INDEXICAL REFERENCE TO
ABSENT OBJECTS:  EXTENSIONS OF
THE PEIRCIAN NOTION OF INDEX

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Introduction

Reference to absent objects by means of indexical signs, such as gestures and deictic terms, represents a particularly fertile issue for theoretical and empirical inquiry. It embodies the use of a directional sign which typically indicates a referent in the here and now, but which, in the case of absent objects, refers to a signified which is no longer in the here and now. The ontogeny of index in psychosocial development is discussed with emphasis on index to present, and afterward, to absent objects. The state of the art with respect to empirical research tracing when children first recognize/apprehend, and later refer indexically, to absent objects validates the claim that social index, i.e., use of joint bidirectional attention schemes, is the linchpin in absent object recognition. Later, when gestural and linguistic indices are employed to refer to absent referents, eidetic memory of observed/experienced events serves as a catalyst toward absent object reference (Bühler 1934/1982: 27-28); and index begins to connect persons, objects and events (McNeill 1992: 297). During later childhood when intra-psychological advances are solidified, mental operations can serve as index to point to possible referents which include non-existent, subjectively imagined entities/events.

Peirce’s concept of index is extended to incorporate Jakobson’s scheme by means of an analysis of the role of contiguity for indexical and symbolic signs. To illustrate the development of index from infancy to adolescence, interpretants for developmental stages within Firstness, Secondness, and Thirdness are proposed. The developmental particulars of Peirce’s indexical interpretants in the scheme of Firstness, Secondness and Thirdness demonstrates that underlyingly, Peirce appears to have sown the seeds to extend his original restricted notion of index, superseding the physically contiguous relationship between signified and signifier.
Peirce’s Notion of Index

From a phenomenological perspective, which represents Peirce’s theoretical axis, index must be located within the same spacio-temporal context as its corresponding referent/signified; the two must be co-present with one another. According to Peirce, indices possess two primary attributes: 1. they refer to an individual person/object/group and 2. they “direct the attention to their objects” (CP 2.306). In other words, indices point out, or direct someone toward, an object in the same environment. An exit sign, or an index finger pointing at a referent, constitute quintessential indexical signs. For Peirce, a defining attribute of index is that it is in existential relationship with its referent object in space and time, establishing and maintaining a sense of physical contiguity between the two. Because a pivotal aspect of the traditional Peircian notion of index entails the function of pointing out an object from among other objects, the intended referent of a particular index must be present along with other possible referents to be indexed. Contiguity, here, is restricted to the physical and factual in that both the signified and the signifier must co-occur and be visually present to the message producer.

This restriction to the visual present is especially poignant in the case of children’s early use of indexical gestures and deictic terms. Although Peirce’s notion of index proper captures children’s early use of gestural and linguistic indices to refer to present objects, its adequacy to characterize children’s reference to absent objects is questionable.

Requiring that indexical signs spatially and temporally co-occur with their referents precludes the use of physical indices to refer to displaced objects (hidden, absent and the like). This requirement for physical contiguity relegates mental signs (memories of objects not visually apparent) to their iconic and symbolic functions only. Despite the iconic and symbolic function of mental signs e.g. envisioning an experience with non-present objects, such signs can operate to invoke a gesture/deictic term, indicating the conspicuous absence of an object/person which is ordinarily present. The recognition of the absence of an object which is expected to be present in the spatio-temporal milieu appears to serve as the catalyst for the use of deictics and gestural indicators to point toward the place of the non-present object; consequently, the use of indexical signs toward places where conspicuously absent objects are typically located appears to characterize a transition in indexical use beyond the purely existential. Hence, in a less traditional Peircian sense,

1 In summarizing Peirce’s features of index, Atkin (2005: 164-165) distinguishes the following: significatory, independence, singularity, indicatory and phenomenological features.
mental signs can serve an indexical as well as an iconic and/or symbolic function. “Every subject partakes of the nature of an index, in that its function is the characteristic function of an index, that of forcing the attention upon its object” (CP 2.357). This claim is supported by Peirce’s assertion that purely directional indices, such as directional gestures, are degenerate, whereas those involving icon and/or symbol are genuine. (See Atkin 2005 pages 178-184 for a more extensive discussion of the grounds for the distinction between genuine and degenerate indices.)

Peirce further claims a genuine index not only indicates its object, but provides information about it too. A degenerate index, on the other hand, simply indicates without conveying extra information... Peirce claims that the presence of an icon is essential for the informationality of genuine indexical signs, the clearest statement of which comes from (CP 5.75 (1903)) where Peirce says, “that by an involved icon, it [an indexical sign] actually conveys information". (Atkin 2005)

Purely directional signs fail to convey any qualitative information about their signified - the most quintessential of these is directional gestures. Deictic terms, although degenerate indices, may be less degenerate than are indexical gestures since they depend upon both directional and invariant/symbolic meaning, e.g., “I” referring to a particular individual using the term (indexical) and “I” in its symbolic function referring to the class of speaker.

