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The Innate Capacity for Representing Subjective Experience: The Infant's Mind Is Neither Primitive nor Prerepresentational

The author cites the prominence of theories that locate serious adult psychopathology in the preverbal infant's inability to formulate or represent traumatic experience. The work of two such authors, H. Levine and D. B. Stern, is briefly considered. The frame of reference for this investigation is that clinical and academic research findings are highly relevant to psychoanalytic theorizing. It is argued that when such findings are considered, a view of the infant with "primordial and unrepresented" states of mind has little evidence to support it. In fact, research findings summarized herein point to an opposite view: that of the "competent infant," one with highly accurate perceptual discrimination capacities and an innate ability to register and represent subjective experience in both procedural and declarative memory, even prenatally. Given the infant's competencies, it seems implausible to hold that representational deficits are at the heart of serious adult psychopathology, which is instead seen to be the result of defensive maneuvers against unknowable and unspeakable truth rather than the absence of a preverbal representational capacity. Current research findings seem to pose a significant challenge for psychoanalytic theories that espouse "primitive mental states"; "unrepresented," "unformulated," or "unsymbolized" experience; or "nonconscious" states.

Keywords: development, trauma, infantile, symbolization, research, primitive mentation, unrepresented experience, unformulated experience, mental representation

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From the beginnings of psychoanalytic inquiry, a crucial question regarding development has been, what is the relation between infant mentation and adult pathological states? The answer to this question has implications for how we view the individual, the analytic dyad, and therapeutic action. Freud believed that adult pathology directly reflected infant mentation, proposing, for example, that what he called primary process thinking was characteristic of adult psychopathology and the normal infant mind. Much current thinking about adult pathogenesis seems to have revived this belief regarding its source in "primitive" infant mentation.

In the call for papers for the 2021 meeting of the International Psychoanalytic Association, whose title was "The Infantile," the Vancouver Congress Program Committee wrote, "Psychoanalysts all over the world have greatly deepened the idea of the infantile, towards including primordial and unrepresented states of the human mind." Continuing their introduction, the organizers opined, "Without the notion of the infantile, Psychoanalysis would simply not exist."

Through varied conceptualizations, this notion of an infant with "primordial and unrepresented" states of mind has become an unquestioned belief among a great many psychoanalysts across schools of thought that would otherwise have little to do with one another. The "infantile," that is, the infant's "unrepresented" or "unformulated" experience, has come to be viewed as a primary pathogenic factor in Kleinian, French, and relational theories.

In Freud's initial formulations, the goal of treatment was the lifting of repression so as to recover organized psychic elements, especially unconscious fantasies (i.e., thoughts and affects that had at one time been subjectively experienced, but subsequently sequestered from consciousness) (Freud, 1915). The current thinking regarding "unrepresented" or "unformulated" mental states has generally been that such experience could not have been repressed because it was never "symbolically" represented. Instead, these proto-experiences have manifested themselves via somatic complaints, behavioral enactments, dissociation, and the inability to play or dream, that is, in what are presumed to be "unsymbolized" states. Freud's repression model has been either challenged or augmented by authors from otherwise divergent traditions, particularly as illustrated in the work of H. Levine (2012, 2020, 2021; Levine, Reed, & Scarfone, 2013) and D. B. Stern (1983, 2010, 2015, 2020). Their differing but

related models represent perhaps the most fully codified versions of "unrepresented" or "unformulated" experience as primary pathogenic factors. Thus, although many other authors have also proposed variations on this theme, mostly without consideration of research findings regarding infant representational capacity, I will focus on Levine and Stern's most fully elaborated ideas to demonstrate the potential flaws in this line of argumentation when such findings are ignored.

WHAT IS A MENTAL REPRESENTATION?

The notion of a "mental representation" is a basic concept in the Computational Theory of Mind, according to which cognitive structures and operations consist of the registration, transformation, and storage of information-bearing structures (representations) of one kind or another. Representations can stand for propositional knowledge (involving symbol systems such as language or mathematical formulas) or analogic knowledge (such as imagery, sound, taste, or smell), but they also carry affective valence:

> It is possible for representations to have a strong affective element: Representations can induce excitement, fear, discomfort, exhilaration, and an assortment of other emotions and motivations. . . . Conceptions of representations that fail to acknowledge the "hot" nature of representations in use are incomplete. Representations are therefore explicitly recognized . . . to possess affective and motivational characteristics. (Sigel, 1999, p. 25)

Carey (2009) has argued that our capacity for mental representation is part of what she calls "core cognition," our innate heritage, because the capacity for mental representation cannot be the result of learning processes.

Notice that mental representation, claimed to be an innate mental process, is not at all synonymous with self-reflection, self-awareness, or self-consciousness. Unlike mental representation, the latter can be acquired or enhanced in the maternal dyad or via psychoanalytic treatment. Also, self-awareness, self-reflection, and self-consciousness tend to be encoded in conscious verbal utterances, whereas mental representations are encoded in memory elements that may be unconscious and nonverbal but nevertheless influence an individual's thoughts, affects, and behavior throughout life.

The representation of concepts is distinguishable from percepts, the registration of sensory data. Notice that one never experiences the "raw data" of perceptual experience (e.g., the pixels of visual perception). Our perceptual apparatus immediately converts those pixels into meaningful entities in the brain (i.e., conceptual representations), after which they may be experienced subjectively. The psychophysical facts indicate that it is the brain's capacity to convert "raw" perceptual pixels, *which we do not experience,* into *meaningful* mental representations that constitutes subjective experience.[1]

Cognitive psychologists have long understood that thought and language represent separate mental faculties (Erreich, 1994; Fodor, 1983). It has been generally accepted that the child operates within innately given representational capacities, with language having only weak effects on thought; that is, representational capacities are not acquired in the course of mastering natural languages. Language may indeed make mental representations more salient, but in the main, it facilitates the integration of concepts from core cognition with a language system, including noniconic concepts such as "belief" or "information."

THE NOTION THAT SUBJECTIVE EXPERIENCE CAN BE "UNREPRESENTED" OR "UNFORMULATED": H. LEVINE AND D. B. STERN

This is not, however, how many analysts have understood the status of mental representation, nor the relationship between language and thought. Aligned with Bionian thinking, Levine (2012, 2020, 2021; Levine et al., 2013) has claimed that psychoanalytic technique has evolved from a concern with uncovering or integrating what was already represented but repressed to the *creation of psychic processes such as representation,* containment, and associational linkage "*that allow for the emergence and creation of 'true thought' and meaning* [italics added]" (Levine, 2020, p. 10). This goal assumes the existence of unrepresented or weakly represented states of mind which require psychoanalytic treatment to reach representational status so as to become part of narratives and associative networks. Levine (2012) claims that raw, unrepresented experience can

[1]The use of Rorschach blots demonstrates our mind's tendency to assign meaning even to more or less "meaningless" ink blots. There is no registration of perceptual stimuli that is entirely without meaning.

never be known in its prerepresentational state and is considered "pre-psychic or proto-psychic" (p. 608). Without adequate representation of events, patients cannot think or fantasize, and therefore depend on enactment or somatic discharge. Thus, Levine (2020) answers in the affirmative to the question he poses: "Is there experience, deriving from the soma, the id, the preverbal period of infancy, or traumatic states that is 'inscribed'—somewhere, somehow—perhaps psychic, but not yet ideationally 'represented'?" (p. 11). Furthermore,

> the capacity to transform the inchoate raw data of experience into psychologically representable (mentalizable) elements is a major goal of psychological development, the essence of "successful" human mental activity and at the heart of the transformational aims of the psychoanalytic process. (Levine, 2021, p. 22)

Levine (2012) cites Bion's (1965) claim that without "a system of notation and record which could also be used for manipulation in the absence of the object" (p. 40), an individual can only think about an object when it is present in external reality (2012, p. 611). The Levine/Bion claim is that the existence of such a notational system is the product of a maturing mind, or absent that, a goal of psychoanalytic treatment. Marshaling further support for this view, Levine (2012) cites Aisenstein (1993, 2006), representing the views of the Paris Psychosomatic School, who proposes that "somatic symptoms are initially opaque, devoid of symbolism and psychologically meaningless" (p. 615).

Three aspects of Levine's formulations are particularly notable. First, this account assumes that the capacity to represent or encode subjective experience is a developmental achievement, but one whose absence can be rectified via psychoanalytic treatment. This proposal stands in contradiction to the generally agreed upon conclusion that the capacity for mental representation is innate, that it could not be "learned" postnatally. Rather, Levine's view constitutes a deficit account of pathogenesis, a representational deficiency, for which treatment "is analogous to that of weaving a patch to repair the unity of a torn fabric" (Levine, 2012, p. 614). This sort of deficit account is similar to Mahler's (1972) account of failures in separation or individuation that require therapeutic repair before the individual can move forward in development.

Second, as noted earlier, there are no "inchoate raw data of experience"; subjective experience is the result of our brain's capacity to convert "raw" perceptual pixels into meaningful mental representations, a

process that operates automatically from birth. This psychophysical fact also challenges other proposals regarding representational deficit, such as Botella and Botella's (2005) notion of "figurability," which is their attempt to distinguish between sensory perceptibility and symbolic or conceptual meaning. There is no subjective experience without conceptual representation, even if the representation is inaccurate or misleading.

Third, these formulations regarding representation are instantiated in Freud's topographic model of the mind:

> In the presence of represented unconscious, latent content, the analytic process moves via free association and interpretation from conscious and preconscious surface to unconscious depth. In the analysis of unrepresented and weakly represented mental states, *the elements of mind—conscious, preconscious and unconscious—must first be created by a work that begins in the analyst's psyche and is then offered and inscribed in the psyche of the patient as part of an interactive, intersubjective relationship and process*. (Levine, 2012, p. 626)

Notions of representational deficit are more easily mapped onto the topographic model than Freud's structural model of the mind, a conflict model, wherein functional conflicts among mental agencies lead to compromise solutions that can be instantiated in behavioral enactments or somatic symptoms. These are not necessarily thought of as deficient in representational status because they are enacted or somatized rather than verbalized[2]:

> The notion that somatic and behavioral symptoms constitute some personal code, a semaphore of unconscious meanings expressed via behavioral and somatic flags, surely ranks as one of the most remarkable insights in the history of ideas. Thus it was, that Freud took on the job of cryptographer for his patients' idiolects. (Erreich, 2007, p. 2)

Freud viewed behavioral and somatic enactments as a patient's attempts to both express and solve psychic conflict via somatic symptoms of a motor or sensory nature, what Janet called a "malady through representation" (Laplanche & Pontalis, 1967/1973, p. 195). It was evident to Freud

[2]Bohleber et al. (2013) also illustrate a view of behavioral and somatic enactments as deficient in representational capacity: "Another observation of our study was that actions and enactments are often categorized as unsymbolized or as an expression of a symbolic breakdown. It seems to us necessary to combine a theory of action with a theory of symbolization in order to consider actions in general as expressions of the content of different levels of mental functioning" (p. 526).

that any symptom could represent multiple meanings. As the ego psychological tradition evolved, Arlow and Brenner (1964, pp. 172–173) reemphasized the notion of somatic symptoms as representational: "the symptom is the bodily expression of a fantasy, a fantasy which results from a conflict over an instinctual wish" that has given rise to anxiety and the defense against that wish. The contemporary claims of representational deficit attached to behavioral and somatic enactments stands against these earlier views.[3]

Despite the similarity of these formulations regarding representational deficit to some relational thinkers, Levine (2012, p. 608, fn. 2) is at pains to distinguish his proposal regarding "unrepresented states" from D. B. Stern's notion of "unformulated experience." Levine cites two distinguishing features: First, Stern, unlike Levine, does not subscribe to an unconscious that contains organized, psychically represented subjective states; second, again unlike Levine, Stern's thinking relies on dissociation rather than repression, which Levine allows for in some patients, if not all.

