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The role of distancing in Werner and Kaplan's account of symbol formation and beyond

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Abstract

The concept of distancing or polarization plays a central role in Werner and Kaplan's account of symbol formation. It refers to the process of progressive differentiation and hierarchic integration of the four components constitutive of symbolic activity: addressor, addressee, symbolic vehicle and referent. Specifically, Werner and Kaplan suggest that distancing takes place between person and referent, between person and symbolic vehicle, between symbolic vehicle and referent and between addressor and addressee. We describe the theoretical context and different aspects of the distancing process. Furthermore, we argue that the distancing process identifies central prerequisites of symbolic activity that are largely ignored by contemporary developmental theories. We demonstrate the different aspects of the distancing process in several domains of symbolic development, including words, gestural development and pretend play. Finally, we compare Werner and Kaplan's concept of distancing to ideas of distancing developed in recent developmental theories.

Keywords

Symbolic development, Werner, Kaplan, distancing, gestures

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Central to Werner and Kaplan's theory of symbol formation is the concept of distancing. The concept of distancing expresses the orthogenetic principle according to which developmental change proceeds from 'a state of relative globality and undifferentiatedness toward states of increasing differentiation, articulation and hierarchic integration' (Werner & Kaplan, 1963, p. 7). Symbol formation is characterized by an increasing distance or polarization between and integration of the different components involved in symbolization: addressor, addressee or audience, referent and symbolic vehicle. In the following, we will first delineate the theoretical context of distancing, describing how it fits with key assumptions of the organismic-developmental framework and showing how it reflects some philosophical and biological influences on Werner's thinking. Next, we will discuss the different components of the distancing process. We then illustrate aspects of the distancing process for three areas of symbolic development: words, gesture and pretend play. Finally, we will compare Werner and Kaplan's concept of distancing with the role of distancing in two current influential developmental theories, namely Zelazo's (2004) Levels of Consciousness (LOC) theory and Carlson and colleagues' (2005) application of distancing to motivation.

The organismic-developmental framework

The organismic-developmental framework makes two key assumptions about the nature of behavior (Werner & Kaplan, 1963, p. 3–7). First, every behavior is an expression of a larger organization or context, including the Umwelt or life-space of the organism (holism). Second, the activity of the organism is directed: on the one hand, the organism attempts, in its interaction with the world, to conserve its integrity; on the other hand, the organism attempts to develop toward a better equilibrated state. The organism thus is composed of two tendencies that act counter to each other: (a) a conservative tendency (i.e., persisting) and (b) a progressive tendency (i.e., becoming; see Plessner, 1928, pp. 132–146). By conceptualizing development as a differentiation-integration process, these conflicting tendencies are resolved because in this process something old is retained and something new created (i.e., specialization by division and hierarchical coordination of the differentiated parts) (see Bibace & Kharlamov, 2013, pp. 453–462). In this manner, the differentiation-integration process also points to a solution of the learning paradox (Fodor, 1975, 1980).

The human position

The concept of distancing is rooted in a particular view of the human position within the realm of animals. A longer passage from the beginning of the book (Werner & Kaplan, 1963, p. 12) nicely expresses this view:

> The developmental transformation from animal to human existence entails a radical change in the nature of the transactions between the organism and its milieus: human

> beings are not merely, nor mainly, organisms reacting to stimuli or responding to things-of-action. Man forms his Umwelt by relating to his environments in a new manner: he is directed toward knowing. The orientation toward, and the capacity for, knowing are essential and irreducible characteristics of man, characteristics that come clearly into relief when one compares the nature of the adaptiveness of animals and men to their respective environments. In animals – particularly in lower animals – organism and environment are closely attuned to each other; one might say that both are elements in a comparatively closed system, within which stimulus and response are tightly interlocked. With ascendence on the evolutionary scale, the closed system begins to open up the relative rigidity of adaptive responses, the species-specific conformity to environments, gives way increasingly to choice responses, to modifiability and plasticity of behavior, and to an increasing trend toward learning through individual experience.

This view of the human position reflects several themes and ideas of the German philosopher Johann Gottfried Herder (1744–1803)[1] and of the biologist Jakob von Uexküll (1864–1944). Herder (1772/1966, p. 104) characterizes each animal as being adapted to a narrow life space or sphere:

> Into which it is born, in which it stays throughout its life, and in which it dies; and it is a remarkable fact that the keener the senses of the animals, the narrower is their sphere; the more uniform is their artifact . . . . I find everywhere a remarkable observed inverse proportion of the restricted extension of their movements, habitats, food supply, maintenance, copulation, rearing, and social behavior and their drives and artifactive skills.

According to Herder, human beings, by contrast, are not specialized for a uniform, narrow sphere. For example, the human senses are not as selective as those of some animals: human beings have ''senses for all things and hence naturally weaker and duller senses for each one'' (Herder, 1772/1966, p. 105). Indeed, Herder uses quite dramatic expressions to describe the state of the human infant: the human infant is 'the most orphaned child of nature;' 'naked and bare, weak and in need, shy and unarmed;' 'deprived of all guides of life;' born with 'so dispersed, so weakened a sensuousness' (Herder, 1772/1966, p. 107). In light of these constitutional deficiencies of human beings, Herder asks whether nature, who provided animals with everything necessary for survival, has been cruel to human beings, or whether she has provided them with something entirely different instead. Herder believes the latter is the case: thanks to the diffuseness of their senses and their lack of specialization, humans are organized toward freedom and autonomy.

> There is no single work of man in which his actions are not improvable, but he enjoys the freedom of exercise in many things and hence the freedom of improving himself forever. A thought, any thought, is not the direct work of nature, and for that very

> reason it can be a work of his own . . . . No longer an infallible machine in the hands of nature, he himself becomes a purpose and an objective of his efforts (Herder, 1772/1966, p. 109).

For human beings, then, the lack of specialization results in loosing direct determination by nature, which opens up the possibility of self-determination: human beings must make something of themselves, they must construct themselves. For Herder, the typical character of human beings is not based on one particular mental or spiritual faculty. Rather, what is characteristic for human beings is reason, or, as he also calls it, reflection (Herder, 1772/1966, pp. 109–112), which involves a ''particular organization of the body'' (p. 109) and the balanced contribution of sensuality, cognition, and volition.