This convergence of the indexical with the symbolic and deictic use lends some credibility to the use of index to refer to objects which are not physically present, but are absent and/or exist as mental objects only. Peirce intimates his tacit extension of index into non-existential relationships with its referent: “Insofar as the index is affected by the object, it necessarily has some quality in common with the object. It does, therefore, involve a sort of icon, although an icon of a particular kind; it is not a mere resemblance of its object...but an actual modification of it by the object” (CP 2.248). This emphasizes the multi-functionality of indexical signs without precluding their indexical function and underscores that no indexical sign can be indexical alone, especially those belonging to Peirce’s genuine type. The fact that the effect of these early gestural indexical signs is based in Firstness illustrates Peirce’s unequivocal claim that all purely directional indices are degenerate in that they do not involve icon and/or symbol. “For the sign and its object to share qualities in a way that suggest iconic involvement, the quality must be due to an effect the object has upon the sign.” (Atkins 2005, p. 182; CP 2.248) Iconic involvement, then, is the sharing of a quality between sign and object which, because it comes about as a result of the sign/object relation, means that information can be conveyed about
the object (Atkin 2005). Icon (or Firstness) is evidenced in indexical signs both at early stages in development and at later ones.

**The Ontogeny of Indexical Interpretants**

Infants’ early use of gesture to follow another’s alteration in gaze, which appears to be proto-indexical (see Table 1), is grounded in

<table>
<thead>
<tr>
<th>AGES</th>
<th>0:0-0:8</th>
<th>0:0-1:0</th>
<th>1:0-1:2</th>
<th>1:2-1:10</th>
<th>1:10-4:0</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROTO INDEX</td>
<td>Eyes gaze follows another’s alteration in gaze orientation.</td>
<td>Pointing to objects without looking toward another, while moving them toward other.</td>
<td>Search for hidden objects upon request.</td>
<td>Recognition of absent objects but present anchor for absent reference.</td>
<td>Pointing and index to absent objects.</td>
</tr>
<tr>
<td>OBJECT INDEX</td>
<td>Gaze coordinated with reach following trajectory of objects.</td>
<td>Focus on object for self alone.</td>
<td>Unidirectional gaze toward another.</td>
<td>Gaze towards speaker more with absent than present reference.</td>
<td>Eidetic memory, dreams of objects and events.</td>
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<tr>
<td>SOCIAL UNIDIRECTIONAL INDEX</td>
<td>Eye gaze Coordinates with extending the arm and Hand in giving exchanges.</td>
<td>Unidirectional gaze toward another.</td>
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<td>JOINT SOCIAL INDEX</td>
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<td>INDEXICAL SYNCHRONY</td>
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*Table 1. Ontogeny of Index: Reference to Absent Objects*

1 Scaife, M., Bruner, J.S. (1975, p. 265).
6 Baldwin and Saylor (2005).
7 Bülher (1982, p. 27).
8 Baldwin et al. (2005).
9 Butterworth, George, Jarrett, Nichols (1991, p. 63)
10 Saylor (2004)
12 Ganea and Saylor (2007).
Firstness, not primarily in Secondness. Infants’ gaze trajectory at 2 months of age (following when another changes gaze direction) is not yet intentional (Scaife and Bruner 1975); nevertheless, the quality of Firstness does characterize their gaze pattern. But for apprehension of the signified (demonstrated in gaze following), the indexical nature of gaze trajectory is unlikely to materialize, underscoring the pivotal role of Firstness in the ontogeny of index and in its interpretants. The effect at this early developmental period is primarily emotional in that the impetus for the effect is based in idiosyncratic affect, i.e. notice of others’ change in gaze direction. “But no sign can have any significant effect beyond the emotional unless mediated by an emotional interpretant. After all, we must feel that we recognize the sign if it is to have any further effects on us” (Almeder 1980: 30).

Gaze following becomes indexical at 4 months of age (West 2010b) when gaze and reach coordinate in prehensile activity (Piaget and Inhelder 1969: 9). According to Piaget and Inhelder (1969: 10) this targeted reach represents intentional guided grasping such that the object to be grasped is not a consequence of accidental attainment, but of purposeful, measured extension of the arm toward the sought after object with the appropriate hand shape to orchestrate procuring it. Although the prehensile gesture graduates to indexical status, it nonetheless exceeds pure Secondness. Although Secondness is obviously illustrated by virtue of action on concrete co-existent objects, Firstness is present given initial notice of the object, for without Firstness in the form of perception and preference, notice of the object would be unlikely. Thirdness is likewise illustrated in the child’s use of a particular hand shape to receive/acquire the object; and recognition of types of hand shape toward successful attainment of different types of objects constitutes a general behavior type or habit (see Table 2).