D. B. Stern seems to disagree with Levine, at least about their similar views of representation. In a review of Levine et al.'s (2013) book, Stern (2015) proposes that more severely disturbed patients suffer from "the incapacity to create representations and link them with drive, leaving the mind to function somehow with voids and absences. The crux of clinical work in these cases, and in those parts of less severe cases in which absences and voids nevertheless figure, becomes the creation of representations that were literally "not there" before. . . ." (p. 493). Stern (2015) continues, *"In this passage and many others, there seems to be a continuity between work on unrepresented states and relational and interpersonal psychoanalytic conceptions of unconsciousness and clinical practice, especially the notion of unformulated experience (Stern 1983, 1997, 2010) [italics added]" (p. 494)*.

Furthermore, Stern (2015) likens the interpersonal, relational processes that allow for the elucidation of unformulated material to Levine's (2015) proposal that representations are created only via "an interactive, intersubjective relationship and process" (pp. 497–498). Here we find the claim shared by both Levine and Stern that mental representations,

[3]See Erreich (2007) for the case of a 4-year-old boy with a postural symptom that represented his capacity to abstract complex relational features from a set of unconscious fantasies that formed the basis of his symptom. Jack's head-tilt symptom represented the embodiment of an unconscious fantasy in early childhood, when language was still a developing medium.

rather than being innate, are "learned" postnatally, via interpersonal processes.

D. B. Stern's (2015) notion of unformulated experience takes the unconscious to be a repository of potential experience that has not yet been articulated:

> In my frame of reference, unconsciousness is understood as potential experience not yet formulated or articulated. Unformulated experience is a vaguely organized, primitive, global, non-ideational, affective state. When it is unconscious for defensive reasons, unformulated experience is understood to have been dissociated, not repressed, which means that it has never been symbolized. (p. 497)

For Stern (1983), unformulated experience consists of "mentation characterized by lack of clarity and differentiation" (p. 71), "vague tendencies which, if allowed to develop to the point at which they could be shaped and articulated, would become this more lucid kind of experience" (p. 72). Stern further clarifies that

> unformulated material is experience which has never been articulated clearly enough to allow application of the traditional defensive operations. One can forget or distort only those experiences which are formed with a certain degree of clarity in the first place. The unformulated has not yet reached the level of differentiation at which terms like memory and distortion are meaningful. (p. 74)

Stern (1983, 2020) cites Sullivan as one source for his thinking on these matters: "Much of that which is ordinarily said to be *repressed* is merely unformulated" (Sullivan, 1940, p. 185). Thus, selective inattention, "not thinking about it," rather than selective exclusion (i.e., repression) is used to "not know" certain material that has never been formulated enough to be banished from consciousness. Notice, however, that both mental processes, not formulating and repressing already represented material, require that the content in question be recognizable as material to be "not formulated" or excluded from consciousness. This necessity puts a heavier burden on models that depend on unformulated or unrepresented mental contents to explain how individuals recognizes material they wish to sequester from consciousness; that is, how can such material be both unrepresented and represented enough to warrant sequestration?

Happily, D. B. Stern (1983) looks beyond the psychoanalytic literature to find support for his proposals, pointing to findings in cognitive psychology to bolster his claims both regarding the possibility of

unformulated experience, and the problem of sequestration of material from consciousness. A view popular in the cognitive psychology literature of the 1960s and 1970s called "constructivism," which grew out of Piagetian ideas regarding cognitive development, held that experience is constructed rather than received as whole cloth. Citing proponents of that view, cognitive psychologists such as Neisser (1967), Erdelyi (1985), and Posner (1973), Stern borrows Neisser's view that unformulated material has decayed before it could become encoded in memory. In considering this work, Stern suggests that lack of formulation of experience serves as a defense, that patients can be motivated to exclude certain types of information from further processing.[4]

As noted above, Stern asks the relevant question regarding defensive unformulation of experience: How can one know what must not be formulated without first formulating it? Citing the work of those cognitive psychologists, Stern (1983) claims that as long as cognition is seen as having multiple constructive layers, only some of which are conscious, the problem disappears, because processing can simply be discontinued at any one of these layers. He concludes that "lack of formulation is lack of symbolization. Not to have a thought means not to translate unformulated experience into language" (p. 91). Notice two important observations regarding this view: First, "unformulated" means "unverbalized" (an equivalence that Stern revises in 2010; see the following discussion). Second, the proposed solution regarding when to discontinue processing for defensive reasons redescribes the problem but does not solve it: How does an individual "choose" to discontinue processing because of the threat of becoming cognizant of unacceptable material without being aware of the unacceptable material? Stern is not alone in having no suitable answer to the conundrum of the operation of unconscious defense.[5]

In 2010, Stern reconceptualized his ideas about what can and cannot be represented. Where he had formerly assumed that only verbal material

[4]These constructivist notions have been superseded by research on the consolidation and reconsolidation of memory (Alberini, Johnson, & Ye, 2013) showing that "findings that a stabilized memory can return to a labile state have changed the way we view long-term memory formation and storage" (p. 81).

[5]Pinker (1997) quotes the linguist Noam Chomsky as proposing that our ignorance can be divided into problems and mysteries. "When we face a problem, we may not know its solution, but we have insight, increasing knowledge, and an inkling of what we are looking for. When we face a mystery, however, we can only stare in wonder and bewilderment, not knowing what an explanation would even look like" (p. 8). So far, the operation of unconscious defense appears to be a mystery.

could be considered as formulated, he now argued that representation was not limited to the verbal register, that both verbal and nonverbal material could be formulated, the former being referred to as "articulation" while the latter nonverbal meanings are referred to as "realization." This reconceptualization allows for the possibility that behavioral enactments and somatic experience can also be considered to be "formulated." Unformulation as a defense against forbidden knowledge remains a primary motivating factor in dissociation. In 2020, Stern wrote,

> Some formulations must simply not be made. These "not-me's" habitually go unformed; they remain unsymbolized. They have no shaped or structural presence in the mind. They are like the white spaces in a painting: they have no actual presence, and yet their absence gives shape to other presences. These white spaces—unformulated experience that, in an ongoing way, is continuously denied formulation *for unconscious defensive reasons* [italics added]—are what I describe as "dissociated experience," and the process by which their formulation is habitually prevented is my understanding of "dissociation." . . . Defense, in other words, is not the banishment of preexisting meaning to a mythical psychic geography, the unconscious, but the unconscious refusal to create those meanings in the first place. (pp. 914–916)[6]

THE ABSENCE OF A DEVELOPMENTAL PERSPECTIVE

D. B. Stern and H. Levine are perhaps the most prominent authors offering us their versions of "unformulated" or "unrepresented" experience. But similar ideas have been taken up by many other analytic theorists, too many to list comprehensively, but some of those writing most recently, especially in the "unrepresented" category, include Diamond (2014, 2015, 2020), Busch (2011, 2016), Bergstein (2016, 2018), Botella and Botella (2005), Sopher (2018), Katz (2016), Vartzopoulos and Beratis (2012), Canestri (2004), and Bohleber et al. (2013). These authors refer to others from past decades who have inspired them, such as Sullivan (1940), Bion (1965, 1970), Green (1975, 1998), and Aisenstein (1993, 2006). However, these authors have not concerned themselves with the

[6]Although Levine's formulations seem to depend on a representational deficiency, Stern's view is equivocal regarding deficit versus defense. Following Sullivan (1953), Stern (1983) describes unformulated material as "experience which has never been articulated clearly enough to allow application of the traditional defensive operations" (p. 74). On the other hand, he also claims that patients can be motivated to exclude certain types of information from further processing for "unconscious defensive reasons" (see the foregoing quotation), leading to dissociation.

question of whether their ideas are compatible with clinical or academic research regarding infant representational capacity.

The proposals of Levine and D. B. Stern, as well as the accounts of the other theorists noted above, lack a coherent developmental perspective, so it is not always clear whether the provenance of the unrepresented and unformulated experiences they refer to is the infant's alone, or whether such states can also arise from adult experiences, though Levine (2020) does refer to "the pre-verbal period of infancy" (p. 11). Perhaps to rectify this deficiency, Levine et al.'s (2013) book contains a chapter by Anzieu-Premmereur on representation in early childhood. Anzieu-Premmereur (2013) claims that young children's fears and behavioral problems reflect "a weakened or absent ability to represent" (p. 240). She proposes that the "formation of mental representations begins as an interactional process that arises from the internal sensations associated with [the baby's] experience with the mother" (p. 242), and *it is this shared experience that is critical for the emergence of the capacity to represent*: "*all of this takes place prior to the organization of the infant's capacity for representation* [italics added]" (p. 246). Once again, we find the assertion that the capacity for mental representation, rather than being an innate human ability, arises postnatally out of an interpersonal matrix.

Anzieu-Premmereur assumes that the child attempts to recreate their experience of being with the mother via Freud's notion of hallucinatory wish fulfillment. One might well wonder why the infant's subjectively experienced hallucinations don't qualify as representations of a missing object. Like others (e.g., Oliner, 2013), Anzieu-Premmereur assumes that hallucinatory wish fulfillment is driven by the search for gratification on the basis of the memory of previous gratification. This view depends on the presence of perceptual hallucinations and the memory capacity to recall instances of previous gratification. It is hard to avoid the conclusion that the capacity for mental representation and its encoding in memory underlies all claims to hallucinatory wish fulfillment. Anzieu-Premmereur (2013) allows for "figuration," the proto-representational process cited by Botella and Botella (2005), despite the problematic nature of that claim, as noted earlier. In keeping with Levine's views, she presents a deficit model of the mind such that, if things go badly in the mother-infant dyad, the infant's capacity for representation is weak or absent, and the infant must resort to defenses such as splitting, projective identification, and dissociation. Again, one is left wondering how these defenses can operate on elements that are supposedly unrepresented in the infant's mind.