Language and reflection condition each other (Herder, 1772/1966, p. 121), and both are based on the particular organization of human beings. With language, human beings acquire a medium to fixate their learning experiences. As a consequence, human beings are historical beings who transmit their traditions from one generation to the next. In addition, due to their helpless state at birth, human infants require intensive care and are in need of education. Thus, according to Herder, human beings are 'destined to be social creatures' (Herder, 1772/1985, p. 95, our translation).[2] In the spirit of enlightenment, Herder considers history as an opportunity for human beings to perfect themselves, which follows from his view that reason is not simply a faculty of human beings. Rather, it is a particular organization and a regulative that calls for permanent transcendence: 'We have never been human beings until we have lived to the end of our life; the bee, on the other hand, was a bee from the moment it built its first cell' (Herder, 1772/1985, pp. 84–85, our translation).

Thus, according to Herder, human beings do not differ from animals only in terms of one particular feature, but their whole design is based on a completely different principle that must be understood as an original totality, governed by an all pervasive 'structural law' (Gehlen, 1940/1988, p. 16). As a consequence of their specific organic and bodily constitution, human beings lack the specialization of animals, which gives them freedom in a double sense: freedom from being governed by instincts and freedom to productive self determination. Left unfinished by design, human beings must design themselves.

Werner and Kaplan's view that in animals the organism and the environment are closely attuned to each other bears the marks of von Uexküll's writings. The goal of von Uexküll's programmatic *Umwelttheorie* (1909, 1934/1957) was to reconstruct the phenomenal life-world of animals on the basis of their perceptual and effector organs, which together compose an animal's functional cycle. Famous is von Uexküll's (1934/1957) description of the life-world of the tick, which waits sometimes for years in the branches of a tree for warm-blooded creatures to drop and nourish on. The tick is only receptive to three releasing stimuli: light (photosensitive skin), smell and warmth. Each of these stimuli is correlated with one particular response. For example, when the tick smells the odor of butyric acid,

emitted by the skin glands of all animals, it drops from the tree. Thus, 'the whole rich world around the tick shrinks and changes into a scanty framework consisting, in essence, of three receptor cues and three effector cues – her *Umwelt'* (von Uexküll, 1934/1957, p. 12). Because each animal's organs and behaviors are perfectly adapted to its environment, like a key to its lock, there are as many life-worlds as there are animal species. For each animal, 'the stimuli of the environment constitute a rigid barrier which surrounds the animal like the walls of a house, closing it off from the entire world outside…' (von Uexküll, 1909, p. 212, our translation).

In contrast to the closed world of animals, the human world is open, it is a world to be conquered and created. This conquest starts from a position of weakness and confusion, and the struggle to overcome this confusion never ends because:

> man's objects are always touched with a coefficient of indeterminacy and, as long as he is open to new environments and experiences, they are constantly in the process of transformation, changing in their significance. One may indeed say that man lives constantly in a world of becoming rather than in a world of being (Werner & Kaplan, 1963, p. 13).

Werner and Kaplan suggest that to overcome this weakness, to find orientation in an unfamiliar, open world and to fulfill the pursuit of knowing, human beings need symbols as tools that enable them to represent the world.

Werner and Kaplan describe the ability to use symbols as a dynamic form-building process that emerges in the course of development. Infants are pragmatically oriented toward the world, which for them consists of things-of-action. The emergence of symbols requires a distancing, a shift from an affective-sensory-motor to a contemplative attitude toward the world. The reason for this distancing is nicely captured by Charles Taylor (1971, p. 404):

> To be able to talk about things is to be potentially aware of them outside of any particular transaction with them; it is to be potentially aware of them not just in their behavioural relevance to some activity we are now engaged in, but also in a 'disengaged' way. Language is the major vehicle of this capacity to grasp things in a disengaged way, but language users are also capable of using a number of other vehicles with the same effect: mime, acting out, depiction by drawing, probably nonverbal mental images.

The distancing process, then, is necessary to explain how children make the transition from things-of-action to becoming aware of things in a disengaged way, as things-of-contemplation. For Werner and Kaplan (1963, p. 18) this transition entails that sensory-motor affective patterns that articulated the things-of-action become internalized and are used by an inner dynamic schematizing activity that gives meaning to objects in the context of contemplative (knowing, reflective) activity.

Initially, the symbolic relation between vehicle and referent is based on expressive similarity, realized in an '*intentional act of denotative reference*' (Werner & Kaplan, 1963, p. 21, emphasis in original). Expressive similarity, however, is not an effective means of communicating with psychologically distant addressees. Further distancing is necessary to create an autonomous symbol system that is abstract, impersonal, objective, characterized by a clear distinction between symbol and referent (denaturalized), and suitable for communication with psychologically distant audiences (Werner & Kaplan, 1963, pp. 49, 92).

The four components of distancing

Werner and Kaplan (1963) describe distancing as including four components: two individuals (one addressor and one addressee; note that the addressee can become more abstract with development and may include a group of people), the object of reference (referent) and the referential representation (the symbolic vehicle). All four components undergo change during development; there is a progressive distancing between: (a) addressor and addressee, (b) addressor and referent, (c) addressor and symbolic vehicle and (d) symbolic vehicle and referent. We will now briefly summarize each of these changes, drawing on examples provided by Werner and Kaplan. These examples show that the distance between components breaks down in altered, less differentiated states of consciousness and pathological states such as schizophrenia.

Relation between addressor and addressee

Werner and Kaplan (1963, pp. 42, 49) stress that symbolic development takes place in an interpersonal context that initially is characterized by a relative lack of differentiation between self, other person and object, a constellation which Werner and Kaplan refer to as *primordial sharing situation*. Development leads to a progressive differentiation between self and other persons, 'an increase in interpersonal distance' (Werner & Kaplan, 1963, p. 49). In the primordial sharing situation, experiences are shared first through, for example, the attunement of facial expressions, and later objects are shared and contemplated with the other through referential actions, especially pointing. Whereas the object that pointing gestures refer to remains stuck in the concrete situation, verbal symbols overcome this limitation because they refer to and represent the object by lifting out characteristic features of the object and realizing them 'in another material medium' (Werner & Kaplan, 1963, p. 43). Werner and Kaplan consider the distancing between addressor and addressee to be the driving force that transforms the other aspects of the symbol formation process, eventually resulting in an autonomous symbol system (Werner & Kaplan, 1963, p. 49). At the same time, the relative lack of differentiation between infant and caregiver – Werner and Kaplan here refer to the mother – provides the infant with security because objects infants interact with participate

'in the atmosphere of the mother and hence become secure-familiar things' (Werner & Kaplan, 1963, p. 71).

