domain intersection, leads to the erroneous assumption that the child has a cognitive difficulty or delay. The practical conclusion leads practitioners to consider an illusive cognitive delay that is addressed without acknowledgement of the child's actions as adaptive and developmentally maturing responses to an adversarial environment. Furthermore, policies and programs in education stemming from research that assumes a unidirectional, homogenous course of growth for all children will not be appropriate for all individuals, across contexts.

A view across domains of development in early childhood allows the observer to begin to understand the complexity of the interface between the strands of skills that make up the developmental web and the organization of those strands that can be characterized as a variety of developmental pathways. An integrative approach to early development promotes the ability to assess and support the whole child by examining the child's holistic functioning without losing sight of the interaction of domains one with another. Distinctive developmental pathways constructed by the young child in response to constitutional, environmental, or cultural conditions are not developmentally primitive or delayed. To the contrary, they are sophisticated adaptations in which these young children construct powerfully different affective-cognitive-communication organizations. Whether these adaptations stem from culture, family, or body, scientists and practitioners

need to appreciate the complexity and effectiveness of pathways of variation within functional and pathological processes. Only then can we truly consider effective intervention and prevention.

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Author Note

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Figure 1. The developmental web for two relationships.

Figure 2. Developmental web for normative mean and nice social interactions.

Caption: The numbers to the left of each set of brackets indicate the complexity ordering of the skill structures. The words and symbols with the brackets indicate the components of a skill structure. The arrows indicate order in the developmental pathway.

Figure 3. Developmental web biased toward nice interactions due to inhibited temperament.

Caption: The numbers to the left of each set of brackets indicate the complexity ordering of the skill structures. The words and symbols with the brackets indicate the components of a skill structure. The arrows indicate order in the developmental pathway.

Figure 4. Maltreated children's cognitive performance under two conditions

- A) Average performance, accuracy and complexity, on structured story telling task; Only correct performances count.
- B) Average complexity of performance on structured story telling task; Any performance counts

Figure 1. Developmental Web for Two Relationships.