Another challenge arises on this account: Mental representations are required for mental activity of any kind; that is, any invocation of an abstract concept (e.g., "democracy") or any allusion to a person, object, or event that is not immediately present (e.g., "the cake I baked last week") requires a capacity for mental representation; one could not navigate reality without this ability. Those who advocate representational deficits as underlying adult psychopathology need to account for the fact that their patients' use of mental representation to stand for external objects and events in their daily lives is unquestionable. What then accounts for the disjunction in this ability such that it is available in all domains except for those pertaining to the patient's emotional life? Such a disjunction seems to beg for a conflict account rather than a deficit account, that is, that adult patients have representational ability but inhibit it for defensive reasons.

THREE REGISTERS FOR REPRESENTATION: ICONIC, INDEXICAL, SYMBOLIC

We must first agree on the meaning of the term *symbolic,* which appears in the work of all these authors. Charles Peirce (1894/1998), a 19th-century philosopher and one of the founders of semiotics, distinguishes among three representational registers for signs, that is, items that stand in for other items: iconic, which have a physical resemblance to the items they stand in for (a picture of a tiger standing in for an actual tiger); indexical, which provide evidence for what is being signified (the footprint of a tiger); and symbolic, which are completely arbitrary and must be culturally acquired (the word *tiger,* which bears no resemblance at all to a tiger).

There is an awkwardness to this taxonomy because we commonly use words such as *represent* and *symbolize* as well as their nominal forms to loosely mean "stand in for." However, notice that when we speak of something being "symbolized" we technically mean "verbalized." And when we observe certain behavioral or somatic instantiations in clinical practice, these too are representational; they are likely to be indexical representations, those that indirectly indicate what they represent, like the footprint of a tiger, or clinically, a child's postural symptom (see Erreich, 2007), or persistent handwashing. Much of the literature on "primitive," "prerepresentational," or "unsymbolized" infantile states exists precisely

because the infant is preverbal and thus is technically presymbolic, as the symbolic register requires words.[7] However, behavioral enactments and somatic experiences are also representational, albeit in an indexical register rather than in words or abstract symbols. Thus, prerepresentational does not equate to presymbolic, because presymbolic is more narrowly defined as pre-verbal. Given the psychophysical facts outlined above and evidence of an innate capacity for representation, there may be no such thing as a "prerepresentational" mental state.

One final clarification: All three registers refer to manifest presentations. That is, whether an individual demonstrates certain behaviors, somatic complaints, or verbal utterances, all refer to manifest events. Manifest representations need to be distinguished from "mental representations," as the latter refer to internal structures of mind at the psychological level (i.e., with no claims as to neurological substrates for now). Proposals regarding infant mentation often conflate Peirce's three registers of representation, as well as the capacity for mental representation with the capacity to make internal representations explicit in somatic, behavioral, or verbal expression.

As noted elsewhere (Erreich, 2015) issues of representation or symbolization have historically been conflated with the verbal/nonverbal distinction and further conflated with conscious/unconscious experience. Freud's formulations regarding "thing" and "word" presentations have promoted the incorrect view that mental representation requires a link to words; hence, experience during the preverbal period could not be representable. Only the verbal can be represented, and only verbal representation can become conscious: "The conscious presentation comprises the presentation of the thing plus the presentation of the word belonging to it, while the unconscious presentations is the presentation of the thing alone" (Freud, 1915, p. 201). Pierce's taxonomy illustrates that mental representation can occur in the iconic as well as the symbolic (verbal) register. We also now understand that preverbal is definitely not prelinguistic. Many aspects of language are innate, while others, like phonemic systems, are acquired from birth onward, long before the onset of verbal expression. Today there is general agreement among academic psychologists that mental activity of any kind is impossible without mental representation.

[7]Given Pierce's taxonomy, notice that mental imagery of the sort found in dreams or ordinary waking life is also technically not "symbolic"; because mental imagery bears a physical resemblance to the item it stands in for, such images are considered "iconic" or "indexical" rather than "symbolic," as the symbolic register requires verbal representation.

THE CORRECTIVE FUNCTION OF DATA FROM OTHER DISCIPLINES

Given the reach of the belief in "primordial and unrepresented" mental states noted by the Vancouver Congress organizers, one would expect some evidence to support it. To repeat, the frame of reference of this investigation is that claims regarding the capacity for mental representation require a consideration of findings in developmental psychology regarding that ability. Many creative variations on "primitive," "unformulated," and "unrepresented" states have been offered without any such consideration, leading to dubious conclusions. It is impossible to refute every such individual claim, but a review of relevant research will provide evidence that *the infant's mind demonstrates an innate and rather sophisticated capacity for the veridical perception and representation of subjective experience, and the ability to encode such experience in memory, even before birth*. In the face of such evidence, the infant's mind would appear to be neither primitive nor prerepresentational.

Clinical psychoanalysts and academic researchers alike are faced with the same epistemological problem: How can we know the subjective mental states of others, infants or adults, when all we have access to is their manifest behavior, including verbal behavior?[8] The parallel nature of this challenge to both groups was ignored in Andre Green's comments in a now rather infamous debate with Daniel Stern regarding the relevance of infant research to psychoanalysis (Green, 2000; D.N. Stern 2000). Green (2000) insisted that infant observations are inherently irrelevant for a psychoanalysis whose focus is, instead, on idiosyncratic personal meanings and hidden motives: "observation cannot tell us anything about intrapsychic processes that truly characterize the subject's experience" (p. 60), and "in the clinical setting language is an invaluable source of information" (p. 61). Green trumpets his choice of the dream over the baby, though he does not make clear why one must choose. The publication of the Green-Stern debate spawned a series of commentaries in this journal (Volume 44, 1996), as well as a succession of letters (Volume 46, 1998) responding to a paper by Wolff (1996), whose views were similar to Green's arguments.

[8]An analyst's use of projective identification as a source of data regarding the internal state of another might be thought to contradict this observation. Controversy regarding the validity and reliability of projective identification as a source of data regarding the mental state of another is beyond the scope of the current investigation, but the claim can hardly be taken at face value.

There is no need to rehearse the many substantive objections raised in those publications, except to note the obvious ones, all related to Green's seemingly exclusive emphasis on words as carriers of meaning.

First, in this debate, Green seems to dismiss the value of patient enactments. Second, Green's line of argumentation ignores the work of child analysts, those working with preverbal or barely verbal young children, as this work relies mostly on their patients' nonverbal representation of meaning. Third, Peirce's notion of the symbolic register allows for an inherent "slipperiness" in the arbitrary linkage between a symbol or word and the item it stands in for (Mitchell Wilson, personal communication). Thus, few analysts take their patients' words at face value. Given patients' defensive denials and distortions, our collegial debates are filled with disagreements about what a patient's words "really" mean precisely because they cannot be taken at face value.

D. N. Stern's (2000) response to Green was to agree that though infant observation is not directly relevant to psychoanalysis, it is nevertheless indirectly relevant via the notion of plausibility; that is, certain psychoanalytic formulations may not be plausible given what is known about infant mentation and development:

> Plausibility can place considerable doubts or constraints on what is an acceptable psychoanalytic notion, be it theoretical or clinical. These doubts are not the result of a direct challenge. As Ricoeur (1977) points out, plausibility is the point at which the hermeneutic circle of psychoanalysis must open and make contact with other domains of knowledge or speculation—in this case, infant development. . . . A broad intellectual interest in psychoanalysis ultimately rests on this pillar of its relationship and fit with the rest of our current world knowledge. When this relatedness is broken or becomes too weakened, the psychoanalytic discourse stops being interesting and gets left behind—not because it is wrong or right, but because it has lost contact and import for the rest of the intellectual culture. For instance, the existence of a "normal autistic phase" is simply not plausible in light of the findings of infant observation (p. 75).

Clarke (2017) has written that "most everyone agrees that psychoanalysis is not, and should not strive to imitate, a natural science in the strict sense" (p. 576). However, he suggests that most contemporary writers, in speaking of "psychoanalytic science," intend it to be

> an objective form of reasoned inquiry that is epistemologically compatible with empirical research and perhaps other, more traditional branches of science, such as

> neuroscience. This is also consistent with the contemporary philosophy-of-science appreciation of the interpretive and contextual dimension of scientific inquiry. Science is more than measurement and calculations of physical forces. (p. 576)

Clarke cites Mayes's (2005) claim that psychoanalysis and developmental psychology have different but not incompatible epistemologies; the idiographic methodology of psychoanalysis is not incompatible with the nomothetic methodology of developmental science. Recognizing both the similarities and the differences would help bring psychoanalysis "into active discourse and collaboration with contemporary developmental, social, and brain sciences" (Mayes, 2005, p. 148, quoted in Clarke, 2017, p. 593).

By maintaining its isolation outside of universities and scholarly discourse, in accordance with Freud's original sin, psychoanalysis has lost the kind of easy, quotidian access to data from ancillary fields, as well as the rigorous habits of mind that characterize academic thought (Erreich, 2018). Interdisciplinary thinking is expected to counter the effects of isolated information silos and epistemological solipsism. Louis Menand, academic, critic, and essayist, notes the complaints of university professors in great-books courses, in which the focus is on primary texts and students' experiences of them, rather than on scholarly writing, objectivity, and rigorous thinking. Menand (2021) bemoans the straitened thinking of these university-based humanists; his comments could equally apply to certain schools of psychoanalytic thinking:

> Humanists cannot win a war against science. They should not be fighting a war against science. They should be defending their role in the knowledge business, not standing aloof in the name of unspecified and unspecifiable higher things. They need to connect with disciplines outside the humanities, to get out of their silos. Art and literature have cognitive value. They are records of the ways human beings have made sense of experience. They tell us something about the world. But they are not privileged records. A class in social psychology can be as revelatory and inspiring as a class on the novel. The idea that students develop a greater capacity for empathy by reading books in literature classes about people who never existed than they can by taking classes in fields that study actual human behavior does not make a lot of sense. (p. 68)

The corrective function of data from other disciplines is illustrated by Freud's erroneous supposition that infant mentation mainly consists of hallucinatory wish fulfillment until the infant recognizes its futility and

reluctantly turns to reality for satisfaction of its needs. As noted earlier, this view of infancy is still held by many (e.g., Anzieu-Premmereur, 2013; Oliner, 2013). All the developmental literature of the past 60 years has demonstrated just the opposite: the infant is, in fact, highly reality oriented from birth, even prenatally, a finding that makes evolutionary sense in a way that a hallucinating infant mind does not; that is, a hallucinating infant mind is no more plausible than a "normal autistic phase" in infancy:

> Under the weight of the current evidence, constructs like normal autism, normal symbiosis, primary narcissism, fusion, hallucinatory omnipotence, and other inaccurate depictions of infancy surely must give way. The theory of hallucinatory wish fulfillment, as Bleuler and Vygotsky knew, seems especially implausible, if only because an organism that normally functioned in this manner would be incapable of survival. Indeed, it is difficult to imagine attributing to other species, as a piece of normal development, an infantile stage in which hallucination is a response to frustration. (Auerbach, 1993, p. 69)

In more recent history, the work of Kanner (1943) and Bettelheim (1967) led psychoanalysts to assume that autistic children's deficits were due to environmental deficiencies in mothering, so-called "refrigerator mothers." This was a standard psychoanalytic belief despite the fact that research in developmental psycholinguistics had long demonstrated that language acquisition, the absence of which was an important diagnostic criterion for autism, was a universal, brain-based, critical period phenomenon in all children. The innate basis for language competence was demonstrated by many findings, most obviously the universal observation that the syntactic and phonological fundamentals of one's native language are fully in place by ages 3 to 4, within a wide range of intelligence, cultural customs, and parenting styles. This observation should have led analysts to conclude that the absence of language plausibly reflected a neurological deficit, not an environmental one. It is unnecessarily narrow and rigid to assert that, when it comes to models of mind and development, only data from the consulting room are relevant to psychoanalytic thinking.

THE COMPETENT INFANT

As noted earlier, it is unclear what the provenance of "unrepresented" and "unformulated" experience is; that is, do writers such as H. Levine and D. B. Stern intend for such experience to arise out of the preverbal

dyad only, or can its source be a traumatic event during adulthood?[9] In either case, *evidence regarding the infant's capacity for the representation and encoding of subjective experience in memory provides the strong form of the argument against the existence of "unrepresented" or "unformulated" experience as the primary pathogenic factor in adults, that is, the argument that adult pathology relates directly to deficits in representational capacity*. Thus, findings regarding the infant's capacity to represent and encode experience in memory are critical to an evaluation of these deficit hypotheses as they apply to patients of any age.

Notice that several abilities are in play regarding this capacity to represent. These include an ability for acute perceptual discrimination in all modalities, the capacity to represent that experience in or out of awareness, and finally, the ability to encode such experience in memory. Infant deficiencies in any one of these abilities would render more plausible those deficit accounts that depend on weak or absent representational capacity, while robust infant capacities in these mental processes would render deficit accounts implausible, suggesting that individuals can discriminate, represent, and memorialize subjective experience from infancy onward but "choose" not to for defensive purposes. *Thus, the critical question is, how early are children able to discriminate, represent, and encode subjective experience?*

The 1960s and 1970s became known as the era of the "competent infant" (Stone, Smith, & Murphy, 1978). Coming on the heels of Piaget's research into the mind of the child, aided and abetted by the advent of video camera technology and the "habituation paradigm,"[10] findings in developmental psychology have confirmed and reconfirmed the notion that infants have a high degree of perceptual acuity in all modalities, and a likely inborn

[9]Some analysts would argue that for an adult experience to be experienced as traumatic, it would necessarily have early childhood antecedents. This psychoanalytic assumption, and the role it played in the awarding of reparation payments to Holocaust survivors, took on surprising significance in the postwar restitution claims made by Holocaust survivors (Herzog, 2017).

[10]Habituation is a common experimental paradigm used to demonstrate the cognitive abilities of infants and young children. *Habituation* refers to the gradual decrease in the infant's interest in a novel stimulus because of its repeated presentations. For example, the baby is presented a stimulus until its interest for the stimulus declines, that is, that the infant looks at the stimulus for less and less time: this is the habituation phase. The infant is then presented with another stimulus. If the infant perceives the second stimulus as identical to the first, it shows little interest in it. If the infant perceives the second stimulus as novel, the infant's looking time increases. In addition to looking time, heart rate has also been used to measure the perception of novelty. This paradigm can be employed to study perceptual discrimination in all perceptual modalities and even across different modalities.

capacity for the representation and encoding of subjective experience in memory. Contrary to the views of both Freud and Klein, the infant is highly reality oriented, pre- and postnatally, acquiring both procedural and declarative knowledge regarding the social and material world, organizing their experience in accordance with properties such as place, directionality, intensity, rhythm, agency, and intentionality (Carey, 2009).

The past six decades of research in academic developmental psychology have resulted in systematic, empirically based research on infants' mental representations of self, others, and interpersonal relationships. These representations are "multifaceted, sometimes contradictory, and frequently unconscious, and they occupy a central position in the human psyche, as regulators of affect, cognition and behavior" (Shahar, Cross, & Henrich, 2004, p. 272). As early as 30 years ago, infants' real-world capacities were thus summarized by Auerbach (1993):

> Infants are born with, and develop in the first year of life, remarkable capacities for learning about and becoming involved with the world around them, especially the human world. Although they come into the world with . . . rudimentary awareness of the difference between self and others, newborns are, nonetheless, designed to start elaborating this distinction from very early on. There is no developmental period in which infants are unaware of their surroundings or uninterested in establishing bonds with their caregivers. (p. 68)

In a more contemporaneous review of inborn infant abilities, Dehaene (2020) opines

> The fact that newborn babies immediately exhibit sophisticated knowledge of objects, numbers, people, and languages refutes the hypothesis that their brains are nothing but blank slates, sponges that absorb whatever the environment imposes on them. . . . It was only with the advent of sophisticated magnetic resonance imaging (MRI) methods that we were finally able to visualize the early organization of the human brain and discover that, in agreement with our expectations, virtually all the circuits of the adult brain are already present in that of a newborn baby. (pp. 93–94)

And furthermore,

> As early as a few months of age, a baby already knows that the world is made up of objects that move coherently, occupy space, do not vanish without reason, and cannot be in two different places at the same time. In a sense, babies' brains already know the laws of physics. . . . How do we know this? Because babies act surprised in certain experimental situations that violate the laws of physics.

> . . . They already possess deep intuitions of the physical world and, like all of us, are stunned when their expectations turn out to be false. (p. 78)

The abundant research findings that substantiate these conclusions over the past 60 years would require a book-length review. I will attempt only a brief sampling of this research, hopefully enough to provide a sense of the scope of this massive project, whose goal has been to account for infant mentation. Given the infant's competencies, we must then ask whether it is plausible to hold that representational deficiencies are at the heart of serious adult psychopathology.

The Infant's Capacity for Perceptual Discrimination in All Modalities

Recall that Mahler (1972) had claimed that the all-important ability to differentiate self from other, and inner from outer reality, took about 36 months to accomplish. Daniel Stern (1985) concluded that the abundant research findings regarding infants' accurate and sophisticated perceptual abilities rendered Mahler's account highly implausible. The presence of undifferentiated or symbiotic states represented neither normal infant mentation nor a deficit in the ability to move from merger to separation; rather, such states represented motivated ways of being-with-an-other (Stern, 1982).

As noted earlier, developmental research since the 1970s has consistently demonstrated the infant's robust perceptual discrimination capacities in all modalities, and across modalities. In the case of visual perception, 50 years ago, Bond (1972) concluded that infant perception is qualitatively similar to that of the adult. Much of the research on visual discrimination has focused on face perception; those findings have consistently revealed evidence of an inborn preference for the iconic human facial schema (Mondloch et al., 1999), including infants who are 9 minutes old and have not yet seen a human face (Goren, Sarty, & Wu, 1975). Preference for the face schema has very recently been shown to exist even prenatally (Reid et al., 2017).[11] Infants as young as 2 days can imitate an adult's affective facial expressions, and by 4 months, they can even

[11]Reid et al. (2017) demonstrated via sonography during the third trimester of mothers' pregnancies that the human fetus "swims" toward three lights ("dots") configured like a face schema (two lights on top, one light centered below them) rather than the same configuration but inverted so that the two "dots" are on the bottom. The fact that postnatal experience of faces is not required for this preference indicates that this is an innate predisposition.

discriminate among facial expressions of anger, fear, and surprise (Serrano, Iglesias, & Loeches, 1992; Field et al., 1982).

Auditory discrimination is equally acute in infants. Evidence of differential sensitivity to the mother's voice occurs very early in life (DeCasper & Fifer, 1980), even prenatally.[12] Moon, Cooper, and Fifer (1993) showed that 2-day-old infants of monolingual English and Spanish speakers demonstrated a preference for their native language by sucking harder to activate it, likely because of the prenatal experience of their mother's voice and language, and there is converging evidence for fetal retention of auditory experience into early postnatal life (Moon & Fifer, 2000).

Infants are also able to coordinate events across perceptual modalities. They can correlate light intensity with sound intensity (Lewkowicz & Turkewitz, 1980), they can visually identify a nipple they had sucked while blindfolded (Meltzoff & Borton, 1979), and they can imitate the face and hand gestures of adult models (Meltzoff & Moore, 1977, 1983). Finally, when infants view video of their mothers speaking with their voices delayed by 0.05 seconds, they clearly notice the discrepancy between the visual and auditory modalities and show signs of being disturbed by it (Dodd, 1979).

Contrary to long-held psychoanalytic beliefs, infants are highly reality oriented from birth; they are predesigned to discriminate between self and other, and inner and outer reality, from the earliest days of life. As many have noticed, as people and events in the social and physical world provide perceptual stimuli in multiple modalities, visual, auditory, olfactory, tactile, kinesthetic, the child is able to combine the multiplicity of perceptual stimuli into an accurate representation of the physical and social surround. It then becomes implausible to hold that the ability to distinguish between self and mother requires 30 to 36 months in accordance with Mahler's now dubious claims. Rather than signaling a regression to an early undifferentiated state, symbiotic and self-object fantasies appearing in either children or adults indicate postnatal adaptive or maladaptive developmental constructions (i.e., defensive maneuvers).

[12]DeCasper and Fifer (1980) demonstrated newborns' acute auditory discrimination abilities using a nonnutritive nipple. By sucking on this nipple in different ways, a newborn human could produce either its mother's voice or the voice of another female. Infants learned how to produce the mother's voice and produced it more often than the other female voice.