To examine the effects of addressor-addressee relations on symbolic representation, Werner and Kaplan present a study (conducted by Edith Kaplan) in which the degree of interpersonal closeness and the way in which the stimuli were presented was experimentally manipulated. When adult participants were asked to describe the stimuli to themselves (i.e., inner speech condition), their speech was less objectified (e.g., fewer words, more idiomatic expressions) as compared to when they had to describe the stimuli to an unfamiliar adult (i.e., external speech condition). These findings support Werner and Kaplan's claim that 'the structure of the symbolic representation is intimately tied up with the audience to whom a communication is directed' (Werner & Kaplan, 1963, p. 283). The nature of the stimulus material affected the symbolic representation as well, with olfactory stimuli (which are closely tied to the experience) showing a lesser degree of objectification than visual stimuli (which are experienced as more distant, see Jonas, 1966). The distinction between communication for self (inner speech) and communication for others (external speech), however, is lacking in young children. Werner and Kaplan suggest that initially speech for oneself and speech for others are relatively undifferentiated, and that inner and external speech only gradually co-emerge from this undifferentiated matrix. Even though inner and external speech becomes increasingly polarized with development, they remain closely interrelated 'because of his social nature, a person's *inner life* must be fundamentally linked to *socially organized activity* and to communal ways of thinking. In order to function well in an individual who is in healthy contact with his environment, self-directed speech must hold a course between complete freedom and complete conformity' (Werner & Kaplan, 1963, p. 327, emphasis in original).

The lack of differentiation between self and other in infancy is also characteristic for speech in dreams and in psychological disorders such as schizophrenia, which has ramifications for the addressor-referent, addressor-vehicle and vehicle-referent relations. Werner and Kaplan argue that in dream speech the boundary between the self as addressor and the self as addressee is blurred and that, consequently, dream speech may be considered an extreme form of inner speech (Werner & Kaplan, 1963, p. 241). As a consequence, in dream speech symbolic representation for oneself (i.e., inner speech) is not differentiated from symbolic representation for others (i.e., external speech). Furthermore, schizophrenia 'corresponds to *an extreme shrinkage in distance*, a radical dedifferentiation, among the four basic components' (Werner & Kaplan, 1963, p. 254, emphasis in original). For example, individuals with schizophrenia may assume that the addressee is somehow able to know their internal experiences, fears and needs.

Based on a variety of empirical findings, the idea that self and other initially form an undifferentiated social sharing matrix has recently been challenged (e.g., Legerstee, 1998; Meltzoff, 2007; Trevarthen & Aitken, 2001). Instead, it has been claimed that infants understand similarities between self and other people from birth and engage in complex social reasoning (Baillargeon, Scott, & He, 2010;

Meltzoff, 2007). However, the empirical evidence in support of the rich interpretation of infant social understanding has been criticized (e.g., Carpendale & Lewis, 2010; Müller & Carpendale, 2004; Perner, 2010). At the same time, the epistemological (e.g., indirect access to other, starting from an individualist perspective) and ontological (e.g., relation between body and mind) basis of contemporary approaches to early social understanding has been challenged (see Carpendale & Lewis, 2010; Müller, Carpendale, Bibok, & Racine, 2006; Overgaard, 2006; Zahavi, 2008). Ironically, the idea that self and other differentiate out of an undifferentiated sharing matrix was originally developed in response to exactly those kinds of epistemological and ontological problems that are faced by contemporary theories of social understanding (Scheler, 1923/1970). The problematic status of contemporary theories of social development should justify renewed interest in the idea that social development is rooted in and emerges out of an initially relatively undifferentiated social sharing matrix (Müller & Carpendale, 2004).

Relation between person (addressor) and object (referent)

According to Werner (1948), infants are initially pragmatically oriented toward the world; things are things for action. At this level of functioning, the infant is intrinsically bound up with and dominated by the global situation: 'Things do not stand out there, discrete and fixed in meaning with respect to the cognitive subject. They are intrinsically formed by the psychophysical organization of which they constitute an integral part, by the whole vital motor-affective situation' (p. 59). Consequently, subject and object are merged in a state of consciousness that can be described as a mere state of feeling, with motor-emotional and sensory sensations blended into each other (Werner, 1948, p. 65).

The process of distancing breaks this immediacy between infant and object and establishes a stable world of objects and a stable self (Werner & Kaplan, 1963, p. 44). Actions play an essential part in this distancing (see Gehlen, 1940/1988). For example, by beginning to use parts of his or her own body to master the situation, the infant demonstrates the first signs of instrumentality, which 'indicates a certain release from the domination of the concrete field, a partial differentiation of the happening in which subject and object are fused virtually into one; (Werner, 1948, p. 192). The further development of instrumental actions fosters planning, the reorganization of the visual field and the emergence of personal (and more complex) motives (Werner, 1948, pp. 193–194). Thus, in the course of development, sensorimotor behavior is transformed into internalized thought processes, and the internal dynamic schematizing activity selects features of the object that are then used to represent the object in a different medium (Werner & Kaplan, 1963, p. 44).

The notion of distancing between person and object is central to the sensorimotor level of functioning in Piaget's theory of development (see Müller, Sokol, & Overton, 1998), but it no longer plays a role in many contemporary theories of infant cognitive development. This is largely due to the fact that frequently in

contemporary theories the relation between person and world is conceptualized as a causal, and not as an intentional relation. In contemporary theories, stimuli or inputs impinge on the organism, trigger processing in a computational system, which then produces some sort of internal representation and output (see, for example, Baillargeon 2008; see Allen & Bickhard, 2013, for a detailed criticism).

By reducing the relation between subject and world to a causal relation, however, the concept of objectivity is lost (Müller & Giesbrecht, 2008). We experience the objects as existing separate and independently from us in space, as standing over against us:

> The basic condition for any observation is, therefore, that the observer has been affected by the very thing which he observes, but affected in such a way that the other thing appears to him *as the other*. While observing, I comprehend an object as an object for me. In the living experience of seeing, I comprehend the object both as the other and myself, although not in the same way. (Straus, 1963, pp. 161–162)

Computational processes triggered by an input, however, do not amount to objectivity. The causal process sets a mechanism into motion that yields a particular output or representation, but this is not part of us. In principle, this mechanism does not differ from one that is triggered when inserting a coin into a vending machine and punching in the code triggers a particular outcome (i.e., the release of a candy). Nobody would claim that for the vending machine there is any kind of objectivity. But our human experience tells us there is. Now, it may be argued that our experience of objectivity is just an epiphenomenon, nothing that turns the wheels, a simple after-effect, an illusion. Such an argument, however, would beg the question of how we could ever know what is going on. Essentially, it would undermine our role as observers and scientists who lay claim to truth and justify our beliefs. It would make our own actions and beliefs unintelligible, and would pull away the very ground on which we stand.