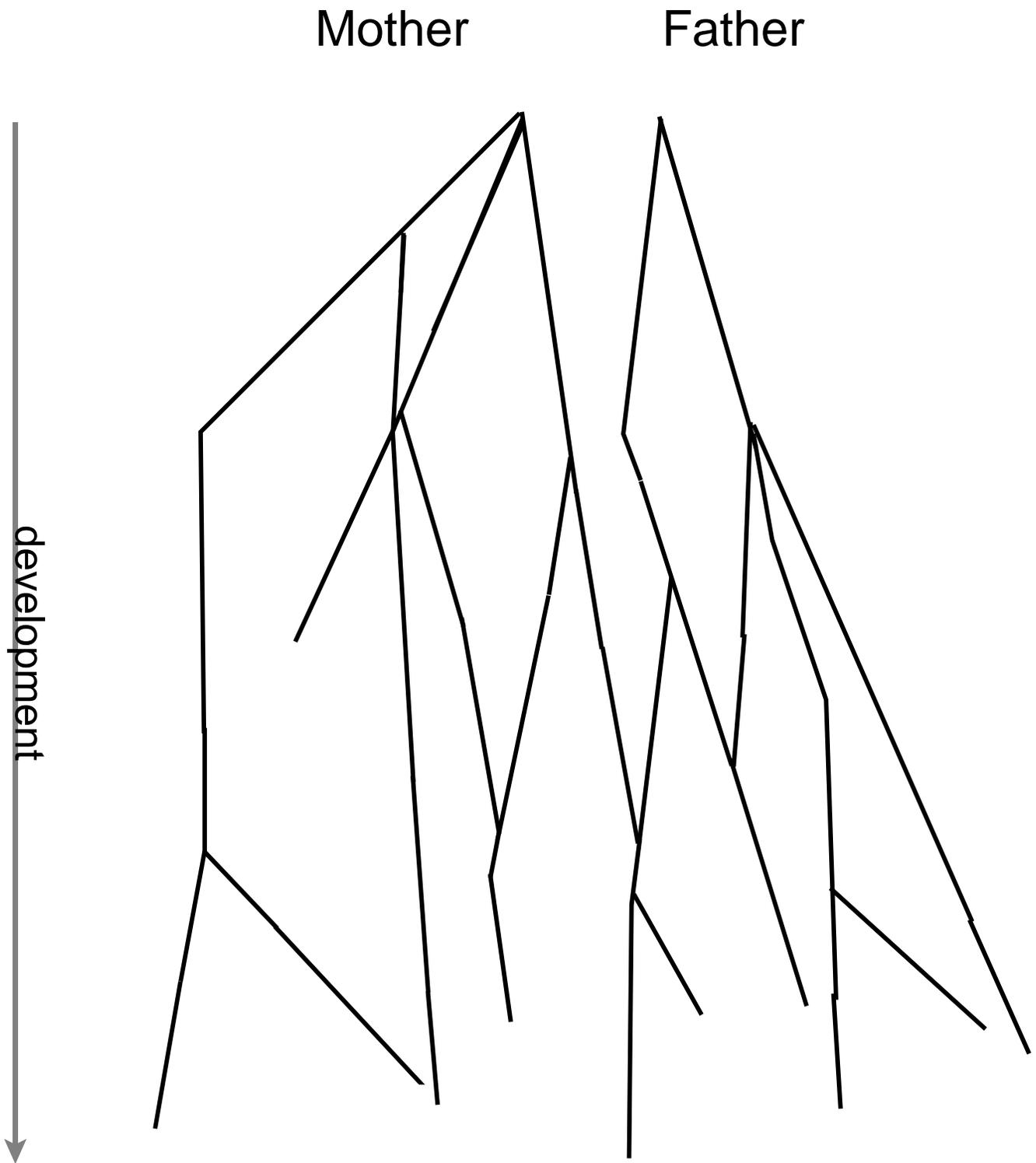


Figure 2. Developmental Web for Mean and Nice Social Interactions

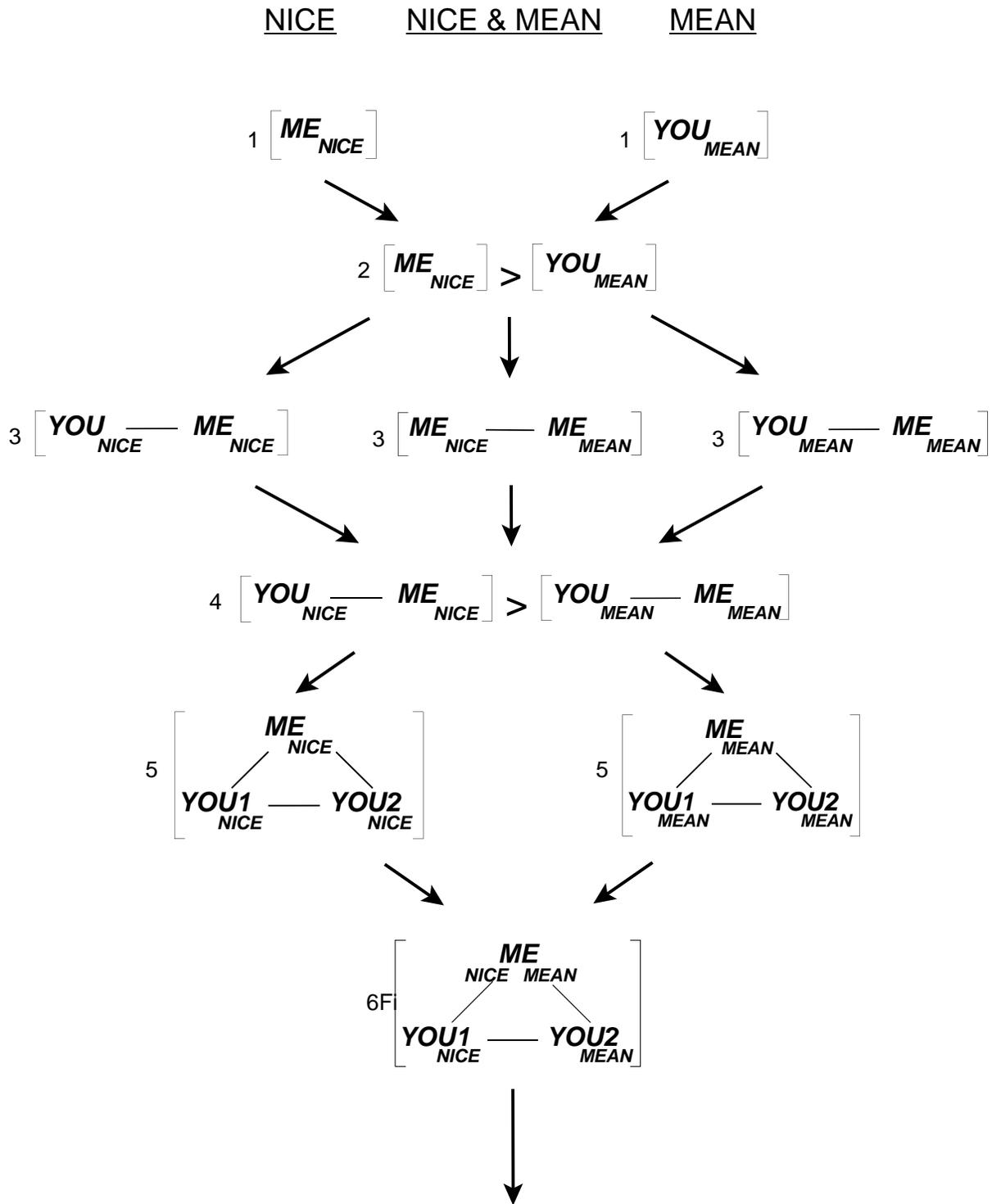
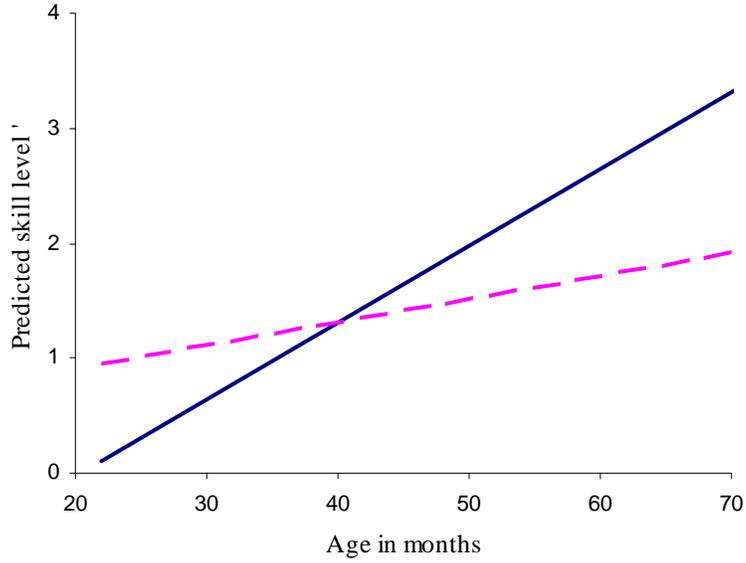


Figure 4. Maltreated children’s cognitive performance under two conditions

4A) Average performance, accuracy and complexity, on structured story telling task; Only correct performances count



4B) Average complexity of performance on structured story telling task; Any performance counts