The Capacity for Mental Representation Is Likely Innate in Humans (and Animals)

As far back as 1970, during the height of the "cognitive revolution," Beres and Joseph (1970) noticed the increased importance of the mental representation construct and bemoaned the absence of sufficient systematic studies, an absence that would soon be rectified. They noted that mental representations are referred to by many different psychoanalytic terms, including "word-presentations, thing-presentations, self-representation, object-representation, object constancy, introjected object, internal object, representational world, body image, memory schema, instinctual representative, psychical representation, mnemonic trace" (p. 1). Quite correctly, and contra models of unformulated, unrepresented experience, they wrote, "We assume that in the human all mental registrations are transformed into mental representations and, as such, may be evoked as conscious derivatives in the absence of a direct stimulus" (p. 2).

In support of Beres and Joseph's (1970) assertion, Carey (2009) concludes that our capacity for mental representation, like the ability to make perceptual discriminations, is unlikely to be "learnable" but is rather a component of our genetic endowment.[13] One of Carey's arguments in support of this innateness hypothesis is that nonhuman primates spontaneously represent their worlds in terms of the same systems of core cognition that underlie infants' representations of their world: "To the extent that systems of representation are shared with nonhuman primates, it is unlikely that they were culturally constructed by human beings, drawing on human specific symbolic capacities" (p. 457).

In this regard, Hofer (2014), reviewing animal research on the attachment bond and its relation to the human mother-infant bond, takes a similar view regarding the early capacity for mental representation for an even less evolved species such as the rat:

> We discovered that, even in a far less evolved species, the infant's "bond" consists of a set of memories and presumed associated feeling states, laid down through specific interactions with its mother. These can be viewed as constituting a simple mental representation of the sensations, contingencies, physiological/emotional states and actions previously experienced. Thus, it is highly likely that a human baby, and even a fetus learning to recognize its own mother's voice . . . also starts to form internal object representation very early, and in a roughly similar way: through associative learning processes. (p. 15)

[13]For Carey, *innate* may mean present at birth, or it may mean representational capacities that emerge from maturational processes, such as stereoscopic representations of depth, which emerge at about 6 months of age.

Hofer finds evidence for early representational capacity in rat pups, especially for aspects related to the regulatory function of caretakers, and he argues that these are incorporated into higher level mental representations. Notice that Hofer's finding of the capacity for mental representation in other mammals supports Carey's argument regarding mental representation as an innate capacity in human infants.

Clearly, it is infants' innate capacities for perceptual discrimination and representation that make them such early and rapid learners (Sommerville, Upshaw, & Loucks, 2012). This powerful genetic heritage makes it possible for humans to acquire complex knowledge systems without being aware of either the acquisition process or the product of that learning. The acquisition of one's native tongue is perhaps the best example of our innate "core cognition," as children manage, by ages 3 to 4, to acquire the basic phonological and syntactic rules of their language without conscious awareness or instruction. When compared with the long, difficult process of second-language acquisition, the ease and speed of first-language acquisition illustrates the power and sophistication of infants' innate representational and computational capacities which operate during the critical period for first-language acquisition (Erreich, 1984, Erreich, Valian, & Winzemer, 1980; Valian, Winzemer, & Erreich, 1981). When it comes to language learning, infants are astonishingly competent.

The number and variety of systematic studies of mental representation in infants has exploded since the time of Beres and Joseph (1970). In 1999, Lyons-Ruth introduced the term *enactive representation,* by which she intended to preserve the affective and spatiotemporal contingencies in the infant's environment:

> This [enactive representation] is not to contend that translating enactive knowledge into words may not be an important therapeutic tool or developmental step; it *is* to contend that development does not proceed only or primarily by moving from procedural coding to symbolic coding (*or* from primary to secondary process *or* from *pre*verbal to verbal forms to thought). Procedural forms of representation are not infantile but are intrinsic to human cognition at all ages and underlie many forms of skilled action, including intimate social interaction. . . . Rather, I would argue that procedural systems of relational knowing develop in parallel with symbolic systems, as separate systems with separate governing principles. (pp. 579–580)[14]

[14]Lyons-Ruth was arguing against comments such as this from Diamond (2020): "because early-life trauma is often encoded in *the body-mind system before becoming verbally signified* [italics added], the associated memories are frequently not stored in the episodic memory system and instead remain in an *earlier, more primitive memory form* [italics added]" (p. 854).

Once again, it would require a hefty tome to catalogue all the empirical research on innate or early representational capacities in infants; only the spirit of those findings can be presented here. Kellman and Spelke (1983) demonstrate that perception of objects may depend on an innate conception of what an object is, an innate concept, in Carey's (2009) terms. Johnson, Dweck, and Chen (2007) found robust evidence that 12- to 16-month-old infants' own attachment experiences are reflected in abstract mental representations of social interactions. More recently, Kabdebon and Dehaene-Lambertz (2019) claimed that their findings "buttress the hypothesis of symbolic representations in preverbal infants, which may serve as a foundation for our distinctively human learning abilities" (p. 5805). In sum, contemporary developmental psychology views mind as comprised of constellations of mental representations, and it is assumed that the capacity for representing states of mind is inborn, with certain "core" mental representations (e.g., the face schema, the notion of an "object") also likely to be innate.

Evidence for Pre- and Postnatal Encoding of Subjective Experience in Memory

For purposes of psychoanalytic theorizing, we would want to know how early in life children are able to encode events in memory. There exists a vast number of research articles regarding infant memory, but despite many unresolved questions, a broad-brush view of this topic is sufficient to demonstrate the presence of a robust memory system in infants. The following studies, both clinical and experimental, are reflective of what is already known in this domain.

Of course, anecdotal evidence for encoding and recall of visual and auditory stimuli appears early in the simple act of the infant's recognition of its mother's face and voice. Clinical evidence for episodic memory of traumatic events is provided by Gaensbauer's (2004) report of a young man who, when stressed as an adult, felt that his heels hurt. He had been completely unaware that he had had repeated painful heel pricks when he was a neonate, providing evidence that even the earliest trauma can be represented and reexperienced years later.

Terr (1988) studied the verbal and behavioral memories of 20 children who suffered psychic trauma before age 5. These memories were compared with documentation of the same events. Terr concludes that behavioral enactments of traumatic memories remain quite accurate and true to the events that stimulated them. She insists that although preverbal

children may be unable to describe a traumatic event in words, they are able to accurately enact it in play or in somatic responses. Clearly, this ability requires a preverbal capacity to represent traumatic events in memory, a conclusion also shared by Coates (2016), for all three children she presents.

Gaensbauer (1995) also reports on traumatic events experienced by five children aged 7 to 15 months. His case reports demonstrate that when provided with opportunities for nonverbal expression, young children indicate that salient sensory and somatically based elements of a preverbal traumatic experience have been encoded and retained in memory over extended periods of time. The children's enactments

> were not simply visual or photographic images of a fragment of the experience. Rather, within the bounds of the children's capacities to perceive, the representations appeared to involve multiple sensory modalities (visual, auditory, tactile, kinesthetic, and vestibular), a sense of temporal sequence, and compelling affective meaning. . . . At the same time, the memory capacities exhibited did not appear to be completely encompassed within the boundaries of implicit memory but had characteristics associated with explicit, or declarative, memory as well. . . . The purposeful way in which the children engaged in the play reenactments conveyed the strong impression that they were communicating what they felt had happened to them personally. In addition, in the children's communications, there did not appear to be an absolute disjuncture between nonverbal and verbal modes. As words became available, each of the children was able to superimpose verbal description on the nonverbal representations in ways which facilitated understanding and communication of the experience. (p. 143)

Gaensbauer argues against the presumption that such experiences are prerepresentational or out of conscious awareness:

> The children appeared not only able to develop internal representations of their traumas, but seemed capable of transforming and expressing these representations in symbolic terms. The dreams, play enactments, drawings, and thematic preoccupations of the children for whom follow-up material was available gave evidence of carryover of specific aspects of their traumas into metaphorical and symbolic forms. (p. 146)

Gaensbauer proposes that the cases he presents indicate that the mental representation of traumatic events is present as early as 6 months and does not depend on expressive language, and he correctly notes that our knowledge regarding the degree of representational capacity available

during infancy would enable us to better understand the mechanisms on which long-term effects of early trauma depend.[15]

Gaensbauer (1995) suggests that early traumatic events in infancy lead to "the massive overconsolidation of stress-responsive neurohormones and neuroregulators . . . resulting in an overconsolidation of memory traces, a kind of 'superconditioning'" (p. 144). This view of infant memory, which posits an "overconditioning of memory traces" (Gaensbauer, 1995), contradicts proposals which hold that early traumatic experiences remain "unformulated" or "unrepresented."

A stunning example of the encoding of a discrete traumatic event in a young infant's memory was presented by Bernstein and Blacher (1967). Laura was born with hydrocephalus, which required several painful surgical procedures at 3 months. The hospital was undergoing renovation, resulting in constant loud banging during her pneumoencephalographic examination; Laura awoke screaming and terrified. At 28 months, Laura became terrified at the sound of hammering from next door and would awaken frightened from naps. She explained "man is knocking . . . in the hospital the man knocked my head off," reminding her mother about the construction work during her procedure. When questioned further, Laura responded "man stuck me in the tushie and knocked my head off," indicating that the procedures had hurt her head. This case provides evidence of the encoding of a discrete traumatic experience in declarative memory at 3 months of age, and the priming effect of sounds that accompanied the child's surgery (Erreich, 2017).

In a somewhat novel view of infants forgetting more neutral events, Rovee-Collier and Cuevas (2009) argue that the mechanism underlying young infants' extensive learning and memory allows them to perceive more aspects of an event than adults do. Experience within the infant's culture narrows, shapes, and prunes their initially broad perceptual tuning. Because infants learn and remember too much, a pruning of useless associations is necessary, along with rapid forgetting in the absence of

[15]Academic research on infant memory is entirely in support of these clinical findings. Alberini and Travaglia (2017), considering the existence of critical periods for hippocampal development in rats and human infants, conclude that the hippocampus and hippocampal learning system are highly engaged in the processing of early experiences and the encoding of infantile memories, allowing for the infant's capacity for long-lasting encoding of experience early in life which influences lifelong behavior. Callaghan and Richardson (2012) reinforce this finding in their experiments with rat pups. They find that infant adversity leads to an early transition into adultlike fear retention, thus allowing infant memories to have a long-lasting influence.

repetition for those events, thus making room for more learning and memory.

The following represents only a meager sampling of the very many experimental studies on pre- and postnatal memory. Such studies generally partial out infants' abilities with respect to individual perceptual elements or modalities; of course, in real-life situations, these are combined in the infant's experience of the physical and social world. There is evidence for what appears to be prenatal memory as demonstrated by the finding that newborns are able to recognize a Dr. Seuss story when it is read to them by their mothers in the third trimester of pregnancy, and they prefer hearing their mother's voice to that of another woman (DeCasper & Fifer, 1980); they are also able to differentiate between passages from two different Dr. Seuss books (DeCasper & Spence, 1986).