The distance between person and world can break down in special states of consciousness and pathological states. In dreams, the relation between person and world is characterized by decreased distance in dream speech. For example, the referents of dreams may be the preferences ('wishes') of the dreamer or bodily states, and they tend to be significantly more personal than referents of everyday communication (Werner & Kaplan, 1963, p. 250). In a similar vein, individuals with schizophrenia may bestow objects in the environment with qualities matching their desires, impulses or sentiments of catastrophe. Extreme consequences of this shrinking distance between individuals with schizophrenia and referents may lead to perceptions of the self becoming an object or being invaded by objects. Further, the shrinking of distance may lead the individual with schizophrenia to make imaginary connection between things as having real consequences (Werner & Kaplan, 1963, p. 256).

Relation between addressor and symbolic vehicle

To describe the distancing between the person and symbolic vehicle, Werner and Kaplan (1963, p. 45) introduce the distinction between the inner cognitive structure and the external, material form of the vehicle. With respect to the external form, distancing between person and symbolic vehicle manifests itself in the change of the representational medium: whereas representation initially is closely tied up with the child's pragmatically-oriented affective-motor-imaginal activity, vocal utterance later becomes the dominant representational medium. Vocal utterance is better suited to serve the functions specific to representational reference because:

> [U]nlike gesture, the phonic material can clearly be differentiated from pragmatic-conative bodily mobility; unlike imagery, the phonic material lends itself to external, interpersonal shaping, and thus is amenable to formation as speech symbols – more or less objective, person-independent entities, which can be 'handed over' from one person to another in social intercourse. (Werner & Kaplan, 1963, pp. 45–46)

The internal form of the symbolic vehicle is the meaning expressed by the vehicle. Distancing here manifests itself as a reduction in idiosyncratic and an increase in conventional and stable meanings.

During dream states, there is decreasing distance between the dreamer and the symbolic vehicle. The addressor's vehicles are personalized with no regard for the typical structure of communal syntax or they are 'conventional forms endowed with more than, or other than, conventional semantic values' (Werner & Kaplan, 1963, p. 241). Further, this 'dream speech' occurs at levels of 'subcodification', that is, subject and objective domains are not easily distinguished, logical connections are not clear and representation is more personal because gestures and imagery are used rather than the verbal medium.

There is also decreasing distance between person and symbolic vehicle in individuals with schizophrenia. Individuals with schizophrenia may use linguistic forms as entities that can be deformed or molded as if they were fluid images (Werner & Kaplan, 1963, p. 258). Similar to how a bad part of an object can be removed, words can also be truncated with the evil parts of the word being left unsaid. For example, an individual with schizophrenia may reject a concept (e.g., democracy) because the word has similar sound-patterns to another word with negative connotations (e.g., the translated word for ''to debase'', Werner & Kaplan, 1963, p. 259).

Relation between referent and symbolic vehicle

During early stages of development, referential objects and symbolic vehicles are relatively undifferentiated and the name of an object is treated as if it were the object itself. An example of this lack of differentiation between vehicle and referent is word-realism, which is the tendency to endow words with a magical power and

attribute to them the properties and causal powers of the objects to which they refer (Werner & Kaplan, 1963, p. 35; see also Watzlawik, 2013). With development, the vehicle becomes 'desubstantialized', that is, it 'loses its ''thing-like'' status and acquires the status of a mediator, whose substance might perhaps best be characterized as ''transparent'' ' (Werner & Kaplan, 1963, p. 47).

Werner and Kaplan again outline the distancing process for both the external and inner form of vehicle and referent. With respect to the external form of vehicle and referent, the distancing produces a decrease in 'tangible ''likeness'' ' (Werner & Kaplan, 1963, p. 48). Whereas symbolic vehicles at lower levels of development imitate features of their referents, as illustrated by onomatopoeia, at more advanced levels, they have become conventionalized and lose the surface similarity to their referents. Concomitantly to the differentiation of the external form, there is an increasing distance between inner and external form of both vehicle and referent. For example, in onomatopoetic expressions, the connotation or meaning is entirely externalized and given in the vocal form. By contrast, in conventional forms, the 'connotative dynamics so to speak ''retreat'' from the external, material surface of the natural expression into the covert domain of organismic schemata' (Werner & Kaplan, 1963, p. 48). With respect to the object of reference, the distancing between inner and external form manifests itself by the shift from grasping an object as a particular, concrete entity to understanding it as an instantiation of a general concept, defined by an abstract network of properties.

During dreams, there is significantly less distance between referents and symbolic vehicles. Dream speech is often characterized by frequent 'word-realism', meaning that words, and even syllables or letters are treated as things (Werner & Kaplan, 1963, p. 250). Further, in dreams a specific sound-pattern is treated as if it had a unique meaning. For instance, when the word 'liability' is spelled out in a dream as 'lie-ability', it refers to a person that the dreamer distrusts.

Distancing: Examples from ontogenesis

We illustrate the usefulness of the concept of distancing for understanding symbolic development for three areas: (a) the development of words; (b) the development of gestures and (c) the development of pretend play. Other examples of the distancing process that, for reasons of space, cannot be elaborated here include drawing (see Müller & Racine, 2010; Werner & Kaplan, 1963, p. 90) and the understanding of external representations (Beilin, & Pearlman, 1991; Liben, 2008).

Words

Werner and Kaplan (1963) discuss the emergence of words, or *vocal depiction* as they call it, in terms of increasing qualitative dissimilarity and increasing spatio-temporal displacement between vehicle and referent. Qualitative dissimilarity between vehicle and referent increases in three steps. First, the sound pattern of the vocal expressions is similar to sonic properties of what they depict

(naturalistic-onomatopoetic depiction). Second, the similarity between vocal utterance and referent moves into non-sonic modalities. For example, variations in the length of the object can be translated into short or long vowels (physiognomic depiction). Third, conventional sound pattern are adopted for referents. Werner and Kaplan (1963, pp. 106–108) identify a number of transitional steps between onomatopoetic/physiognomic and conventional sound patterns. The increasing distance of referent from vehicle is a natural product of use of a vocal pattern in different contexts; as a result, the referent becomes less closely tied to a particular sound pattern. The adoption of conventional forms then reinforces the distancing process by denaturalization of the vocal pattern. The gradual increase of the spatiotemporal distance between vehicle and referent reflects the use of language to transcend the immediate here-and-now and shows that the child becomes capable of using language as an instrument for 'articulating and communicating about rather abstract and remote contents' (Werner & Kaplan, 1963, p. 113).

The first conventional words are used in a global and nonspecific manner such that agent, action and object are fused. They become more delimited and differentiated in the course of communication. Further differentiation and integration processes then lead to the articulation of different aspects of the state of affairs in the linguistic utterance (Werner & Kaplan, 1963, pp. 131–158).

Gesture

Werner and Kaplan (1963, pp. 84–98) discuss gesture as one medium in which symbolic representation emerges (see also Levy & McNeill, 2013). Symbolic 'motor-gestural depiction', as Werner and Kaplan term it (1963, p. 84), is based on non-symbolic and pragmatically oriented motor action that does 'not ''refer'' to or represent the affective content but rather includes this content in the reactive pattern' (Werner & Kaplan, 1963, p. 85). Gestural depiction requires the differentiation between the gesture (vehicle) and its referent. Initially, the infant responds with global affective-sensorimotor movements that often resonate with the movements and emotional expressions of others. In the course of the first year of life, the global and undifferentiated movements gradually develop in stable, articulated and goal-directed action patterns. The emergence of intentional motor imitation leads to the differentiation between perceived event and action and paves the way for the distancing between the gesture and its content, 'both in regard to the degree of similarity between the material of the depictive element and of the depicted element and in regard to temporal-spatial relations between the depictive and the depicted moments' (Werner & Kaplan, 1963, p. 88). The imitative movements become increasingly dissimilar to those of the model, and, at the end of the second year of life, children start to use bodily movements to imitate non-kinetic properties of things such as their form. For example, they may imitate the form of an orange by inflating their cheeks (Werner & Kaplan, 1963, p. 89). According to Werner and Kaplan (1963), depictive gestures reflect a distance between the movement and what they depict and provide evidence that the child has begun to 'translate

realistic events into a medium with its own expressive features: the imitative expressions have developed into truly *pictorial* or *iconic* representations' (p. 89, emphases in original). The emergence of delayed imitation (i.e., imitation of actions at a temporal distance) attests to a further distancing between gestural depiction and content and implies that the gesture is now regulated by an inner schema (Werner & Kaplan, 1963, p. 91).

Thus, symbolic representational gestures originate in and exploit pragmatic action patterns such as anticipatory and imitative action pattern, and in this process ('shift of function'), the action patterns become qualitatively and temporal-spatially distant from the depicted content.

One feature of these action patterns that is important for the emergence of symbolic representation is their dynamic-vectorial nature. By this, Werner and Kaplan (1963, p. 86) mean dynamic qualities (i.e., amodal sensory properties) such as rhythm, direction, force and balance that are not specific to any specific sensory modality but overlap several modalities. Werner and Kaplan's suggestion that signifiers that are related to their referents by some sort of resemblance emerge before signifiers more arbitrarily related to their referents has been criticized based on the findings that words and arbitrary gestures develop simultaneously with iconic gestures (e.g., Acredolo & Goodwyn, 1988; Morford, Singleton, & Goldin-Meadow, 1995; Namy, 2008). However, it cannot be ruled out that for children early words and arbitrary gestures are rooted in some sort of physiognomic resemblance to what they denote (Werner & Kaplan, 1963, pp. 99–112).

Pantomime is another area that illustrates the distancing between vehicle and referent (Levy & McNeill, 2013). In a seminal study, Overton and Jackson (1973) asked 3- to 8-year-old children to pretend to execute different action sequences (e.g., to brush their teeth). Younger children used a body part to model the action (e.g., used a finger to substitute for a toothbrush), whereas older children pretended to hold an imaginary toothbrush (e.g., used a hand as if correctly holding and operating a toothbrush) (see also Boyatzis & Watson, 1993; Dick, Overton, & Kovacs, 2005; O'Reilly, 1995). These findings suggest that the symbolic vehicle (pantomime gesture) and object depicted are initially similar (body part as object) but become increasingly dissimilar with development.

Pretend play

The development of pretend play nicely illustrates the distancing processes outlined by Werner and Kaplan (see McCune, 1995, 2010; McCune-Nicolich, 1981). First, pretend play presupposes a distancing between person and object, a stable world of objects and stable action meanings that children can use in a transferred way (Ter Hark, 2006). Second, the development of pretend play involves a distancing between person and vehicle such that pretend play becomes increasingly decentered as children move from using only the self as agent (e.g., pretending to drink from an empty cup) to using a substitute object as active agent (e.g., pretending that the doll herself pours tea into a cup; see Fenson & Ramsay, 1980; Watson & Jackowitz, 1984).

Third, the development of pretend play illustrates an increasing distance between symbolic vehicle and referent as the substitute objects or vehicles used in pretend play become increasingly less perceptually and functionally similar to the objects they signify (Bigham & Bourchier-Sutton, 2007; Jackowitz & Watson, 1980; Musatti & Mayer, 1987). Fourth, there is distancing between addressor and addressee as manifest in the audience-related behavior of the child (e.g., smiling at the addressee), which is an early sign of pretence (Piaget, 1945/1962) and reflects some awareness of the other as onlooker to the action. In addition, a further increase in distance between the actors in pretend play is discernible when children, at around the age 3 years, take on and integrate complementary roles (Howes & Matheson, 1992; see also Gillespie & Zittoun, 2013). Werner and Kaplan (1963, p. 94) suggest that play increasingly becomes an autonomous medium that is 'directed towards the depiction of events and objects of everyday life'.

Symbols promote distancing: Comparison with contemporary theories

The process of distancing in Werner and Kaplan's monograph largely deals with prerequisites for the emergence of an autonomous symbol system. However, it could be argued that the emergence of symbols, in turn, promotes further distancing between person and world. This position has been particularly highlighted in Vygotsky's sociocultural theory. For Vygotsky (1934/1986), psychological distance is achieved largely through semiotic mediation and the main tool of semiotic mediation is speech. Speech transforms the child's relation to the world by creating a representational 'space' that is psychologically removed from the immediate perceptual field:

> The child is much more easily able to ignore the vector that focuses attention on the goal itself, and to execute a number of complex preliminary acts, using for this purpose a comparatively long chain of auxiliary instrumental methods. The child proves able to include independently, in the process of solution of the task, objects which lie neither within the near nor the peripheral visual field. By creating through words a certain intention, the child achieves a much broader range of activity, applying as tools not only those objects that lie near at hand, but searching for and preparing such articles as can be useful in the solution of its task and planning its future actions. (Vygotsky & Luria, 1994, p. 110)

Speech is also important for the child's development of self-regulation because 'with the aid of speech the child for the first time proves able to be master of its own behavior, relating to itself as to another being, regarding itself as an object' (Vygotsky & Luria, 1994, p. 11).