One-month-old infants can perform cross-modal matching tasks by looking longer at an object they had mouthed while blindfolded than one with which they had no tactile experience, indicating cross-modal perceptual encoding in memory (Meltzoff & Moore, 1985). Infants less than 2 months old can remember specific objects in a training mobile for up to 24 hours (Hayne et al., 1986), and 2- to 3-month-old infants can recall for 24 hours aspects of an event they'd witnessed for only a few minutes (Super, 1972), while Perris, Myers, and Clifton (1990) have demonstrated that children exposed to an experiment at 6 months showed evidence of having retained the information concerning it at follow-up 2 years later. Finally, the behavior of avoidantly attached children in the Strange Situation provides evidence for the encoding of cumulative defects in maternal attunement and empathy in procedural memory from the beginning of life, and its later recall at 12 months (Erreich, 2017).

Despite the piecemeal nature of experimental studies, the clinical observations noted earlier of Bernstein and Blacher (1967), Terr (1988), and Gaensbauer (1995, 2004), and the behavior of avoidantly attached children, provide evidence that these individual perceptual elements have already been combined into rather detailed narratives as early as 3 months and elaborate unconscious fantasies certainly by 12 months (Erreich, 2003).

More than 30 years ago, Meltzoff (1990) concluded that "there is a kernel of some higher-level memory system right from the earliest phases of human infancy" (p. 25). Rovee-Collier (1997, 1999), who revised our understanding of infant memory via many ingenious studies of babies

recalling their visual, auditory, and motor experiences, similarly argues that both implicit and explicit memory operate from very early in development, and the same mechanisms appear to underlie memory processing in infants and adults.[16] Psychoanalytic researchers and practitioners have demonstrated that preverbal memory exists for both procedural and declarative experience, and that such memories can be represented via bodily sensations and behavioral enactments as well as expressive language.

WHAT IS TO BE DONE?

How should we psychoanalysts think about these findings from both clinical and academic researchers regarding representational capacity and memory in infants?

Given these findings, what sorts of plausible conclusions can we draw? Extraclinical data have generally been disregarded by authors who write of unrepresented or unformulated experience; is there other evidence to support the plausibility of their claims? The current view of the "competent infant," one with highly accurate perceptual discrimination capacities and an innate ability to represent subjective experience in both procedural and declarative memory, appears to pose a significant challenge to psychoanalytic theories that espouse "primitive mental states" (e.g., Caper, 1998; Grotstein, 1980; Klein, 1946/1975; Ogden, 1989) or "unrepresented," "unformulated," "unsymbolized" experience (e.g., Levine, 2012, 2020, 2021; Levine et al., 2013; Stern, 1983, 2010, 2015, 2020), or "nonconscious" states (Pally, 2007). Rather, both research and clinical findings related to the mental capacities of preverbal and even prenatal infants indicate that the presence of fantasies of split or merged objects, "empty" minds, or other distortions of subjective and objective reality, are defensively motivated, and arise as the result of toxic parenting experiences postnatally. "It seems fair to say that there is a burden on theories that claim the existence of such states to specify their nature in a

[16]Some authors have assumed that autobiographical memory, that portion of episodic memory that links a memory to a specific time and place, is the last memory system to develop (Nelson & Fivush, 2004). Academic researchers tend to rely on verbal, nomothetic data; they have no access to idiographic clinical data that allow for behavioral enactments and somatic representations of implicit or procedural ways of being with others, as well as explicit traumatic events as cited by clinical researchers such as Gaensbauer (1995), Coates (2016), and others (Erreich, 2003).

manner that does not violate our growing knowledge of infants' mental capacities" (Erreich, 2017).

Others have taken a similar view. As early as 1985, D. N. Stern argued that neurotypical preverbal infants perceive the world accurately. For example, neurotypical infants do not distort reality in a manner that suggests fantasies of omnipotence. As Stern (1985) notes, even the use of a transitional object depends on representational capacity. Rizzolo (2017) argues against the existence of primitive mental states, insisting that Freud's "primary" processes and Klein's "primitive" defenses are neither evolutionarily nor developmentally primitive. He proposes that psychoanalysis discard the concept of primitivity because so-called primitive operations (e.g., hallucinatory wish fulfillment, condensation, splitting, projective identification) are not infantile but rather conceptually sophisticated and thus develop across the life span.

Echoing Gaensbauer's (1995) and Terr's (1988) similar observations, Oliner (2013) objects to the understanding of traumatic events as nonrepresented mental states because of "the amazing accuracy of the enactments and actualizations of the calamitous events otherwise not available to consciousness" (pp. 152–153). Oliner argues that this continuity is itself proof of the existence of representation in memory.

In other words, this rich view of infant mentation plausibly suggests that the apparent absence of memory or the inability to formulate subjective experience is not due to a deficit in representational capacity. This investigation cannot adequately address the larger conflict-deficit dilemma. However, a true deficit in the capacity for mental representation should apply across all domains of an individual's functioning, yet patients who are said to have such deficits do manage to function in the world, a feat that would be impossible without the capacity for mental representation. If this so-called deficit applies only to the realm of certain emotional experiences, one might plausibly suggest that some dynamic conflict has mobilized a defensive inhibition.

What is the relationship between infants' innate ability to represent and recall subjective experience and the sorts of phenomena that are of greatest interest to psychoanalysts, such as dreams and fantasies (conscious and unconscious)? And what role does the environment play in this process? Recall that the evidence strongly suggests that infants and very young children accurately represent and recall meaningful, sometimes traumatic, subjective experience (Bernstein & Blacher,1967; Gaensbauer,

1995; Terr, 1988); their enactments belie the notion of rudimentary forms of representation.

The research I have presented suggests a view of development that is opposite to what has been the traditional one in psychoanalytic theorizing. That view holds that infant mentation is innately "primitive" in a variety of ways: it is "prerepresentational," "unsymbolized," or filled with perceptual and conceptual distortions due to splits, mergers, or paranoid-schizoid ideation. But experimental findings suggest that the infant's innate perceptual, representational, and memory capacities render them highly accurate perceivers of reality, especially social reality, a view that makes more evolutionary sense. This alternative view suggests that early perception and representation of subjective experience is accurate ("veridical perception"; Erreich, 2003) but that distortions quickly arise out of the demands and prohibitions of the social environment, as illustrated at 12 months by the defensive behavior of avoidantly attached children (Erreich, 2003). That is, as early veridical representations of subjective experience are elaborated and superimposed on one another over the course of development, those elaborations, manifest as fantasies (conscious and unconscious)[17] and dreams, begin to include conflicted and defensive content and processes, including various defensive mechanisms (splitting, denial, merger, etc.). What began as veridical perception can become highly distorted in a traumatizing mother-infant dyad. Again, this is the reverse of the usual psychoanalytic view: that is, representation of subjective experience is innately accurate but becomes increasingly distorted and overlaid with protective "revisions" as an infant is gradually immersed in the demands of the social environment, and struggles to develop safe, stable attachments to important figures. Note that what develops is not the capacity for mental representation of subjective experience, but the content of the representations that a child generates as a result of particular environmental experiences.

Fonagy (1991) seems to support this view when he writes that the child's awareness of the malevolence of the caregiver is so painful that they begin to inhibit their ability to reflect on the accurately perceived mental states of the other, and even the self, resulting in unintegrated and inconsistent representations of important early relationships. This theme is reprised by Fonagy, Luyten, and Allison (2015) in the notion that the

[17]See Erreich (2015) regarding the relationship between mental representations and unconscious fantasies.

mentalizing difficulties characteristic of patients with borderline personality disorder may be viewed not as a deficit, but as a useful adaptation given the toxicity of their experience in the maternal dyad, that is, as a compromise solution to unbearable conflict.

A related position is taken by Eagle, Wolitzky, and Wakefield (2001) regarding unformulated experience:

> what needs to be spelled out are not inchoate, completely ambiguous experiences but identifiable mental contents. . . . For defensive reasons, these contents are left vague, unarticulated, and not attended to. But, and this is the crucial point, in spelling them out one does not entirely *create* them. Rather, one uncovers and articulates them. To put it another way, the notion of spelling out in these examples makes sense only if one holds on to the idea that accurate spelling out makes reference to existing mental contents—that is, tallies with something real in the patient. (pp. 471–472)

In fact, Eagle et al. cite an example from Green (1986) regarding the meaning of a trauma experienced in a preverbal child. Green appears to agree with these authors that although the potential meaning of the trauma may be realizable only in the analytic situation, it is nevertheless the case that "the analytic situation reveals it, it does not create it" (p. 293; quoted in Eagle et al., 2001, p. 472).

Even Diamond (2020), citing Gaensbauer's (1995) cases, admits to the notion that "even preverbal traumas are often capable of being remembered in both procedural (implicit) and declarative (explicit) memory systems, as for instance through an analytic process" (p. 847, fn. 3).

Finally, Blass (2016) writes most eloquently about the importance of behavioral and somatic representation. She notes that Klein's notion of phantasy does not entail a distinction between becoming aware of split-off or denied truths and developing the capacity to think. Klein's understanding of phantasy belies proposals which claim that past analysts were concerned with the former before only recently moving on to the latter:

> In Freud's notion that denied truth finds expression in symptoms, truth is portrayed as motivated, driven. It seeks to be known. . . . The capacity to know, like the truths to be known, are given, available to the individual but in a conflicted way. The patient is driven to know but also does not want to know. To change this is not to uncover truths, nor is it to symbolize what was never known or to learn how to apply symbolization, mentalization, or some other such capacity. Rather, it is to interpret the conflicted dynamic meanings, the underlying

> motives that stand in the way of knowing, that prevent seeing reality as it is and living in it fully. (Blass, 2016, pp. 309, 314)

Blass cites Greenberg's (2016) comments regarding some contemporary psychoanalysts' views that what is unknown was never known and could not be known because of developmental limitations on representational capacity:

> If this is indeed the change implied, it is a very dramatic one. Not only does truth become irrelevant to psychoanalysis, but rather very little of the traditional Freudian-Kleinian perspective I have described remains relevant. The person's dynamic struggle with his meaningful inner world, which he both wants to know and does not want to know, would here be replaced by his effort to learn to deal with or overcome a deficit in regard to thinking processes. For truth to be no longer relevant, this would have to be a deficit void of personal meaning and motivation. . . . If psychoanalysis has indeed changed in this way, one would have to wonder what justifies the claim that this dramatically new approach is, nevertheless, a psychoanalytic one—but also and more important, why such a shift has taken place. (Blass, 2016, p. 332)

Blass's view, like the one elaborated herein, is that there has been an unsupported shift from a focus on mental contents to mental processes such as perception, representation, and memory. Blass forcefully argues that the emphasis on representational deficiency would replace the interpretation of "conflicted dynamic meanings" with a patient's "effort to learn to deal with or overcome a deficit in regard to thinking processes." Against this view stands my proposal that these mental operations are innate and robust. Restated in terms of the current investigation, the role of psychoanalytic treatment is not to develop what are believed to be innate capacities for representation, but to marshal those in the service of greater self-knowledge via the interpretation of conflicts that stand in the way of that goal.