Following Vygotsky, contemporary developmental approaches highlight the important of speech for cognitive and motivational-affective distancing. We will discuss the two influential approaches by Zelazo and Carlson and colleagues.

Distancing in Zelazo's Levels of Consciousness model

The concept of psychological distancing is a central feature of Zelazo's Levels of Consciousness (LOC) model (e.g., Zelazo & Jacques, 1996; Zelazo, Müller, Frye, & Marcovitch, 2003), a developmental information-processing account of the age-related changes in children's behavior. Zelazo (1999; 2004) proposes that children's consciousness is composed of several hierarchically organized and dissociable levels, which emerge over the course of the preschool years. The first and most basic form of consciousness (present in neonates) is *minimal consciousness* (minC). This LOC is intentional ('about' something in Brentano's sense), but unreflective and bound to the present moment. Each subsequent higher LOC (i.e., recursive consciousness, self-consciousness and reflective consciousness; see Zelazo, 2004) emerges from the previous LOC, through the processes of recursion and reflection. Recursion allows for reflective processing to be interpolated between a stimulus and response, and in this way, higher LOCs are minC with additional degrees of reflective processing. This increase in reflection corresponds to increasing psychological distance from minC, which allows the infant or child to separate him/herself from the immediate physical world.

In Zelazo's LOC model, minC is analogous to the initial state of undifferentiated experience described by Werner and Kaplan (1963). For example, in the discussion of distancing between person and object, Werner and Kaplan describe the experience of early objects as 'probably much like the ''things-of-action'' characteristic of the infrahuman level, that is, they are things of momentary affective striving and of biologically directed action' (p. 44). In a similar way, Zelazo (1999) describes infants' behavior at the level of minC as being unreflective and due to 'action programs' triggered by objects reflexively or associatively. However, whereas Werner and Kaplan (1963) use the concept of distancing to explain the emergence of an autonomous symbol system, Zelazo (2004) argues that names or verbal labels are crucial for the processes of recursion and reflection. Labels, and language more generally, allow for one's subjective experiences to become objects of reflection, which is necessary for the emergence of the first 'higher order' LOC (recursive consciousness). Thus, whereas Zelazo (2004) suggests that psychological distance develops through the process of reflection, which is dependent on the use of language, for Werner and Kaplan, it is through the processes of distancing that symbolic systems, such as language, gradually emerge.

Motivational aspects of distancing

Carlson and colleagues (2005) have also discussed the role of psychological distancing in motivation and self-regulation, suggesting that the development of symbolic functioning in preschoolers may facilitate the development of self-regulation or executive functioning by increasing psychological distance. For example, in the Less is More task, children are required to point to a smaller set of treats in order to receive a larger reward. Three-year-olds have difficulty pointing to the

smaller array of treats, while 4- and 4.5-year-olds perform significantly above chance. However, when abstract quantity symbols were used in place of the treats (i.e., mouse and elephant symbols instead of arrays of two and five treats, respectively), the probability of an optimal response in 3-year-olds increased significantly (Carlson et al., 2005).

As Carlson et al. (2005) note, these findings support previous research that has shown a facilitative effect of symbolization on self-control. For example, Mischel and Baker (1975) found that children were able to wait longer for a larger reward (two marshmallows instead of one) in the classic delay of gratification paradigm when they were instructed to imagine the marshmallows in an abstract way (i.e., as 'fluffy white clouds') compared to when they were told to imagine the delicious 'sweet and chewy' taste. Metcalfe and Mischel (1999) have proposed a neural network model composed of a 'hot' and 'cool' activation system underlying self-regulatory behavior. The hot 'go' system is reflexive, stimulus driven and develops early in life. Conversely, the cool 'know' system is reflective, emotionally neutral and develops later. While these two systems are separate processes, their interactions are especially important in driving self-regulatory behavior.

In the delay of gratification task, the reward can be represented in a 'hot' manner as in when the child is asked to focus on the consummatory aspects of the stimulus (i.e., the chewy texture and sweet taste), activating the hot 'go' system or as a cool representation when the child reframes the reward in an abstract or symbolic way (i.e., as fluffy clouds). Carlson et al. (2005) have suggested that abstract or symbolic systems direct attention away from the 'hot' aspects of the stimulus, instead activating the cool 'know' system, by 'producing psychological distance that enables children to withhold a dominant response' (p. 610). The findings from the Less is More task further support this idea, with an abstract quantity symbol (mouse vs. elephant) evoking the most optimal performance in 3-year-olds. Carlson et al. (2005) suggest that the symbol allows the child to distance him/herself from the stimulus, which enables 'cool' self-reflective control over the behavioral response. In the standard version of the task, the tempting stimulus is identical to the reward (differing only in quantity) and the salience of reward activates a reflexive 'go' response in 3-year-olds, leading to less than optimal performance.

Conclusion

In Werner and Kaplan's theory, the concept of distancing plays a central role in explaining the emergence of an autonomous symbol system. Werner and Kaplan provide examples from child development to show how this process leads to increasing distance between addressor, addressee vehicle, and referent, and they illustrate how the distance collapses in altered de-dedifferentiated states of consciousness and pathological states. The process is particularly well developed for the distancing between vehicle and referent. A shortcoming of Werner and Kaplan's theory, however, is that even though they provide detailed descriptions of the behavior pattern that reflect varying degrees of distance, they rarely address the specific mechanisms

by means of which this distancing occurs. They briefly mention that imitation and the use of words in varied context may play a role (see above), and these examples are short and only apply to the distancing between vehicle and referent. Furthermore, even though the distancing process is firmly rooted within a sharing matrix and the distancing between addressor and addressee is identified as the motor of the process, Werner and Kaplan are essentially silent on how this occurs. Clearly, future work using the distancing concept should elaborate in more fine-grained detail the mechanisms that advance the distancing process. When it comes to the distancing between person and world, future work should draw on Piaget's (Kesselring & Müller, 2011) and Gehlen's (1940/1988) work, as both of these theorists have provided a fine-grained analysis of this process.

As we discussed, contemporary theories use the concept of distancing to explain the development of cognitive control and motivational-affective self-regulation. These theories are based on Vygotsky's idea that symbols are mediating devices that increase the distance. Thus, whereas Werner and Kaplan emphasized the importance of distancing for the emergence of an autonomous symbol system contemporary theories explain distancing through the use of symbols. However, these approaches may just highlight different steps in the distancing process. Furthermore, Werner and Kaplan (1963, pp. 321–326) clearly recognized the important function of speech in cognitive control. Clearly, future work may strive to integrate Piaget's decentration model that emphasizes the distancing between infant and world, Werner and Kaplan's theory that emphasizes the distancing between person and vehicle and vehicle and referent and Vygotsky's theory that emphasizes the distancing that is accomplished by symbols. The piece of the puzzle that would still be missing is a detailed theory of the distancing between addressor and addressee (i.e., infant and caregiver).

With few exceptions, however, the concept of distancing has disappeared from contemporary developmental science. Part of the reason is the dominance of the causal representational theory of mind according to which the child is largely passive and the relation between child and world external. However, when the child is conceptualized as active and intrinsically directed toward the world, the concept of distancing becomes necessary to explain why human beings become capable of looking at their field of action as reflective observers, rather than as engrossed participants (Cassirer, 1932/1985).

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Notes

1. Werner's (1934/1978) theory of sense and expressiveness was heavily influenced by Herder's (1772/1966) idea that all senses flow together in one common feeling, the *sensorium commune*.

2. Only part I of Herder's *Essay on the Origin of Language* (1772/1966) has been translated into English; references to part II are based on the German edition (1772/1985).

References

Acredolo, L., & Goodwyn, S. (1988). Symbolic gesturing in normal infants. *Child Development*, *59*, 450–466.

Allen, J. W. P., & Bickhard, M. H. (2013). Stepping off the pendulum: Why only an action-based approach can transcend the nativist–empiricist debate. *Cognitive Development*, *28*, 96–133.

Baillargeon, R. (2008). Innate ideas revisited: For a principle of persistence in infants' physical reasoning. *Perspectives on Psychological Science*, *3*, 2–12.

Baillargeon, R., Scott, R. M., & He, Z. (2010). False-belief understanding in infants. *Trends in Cognitive Sciences*, *14*, 110–118.

Beilin, H., & Pearlman, E. G. (1991). Children's iconic realism: Object vs. property realism. In H. W. Reese (Ed.), *Advances in Child Development and Behavior* (Vol. 23, pp. 73–111). New York, NY: Academic Press.

Bibace, R., & Kharlamov, N. (2013). The spiral: The concept of development after Werner and Kaplan. *Culture & Psychology*, *19*(4), 453–462.

Bigham, S., & Bourchier-Sutton, A. (2007). The decontextualization of form and function in the development of pretence. *British Journal of Developmental Psychology*, *25*, 335–351.

Boyatzis, C. J., & Watson, M. W. (1993). Preschool children's symbolic representation of objects through gestures. *Child Development*, *64*, 729–735.

Carlson, S. M., Davis, A. C., & Leach, J. G. (2005). Less is more: Executive function and symbolic representation in preschool children. *Psychological Science*, *16*, 609–616.

Carpendale, J. I. M., & Lewis, C. (2010). The development of social understanding: A relational perspective. In W. F. Overton (Ed.), *Cognition, Biology, and Methods across the Lifespan. Volume 1 of the Handbook of Life-Span Development* (pp. 548–627). Hoboken, NJ: Wiley.

Cassirer, E. (1932/1985). Die Sprache und der Aufbau der Gegenstandswelt [Language and the construction of the objective world]. In E. W. Orth, & J. M. Krois (Eds.), *Ernst Cassirer: Symbol, Technik, Sprache. Aufsätze aus den Jahren 1927–1933* [Ernst Cassirer: Symbol, technic, language: Essays from 1927 to 1933] (pp. 121–160). Hamburg, Germany: Felix MeinerVerlag.

Dick, A. S., Overton, W. F., & Kovacs, S. L. (2005). The development of symbolic coordination: Representation of imagined objects, executive function, and theory of mind. *Journal of Cognition and Development*, *6*, 133–161.

Fenson, L., & Ramsay, D. S. (1980). Decentration and integration of the child's play in the second year. *Child Development*, *51*, 171–178.

Fodor, J. A. (1975). *The language of thought*. New York, NY: Crowell.

Fodor, J. A. (1980). Fixation of belief and concept acquisition. In M. Piattelli-Palmerini (Ed.), *Language and learning: The debate between Jean Piaget and Noam Chomsky* (pp. 142–149). Cambridge, MA: Harvard University Press.

Gehlen, A. (1940/1988). *Man, his nature and place in the world*. New York: Columbia University Press.

Gillespie, A., & Zittoun, T. (2013). Meaning making in motion: Bodies and minds moving in institutional and semiotic structures. *Culture & Psychology*, *19*(4), 518–532.