What has led so many to turn away from our traditional definition of psychic truth, away from turbulent conflicts that necessitate protective measures against knowledge too painful to recall in words, but whose essence manages to escape a powerful defensive shield to manifest as somatic symptoms or behavioral enactments, like a tiny green shoot maneuvering between cracks in a concrete pavement? There seems to have been a turning away from that irreducible quality in the psychoanalytic account of the human mind, how it insists on representing our

subjective experience willy-nilly, despite our fondest wishes to forget: that we are propelled from inception by an ineluctable drive to represent meaningful, especially traumatic, experience in any possible manner. We ignore findings that support this view of psychic truth at our peril. To return to D. N. Stern's earlier comments regarding Ricoeur's (1977) endorsement of plausibility as an important criterion for psychoanalytic theorizing:

> plausibility is the point at which the hermeneutic circle of psychoanalysis must open and make contact with other domains of knowledge or speculation—in this case, infant development. . . . A broad intellectual interest in psychoanalysis ultimately rests on this pillar of its relationship and fit with the rest of our current world knowledge. When this relatedness is broken or becomes too weakened, the psychoanalytic discourse stops being interesting and gets left behind—not because it is wrong or right, but because it has lost contact and import for the rest of the intellectual culture. (Stern, 2000, p. 75)

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REFERENCES

Aisenstein, M. (1993). Psychosomatic solution or somatic outcome: The man from Burma—Psychotherapy of a case of haemorrhagic rectocolitis. *International Journal of Psychoanalysis*, 74(2), 371–381.

Aisenstein, M. (2006). The indissociable unity of psyche and soma: A view from the Paris Psychosomatic School. *International Journal of Psychoanalysis*, 87(Pt. 3), 667–680.

Alberini, C. M., Johnson, S. A., & Ye, X. (2013). Memory reconsolidation: Lingering consolidation and the dynamic memory trace. In C. M. Alberini (Ed.), *Memory reconsolidation* (pp. 81–117). Elsevier.

Alberini, C. M., & Travaglia, A. (2017). Infantile amnesia: A critical period for learning to learn and remember. *Journal of Neuroscience*, 37(24), 5783–5795.

Anzieu-Premmereur, C. (2013). The process of representation in early childhood. In H. Levine, G. Reed & D. Scarfone (Eds.), *Unrepresented states and the construction of meaning: Clinical and theoretical contributions* (pp. 240–254). Routledge.

Arlow, J., & Brenner, C. (1964). *Psychoanalytic concepts and the structural theory*. International Universities Press.

Auerbach, J. S. (1993). The origins of narcissism and narcissistic personality disorder: A theoretical and empirical reformulation. In J. Masling & R. F. Bornstein (Eds.), *Empirical studies of psychoanalytic theories: Psychoanalytic perspectives on psychopathology* (pp. 43–110). American Psychological Association.

Beres, D., & Joseph, E. D. (1970). The concept of mental representation in psychoanalysis. *International Journal of Psychoanalysis*, 51(1), 1–8.

Bergstein, A. (2016). Obsessionality: Modulating the encounter with emotional truth and the aesthetic object. *Journal of the American Psychoanalytic Association*, 64(5), 959–982.

Bergstein, A. (2018). The psychotic part of the personality: Bion's expeditions into unmapped mental life. *Journal of the American Psychoanalytic Association*, 66(2), 193–220.

Bernstein, A.E.H., & Blacher, R. S. (1967). The recovery of a memory from three months of age. *Psychoanalytic Study of the Child*, 22(1), 156–167.

Bettelheim, B. (1967). *The empty fortress: Infantile autism and the birth of the self*. Free Press.

Bion, W. R. (1965). *Transformations*. Heinemann.

Bion, W. R. (1970). *Intention and interpretation*. Tavistock.

Blass, R. B. (2016). The quest for truth as the foundation of psychoanalytic practice: A traditional Freudian-Kleinian perspective. *Psychoanalytic Quarterly*, 85(2), 305–337.

Bohleber, W., Fonagy, P., Jimenez, J. P., Scarfone, D., Sverre, V., & Zysman, S. (2013). Toward a better use of concepts: a model illustrated using the concept of enactment. *International Journal of Psychoanalysis*, 94(3), 501–530.

Bond, E. K. (1972). Perception of form by the human infant. *Psychological Bulletin*, 77(4), 225–245.

Botella, C., & Botella, S. (2005). *The work of psychic figurability: Mental states without representation*. Routledge.

Busch, F. (2011). The workable here and now and the why of there and then. *International Journal of Psychoanalysis*, 92(5), 1159–1181.

Busch, F. (2016). The search for psychic truths. *Psychoanalytic Quarterly*, 85(2), 339–360.

Callaghan, B. L., & Richardson, R. (2012). The effect of adverse rearing environments on persistent memories in young rats: Removing the brakes on infant fear memories. *Translational Psychiatry*, 2(7), e138.

Canestri, J. (2005). Some reflections on the use and meaning of conflict in contemporary psychoanalysis. *Psychoanalytic Quarterly*, 74(1), 295–326.

Caper, R. (1998). Psychopathology and primitive mental states. *International Journal of Psychoanalysis*, 79(Pt. 3), 539–551.

Carey, S. (2009). *The origin of concepts*. Oxford University Press.

Clarke, B. (2017). The epistemology behind the curtain: Thoughts on the science of psychoanalysis. *Psychoanalytic Quarterly*, 86(3), 575–608.

Coates, S. W. (2016). Can babies remember trauma? Symbolic forms of representation in traumatized infants. *Journal of the American Psychoanalytic Association*, 64(4), 751–776.

DeCasper, A. J., & Fifer, W. P. (1980). Of human bonding: Newborns prefer their mothers' voices. *Science*, 208(4448), 1174–1176.

DeCasper, A. J., & Spence, M. J. (1986). Prenatal maternal speech influences newborns' perception of speech sounds. *Infant Behavior & Development*, 9(2), 133–150.

Dehaene, S. (2020). *How we learn*. Penguin.

Diamond, M. J. (2014). Analytic mind use and interpsychic communication: Driving force in analytic technique, pathway to unconscious mental life. *Psychoanalytic Quarterly*, 83(3), 525–563.

Diamond, M. J. (2015). The elusiveness of masculinity: primordial vulnerability, lack, and the challenges of male development. *Psychoanalytic Quarterly*, 84(1), 47–102.

Diamond, M. J. (2020). Return of the repressed: Revisiting dissociation and the psychoanalysis of the traumatized mind. *Journal of the American Psychoanalytic Association*, 68(5), 839–887.

Dodd, B. (1979). Lip reading in infants: Attention to speech presented in and out of synchrony. *Cognitive Psychology*, 11(4), 478–484.

Eagle, M., Wolitzky, D., & Wakefield, J. (2001). The analyst's knowledge and authority: A critique of the "new view" in psychoanalysis. *Journal of the American Psychoanalytic Association*, 49(2), 457–488.

Erdelyi, M. H. (1985). *Psychoanalysis: Freud's cognitive psychology*. W. H. Freeman.

Erreich, A. (1984). Learning how to ask: Patterns of inversion in yes-no and wh-questions. *Journal of Child Language*, 11(3), 579–592.

Erreich, A. (1994). Primary and secondary process mentation: Their role in mental organization. *Psychoanalysis and Contemporary Thought*, 17(3), 387–406.

Erreich, A. (2003). A modest proposal: (Re)defining unconscious fantasy. *Psychoanalytic Quarterly*, 72(3), 541–574.

Erreich, A. (2007). The anatomy of a symptom: Concept development and symptom formation in a four-year old boy. *Journal of the American Psychoanalytic Association*, 55(3), 899–922.

Erreich, A. (2015). Unconscious fantasy as a special class of mental representation: A contribution to a model of mind. *Journal of the American Psychoanalytic Association*, 63(2), 247–270.

Erreich, A. (2017). Unconscious fantasy and the priming phenomenon. *Journal of the American Psychoanalytic Association*, 65(2), 195–219.

Erreich, A. (2018). Psychoanalysis and the academy: Working across boundaries with linguistics, cognitive/developmental psychology, and philosophy of mind. *Journal of the American Psychoanalytic Association*, 66(6), 1065–1088.

Erreich, A., Valian, V., & Winzemer, J. (1980). Aspects of a theory of language acquisition. *Journal of Child Language*, 7(1), 157–179.

Field, T. M., Woodson, R., Greenberg, R., & Cohen, D. (1982). Discrimination and imitation of facial expressions by neonates. *Science*, 218(4568), 179–181.

Fodor, J. A. (1983). *The modularity of mind*. MIT Press.

Fonagy, P. (1991). Thinking about thinking: Some clinical and theoretical considerations in the treatment of a borderline patient. *International Journal of Psychoanalysis*, 72(Pt. 4), 639–656.

Fonagy, P., Luyten, P., & Allison, E. (2015). Epistemic petrification and the restoration of epistemic trust: A new conceptualization of borderline personality disorder and its psychosocial treatment. *Journal of Personality Disorders*, 29(5), 575–609.

Freud, S. (1915). The unconscious. In J. Strachey (Ed.), *The standard edition of the complete psychological works of Sigmund Freud: Vol. 14 (1914–1916). On the history of the psycho-analytic movement, papers on metapsychology and other works* (pp. 166–215). Hogarth.

Gaensbauer, T. J. (1995). Trauma in the preverbal period: Symptoms, memories, and developmental impact. *Psychoanalytic Study of the Child*, 50(1), 122–149.

Gaensbauer, T. J. (2004). Telling their stories: Representation and reenactment of traumatic experiences occurring in the first year of life. *Zero to Three*, 24(5), 25–31.

Goren, C. C., Sarty, M., & Wu, P.Y.K. (1975). Visual following and pattern discrimination of face-like stimuli by newborn infants. *Pediatrics*, 56(4), 544–549.

Green, A (1975). The analyst, symbolization and absence in the analytic setting: On changes in analytic practice and experience—In memory of D.W. Winnicott. *International Journal of Psychoanalysis*, 56(1), 1–22.

Green, A. (1986). *On private madness*. Hogarth.

Green, A. (1998). The primordial mind and the work of the negative. *International Journal of Psychoanalysis*, 79(Pt. 4), 649–665.

Green, A. (2000). Science and science fiction in infant research. In J. Sandler, A.-M. Sandler, & P. Fonagy (Eds.), *Clinical and observational psychoanalytic research: Roots of a controversy* (pp. 41–72). Karnac.

Greenberg, J. (2016). Editor's introduction: Is truth relevant? *Psychoanalytic Quarterly*, 85(2), 269–274.

Grotstein, J. S. (1980). A proposed revision of the psychoanalytic concept of primitive mental states, Part 1. *Contemporary Psychoanalysis*, 16, 479–546.

Hayne, H., Greco, C., Earley, L., Griesler, P., & Rovee-Collier, C. (1986). Ontogeny of early event memory: II. Encoding and retrieval by 2- and 3-month-olds. *Infant Behavior & Development*, 9(4), 461–472.

Herzog, D. (2017). *Cold war Freud: Psychoanalysis in an age of catastrophes*. Cambridge University Press.

Hofer, M. A. (2014). The emerging synthesis of development and evolution: A new biology for psychoanalysis. *Neuropsychoanalysis*, 16(1), 3–22.

Johnson, S. C., Dweck, C. S., & Chen, F. S. (2007). Evidence for infants' internal working models of attachment. *Psychological Science*, 18(6), 501–502.

Kabdebon, C., & Dehaene-Lambertz, G. (2019). Symbolic labeling in 5-month-old human infants. *Proceedings of the National Academy of Sciences*, 116(12), 5805–5810.

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, 2, 217–250.

Katz, W. W. (2016). The experience of truth in psychoanalysis today. *Psychoanalytic Quarterly*, 85(2), 503–530.

Kellman, P. J., & Spelke, E. S. (1983). Perception of partly occluded objects in infancy. *Cognitive Psychology*, 15(4), 483–524.

Klein, M. (1975). Notes on some schizoid mechanisms. In Klein, M., *Envy and gratitude and other works, 1946–1963* (pp. 1–24). Free Press. (Original work published 1946)

Laplanche, J., & Pontalis, J.-B. (1973). *The language of psycho-analysis* (D. Nicholson-Smith, Transl.). Norton. (Original work published 1967)

Levine, H. (2012). The colorless canvas: Representation, therapeutic action and the creation of mind. *International Journal of Psychoanalysis*, 93(3), 607–629.

Levine, H. (2020). Reflections on therapeutic action and the origins of psychic life. *Journal of the American Psychoanalytic Association*, 68(1), 9–25.

Levine, H., Reed, G. S., & Scarfone, D. (2013). *Unrepresented states and the construction of meaning: Clinical and theoretical contributions*. Karnac.

Levine, H. B. (2021). Trauma, process and representation. *International Journal of Psychoanalysis*, 102(4), 794–807.

Lewkowicz, D. J., & Turkewitz, G. (1980). Cross-modal equivalence in early infancy: Auditory–visual intensity matching. *Developmental Psychology*, 16(6), 597–607.

Lyons-Ruth, K. (1999). The two-person unconscious: Intersubjective dialogue, enactive relational representation, and the emergence of new forms of relational organization. *Psychoanalytic Inquiry*, 19(4), 576–617.

Mahler, M. (1972). On the first three subphases of the separation-individuation process. *International Journal of Psychoanalysis*, 53(3), 333–338.

Mayes, L. C. (2005). Interface between psychoanalytic developmental theory and other disciplines. In Person E.S., Cooper A.M. & Gabbard G.O., editors, *Textbook of psychoanalysis* (pp. 147–158). American Psychiatric Publishing.

Meltzoff, A. N. (1990). Towards a developmental cognitive science: The implications of cross-modal matching and imitation for the development of representation and memory in infancy. *Annals of the New York Academy of Sciences*, 608, 1–31.

Meltzoff, A. N., & Borton, W. (1979). Intermodal matching by human neonates. *Nature*, 282(5737), 403–404.

Meltzoff, A. N., & Moore, M. K. (1977). Imitation of facial and manual gestures by human neonates. *Science*, 198(4312), 75–78.

Meltzoff, A. N., & Moore, M. K. (1983). Newborn infants imitate adult facial gestures. *Child Development*, 54(3), 702–709.

Meltzoff, A. N., & Moore, M. K. (1985). Cognitive foundations and social functions of imitation and intermodal representation in infancy. In J. Mehler & R. Fox (Eds.), *Neonate cognition: Beyond the blooming, buzzing confusion* (pp. 139–156). Erlbaum.

Menand, L. (2021, December 20). Too good for this world. *The New Yorker*, pp. 64–68.

Mondloch, C. J., Lewis, T. L., Budreau, D. R., Maurer, D., DanneMiller, J. L., Stephens, B. R., & Kleiner-Gathercoal, K. A. (1999). Face perception during early infancy. *Psychological Science*, 10(5), 419–422.

Moon, C. M., Cooper, R. P., & Fifer, W.P. (1993). Two-day-olds prefer their native language. *Infant Behavior and Development*, 16(4), 495–500.

Moon, C. M., & Fifer, W. P. (2000). Evidence of transnatal auditory learning. *Journal of Perinatology*, *20*(8 Pt. 2), S37–S44.

Neisser, U. (1967). *Cognitive psychology*. Appleton-Century-Crofts.

Nelson, K., & Fivush, R. (2004). The emergence of autobiographical memory: A social cultural developmental theory. *Psychological Review*, 111(2), 486–511.

Ogden, T. H. (1989). On the concept of an autistic-contiguous position. *International Journal of Psychoanalysis*, 70(Pt. 1), 127–140.

Oliner, M. (2013). "Non-represented" mental states. In H. Levine, G. Reed, & D. Scarfone (Eds.), *Unrepresented states and the construction of meaning: Clinical and theoretical contributions* (pp. 152–171). Routledge.

Pally, R. (2007). The predicting brain: Unconscious repletion, conscious reflection and therapeutic change. *International Journal of Psychoanalysis*, 88(Pt. 4), 861–881.

Peirce, C. S. (1998). What is a sign? In The Peirce Edition Project (Ed.), *The essential Peirce, Vol. 2*. Bloomington, IN: Indiana University Press. (Original work published 1894)

Perris, E. E., Myers, N. A., & Clifton, N. A. (1990). Long-term memory for a single infancy experience. *Child Development*, 61(6), 1769–1807.

Pinker, S. (1997). *How the mind works*. W. W. Norton.

Posner, M. I. (1973). *Cognition: An introduction*. Scott, Foresman.

Reid, V. M., Dunn, K., Young, R. J., Amu, J., Donovan, T., & Rissland, N. (2017). The human fetus preferentially engages with face-like visual stimuli. *Current Biology*, 27(12), 1825–1828.

Ricoeur, P. (1977). The question of proof in Freud's psychoanalytic writings. *Journal of the American Psychoanalytic Association*, 25(4), 835–871.

Rizzolo, G. S. (2017). The specter of the primitive. *Journal of the American Psychoanalytic Association*, 65(6), 945–977.

Rovee-Collier, C. (1997). Dissociations in infant memory: Rethinking the development of implicit and explicit memory. *Psychological Review*, 104(3), 467–498.

Rovee-Collier, C. (1999). The development of infant memory. *Current Directions in Psychological Science*, 8(3), 80–85.

Rovee-Collier, C., & Cuevas, K. (2009). Multiple memory systems are unnecessary to account for infant memory development: An ecological model. *Developmental Psychology*, 45(1), 160–174.

Serrano, J. M., Iglesias, J., & Loeches, A. (1992). Visual discrimination and recognition of facial expressions of anger, fear, and surprise in 4- to 6-month-old infants. *Developmental Psychobiology*, 25(6), 411–425.

Shahar, G., Cross, L. W., & Henrich, C. C. (2004). Representations in action (or: Action models of development meet psychoanalytic conceptualizations of mental representations). *Psychoanalytic Study of the Child*, 59, 261–293.

Sigel, I. E. (1999). *Development of mental representation: Theories and applications*. Lawrence Erlbaum.

Sommerville, J. A., Upshaw, M. B., & Loucks, J. (2012). The nature of goal-directed action representations in infancy. *Advances in Child Development and Behavior*, 43(), 351–387.

Sopher, R. (2018). An allegiance to absence: Fidelity to the internal void. *Psychoanalytic Quarterly*, 87(4), 729–751.

Stern, D. B. (1983). Unformulated experience—From familiar chaos to creative disorder. *Contemporary Psychoanalysis*, 19(1), 71–99.

Stern, D. B. (2010). *Partners in thought*. Taylor & Francis.

Stern, D. B. (2015). Review: Unrepresented states and the construction of meaning: Clinical and theoretical contributions. H. Levine, G. Reed, &

D. Scarfone. (2013). Karnac: London. *International Journal of Psychoanalysis*, 96(2), 493–498.

Stern, D. B. (2020). Dissociative multiplicity and unformulated experience: Commentary on Diamond. *Journal of the American Psychoanalytic Association*, 68(5), 907–920.

Stern, D. N. (1982). The early development of schemas of self, other, and "self with other." In D. Burkewitz (Ed.), *Reflections on self psychology* (pp. 49–83). International Universities Press.

Stern, D. N. (1985). *The interpersonal world of the child: A view from psychoanalysis and developmental psychology*. Basic Books.

Stern, D. N. (2000). The relevance of empirical infant research to psychoanalytic theory and practice. In J. Sandler, A.-M. Sandler, & P. Fonagy (Eds.), *Clinical and observational psychoanalytic research: Roots of a controversy* (pp. 73–90). Karnac.

Stone, L. J., Smith, H. T., & Murphy, L. B. (Eds.). (1978). *The competent infant series*. Basic Books.

Sullivan, H. S. (1940). *Conceptions of modern psychiatry*. 2nd ed. Norton.

Sullivan, H. S. (1953). *The interpersonal theory of psychiatry*. Norton

Super, C. M. (1972). *Long term memory in infancy*. Unpublished doctoral dissertation, Harvard University.

Terr, L. (1988). What happens to early memories of trauma? A study of twenty children under age five at the time of documented traumatic events. *Journal of the American Academy of Child & Adolescent Psychiatry*, 27(), 96–104.

Vartzopoulos, I., & Beratis, S. (2012). Bodily manifestations in the psychoanalytic process. *Psychoanalytic Quarterly*, 71(3), 657–681.

Valian, V., Winzemer, J., & Erreich, A. (1981). A little-linguist model for learning syntax. In S. Tavakolian (Ed.), *Language acquisition and linguistic theory* (pp. 188–209). MIT Press.

Wolff, P. (1996). The irrelevance of infant observation for psychoanalysis. *Journal of the American Psychoanalytic Association*, 44(2), 369–392.

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