Herder, J. G. (1966). Essay on the origin of language. In J. H. Moran, & A. Gode (Eds.), *On the origin of language* (pp. 87–166). New York, NY: Frederick Ungar Publishing, Co.
Herder, J. G. (1772/1985). *Abhandlung über den Ursprung der Sprache*. Stuttgart, Germany: Reclam.
Howes, C., & Matheson, C. (1992). Sequences in the development of competent play with peers: Social and social pretend play. *Developmental Psychology*, *28*, 961–978.
Jackowitz, E. R., & Watson, M. W. (1980). Development of object transformation in early pretend play. *Developmental Psychology*, *16*, 543–549.
Jonas, H. (1966). *The phenomenon of life: Toward a philosophical biology*. New York, NY: Harper & Row.
Kesselring, T., & Müller, U. (2011). The concept of egocentrism in the context of Piaget's theory. *New Ideas in Psychology*, *29*, 327–345.
Legerstee, M. (1998). Mental and bodily awareness in infancy: Consciousness of self-existence. *Journal of Consciousness Studies*, *5*, 627–644.
Levy, E. T., & McNeill, D. (2013). Narrative development as symbol formation: Gestures, imagery and the emergence of cohesion. *Culture & Psychology*, *19*(4), 548–569.
Liben, L. (2008). Embodiment and children's understanding of the real and represented world. In W. F. Overton, U. Müller, & J. Newman (Eds.), *Developmental perspectives on embodiment and consciousness* (pp. 191–224). New York, NY: Taylor & Francis.
McCune, L. (1995). A normative study of representational play at the transition to language. *Developmental Psychology*, *31*, 198–206.
McCune-Nicolich, L. (1981). Toward symbolic functioning: Structure of early pretend games and potential parallels with language. *Child Development*, *52*, 785–797.
McCune, L. (2010). Developing symbolic activities. In B. Wagoner (Ed.), *Symbolic transformation: The mind in movement through culture and society* (pp. 193–208). London, UK: Routledge.
Metcalfe, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: Dynamics of willpower. *Psychological Review*, *106*, 3–19.
Meltzoff, A. N. (2007). 'Like me': A foundation for social cognition. *Developmental Science*, *10*, 126–134.
Mischel, W., & Baker, N. (1975). Cognitive appraisals and transformations in delay behavior. *Journal of Personality and Social Psychology*, *31*, 254–261.
Morford, J. P., Singleton, J. L., & Goldin-Meadow, S. (1995). The genesis of language: How much time is needed to generate arbitrary symbols n a sign system. In K. Emmorey, & J. Reilley (Eds.), *Language, gesture, and space* (pp. 313–332). Hillsdale, NJ: Erlbaum.
Müller, U., Carpendale, J. I. M., Bibok, M., & Racine, T. P. (2006). Subjectivity, identification, and differentiation: Key issues in early social development. *Monographs of the Society for Research in Child Development*, *71*, 167–179.
Müller, U., & Carpendale, J. I. M. (2004). The development of social understanding in infancy. In J. I. M. Carpendale, & U. Müller (Eds.), *Social interaction and the development of knowledge* (pp. 215–238). Mahwah, NJ: Erlbaum.
Müller, U., & Giesbrecht, G. (2008). Methodological and epistemological issues in the interpretation of infant cognitive development. *Child Development*, *79*, 1654–1658.
Müller, U., & Racine, T. P. (2010). The development of representation and concepts. In R. M. Lerner, & W. F. Overton (Eds.), *The handbook of life-span development, Vol. 1: Cognition, biology, and methods* (pp. 346–390). New York, NY: John Wiley & Sons, Inc.

Müller, U., Sokol, B., & Overton, W. F. (1998). Reframing a constructivist model of the development of mental representation: The role of higher-order operations. *Developmental Review*, *18*, 155–201.

Musatti, T., & Mayer, S. (1987). Object substitution: Its nature and function in early in early pretend play. *Human Development*, *30*, 225–235.

Namy, L. L. (2008). Recognition of iconicity doesn't come for free. *Developmental Science*, *11*, 841–846.

O'Reilly, A. W. (1995). Using representations: Comprehension and production of actions with imagined objects. *Child Development*, *66*, 999–1010.

Overgaard, S. (2006). The problem of other minds: Wittgenstein's phenomenologicalperspective. *Phenomenology and the Cognitive Science*, *5*, 53–73.

Overton, W. F., & Jackson, J. P. (1973). The representation of imagined objects in action sequences: A developmental study. *Child Development*, *44*, 309–314.

Perner, J. (2010). Who took the co out of cognitive science? Mentalism in an era of anticognitivism. In P. A. Frensch, & R. Schwarzer (Eds.), *International perspectives on psychological science* (Vol. 1, pp. 241–261). New York, NY: Psychology Press.

Piaget, J. (1945/1962). *Play, dreams, and imitation in children*. New York, NY: W. W. Norton & Co.

Plessner, H. (1928). *Die Stufen des Organischen und der Mensch* [The levels of the organic and the human being]. Berlin, Germany: Göschen.

Scheler, M. (1923/1970). *The nature of sympathy* (transl. by P. Heath). New York, NY: Archon Book.

Straus, E. W. (1956/1963). *The primary world of senses*. London: Glencoe.

Taylor, C. (1971). What is involved in a genetic psychology? In T. Mischel (Ed.), *Cognitive development and epistemology* (pp 393–416). New York, NY: Academic Press.

Ter Hark, M. (2006). Wittgenstein, pretend play and the transferred use of language. *Journal for the Theory of Social Behaviour*, *36*, 299–318.

Trevarthen, C., & Aitken, K. J. (2001). Infant intersubjectivity: Research, theory, and clinical applications. *Journal of Child Psychology and Psychiatry*, *42*, 3–48.

Von Uexküll, J. (1909). Umwelt und Innenwelt der Tiere (The external and internal world of animals). Berlin, Germany: Julius Springer Verlag.

Von Uexküll, J. (1934/1957). A stroll through the worlds of animals and men. A picture book of invisible worlds. In C. H. Schiller (Ed.), *Instinctive behavior. The development of a modern concept* (pp. 5–80). New York, NY: International Universities Press.

Vygotsky, L. S. (1934/1986). *Thought and language*. Cambridge, MA: MIT Press.

Vygotsky, L., & Luria, A. (1994). Tool and symbol in child development. In R. vander Veer, & J. Valsiner (Eds.), *The Vygotsky reader* (pp. 99–174). Oxford, UK: Blackwell Publishing.

Watson, M. W., & Jackowitz, E. R. (1984). Agents and recipients in the development of early object play. *Child Development*, *55*, 1091–1097.

Watzlawik, M. (2013). Do you believe in magic. *Culture & Psychology*, *19*(4), 506–517.

Werner, H. (1934/1978). Unity of the senses. In S. S. Barten, & M. B. Franklin (Eds.), *Developmental processes: Heinz Werner's selected writings. Vol. 1: General theory and perceptual experience* (pp. 107–130). New York, NY: International Universities Press, Inc.

Werner, H. (1948). *Comparative psychology of mental development* (2nd ed.). Chicago: Follett Publishing.

Werner, H., & Kaplan, B. (1963). *Symbol formation: An organismic-developmental approach to language and the expression of thought*. New York, NY: John Wiley & Sons, Inc.

Zahavi, D. (2008). Simulation, projection, empathy. *Consciousness and Cognition*, *17*, 514–522.
Zelazo, P. D. (1999). Language, levels of consciousness, and the development of intentional action. In P. D. Zelazo, J. W. Astington, & D. R. Olson (Eds.), *Developing theories of intention: Social understanding and self-control* (pp. 95–117). Mahwah, NJ: Erlbaum.
Zelazo, P. D. (2004). The development of conscious control in childhood. *Trends in Cognitive Sciences*, *8*, 12–17.
Zelazo, P. D., & Jacques, S. (1996). Children's rule use: Representation, reflection, and cognitive control. *Annals of Child Development*, *12*, 119–176.
Zelazo, P. D., Müller, U., Frye, D., & Marcovitch, S. (2003). The development of executive function in early childhood: VI. The development of executive function: Cognitive complexity and control–revised. *Monographs of the Society for Research in Child Development*, *68*, 93–119.

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