Indexical gestures extend to pointing with the index finger (see Table 1) at 8 months of age (Bates 1976: 61, West 2010b) and extending

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2 For Peirce there are three kinds of interpretants: the immediate, the dynamic, and the final. The dynamic interpretant is the only true interpretant/effect. Because the immediate interpretant is the quality of the impression that the sign is “fit to produce,” and not the reaction itself, it only constitutes the potential of an effect, not the actual effect. The final interpretant is likewise hypothetical in that it represents that which finally would be decided to be the true interpretation were an ultimate opinion reachable. The only actual effect, which is based in secondness is the dynamic interpretant, since it is a direct effect which the sign actually produces on the interpreter (Almeder 1980: 28). Dynamic interpretants are categorized according to their degree of Firstness, Secondness, or Thirdness (see Table 2) as: emotional, energetic, and logical (CP 5. 475-6).
the hand and arm in giving and receiving exchanges at 9 months and thereafter (Carpenter, Nagel, Tomasello, Butterworth and Moore 1998: 681; Volterra, Caselli, Capirci, and Pizzuto 2005: 9). Indexical gestures at this stage are for ego alone, such that they are not concurrent with eye gaze toward another, nor mutual eye gaze exchange (Carpenter et al. 1998: 153). Moreover, indexical pointing indicates present objects only at this age; it does not yet refer to hidden/absent referents (see Table 1).

The interpretant of eye gaze coordinated with pointing is to establish and maintain spatial contiguity between co-existent directional sign and referent, underscoring its groundedness in Secondness. Again, Firstness and Thirdness represent necessary components of the sign-referent connection and of Peirce’s trianary relationship between sign, referent and interpretant. It is still ego who is the only Origo; and feelings/preferences of ego (Firstness) still motivate visual notice of objects (see Table 2). Recognition of similar attributes, e.g. size and shape, illustrates a component of Thirdness in the development of index in that objects of similar shapes/colors are classified together.

Between 1;0 and 1;2 search (gaze as index) for hidden referents upon other’s request materializes (see Table 1), although gaze toward another in the process of an indexical event does not rise to the level of joint attention (Baldwin and Saylor 2005). In fact, children’s gaze at this point in development is unidirectional, and is claimed to be more fre-
quent toward the speaker when speaker is referring to absent, rather than present, objects (Saylor 2004: 608). The presence of Secondness is obviated by a concurrent search for present objects. Likewise at this age eye gaze unites with arm extension to serve as index toward a coexistent referent. The developmental advance of apprehending that hidden objects likewise have substance, and that directional, intentional extended reach can access hidden objects, indicates the extension of index from coexistent sign with its referent to include some physical or spatial displacement between the two. The interplay of Firstness and Thirdness with Secondness here demonstrates that the ontogeny of index depends upon effects brought about by idiosyncratic, capricious and subjective motivations towards search and recognition of successful patterns, demonstrating the interplay between Firstness and Thirdness in the ontogeny of index.

At approximately 15 months of age children recognize absent objects (see Table 1); nonetheless, a present anchor is necessary for such recognition (Saylor 2004: 600). Recognition of absent referents at this age is restricted to familiar objects/people and more often materializes in the absence of familiar persons rather than familiar objects or unfamiliar persons (Baldwin and Saylor 2005: 136). Concurrently with recognition of absent objects appears a primary social competency, namely, joint gaze, which Saylor (2004: 608-609) consider to be a necessary skill in recognition of absent reference. Saylor (2004: 602-603) and Saylor and Ganea (2007: 698) claim that infants recognize absent objects upon sustained gaze toward a physical attribute (color/shape) of an object after its removal from a child’s environment; these mental representations can be held in memory for more than two minutes (Ganea and Saylor 2007). Index here graduates from a purely unidirectional ego-oriented instrument to a bidirectional, socially-based tool with which children initiate, receive and validate their attention to a non-present entity, whose physical and functional attributes are not apparent. Recognition of absent objects is the index which precedes reference, thus employing index to connect with a referent without existential contiguity. This stage represents the transition between purely physical coexistence of sign and referent (Peirce’s requirement for index) and a more symbolic relationship between index and object, which Jakobson accounts for.

Just prior to 2;0 children begin referring to present and absent objects by means of two indexes simultaneously (see Table 1), gesture in the form of pointing/gaze and single words (deictics such as demonstrative pronouns) (Clark 2009, West 2010, 2010a and 2010b). The function of these dual indices is such that neither wholly subsumes the other; in fact, one can serve as a scaffold for implementation of the other (McNeill and Duncan 2000). Semiotically, one of these indices can serve
as a more primary index to direct attention toward the use of the other index, e.g. pointing may precede the linguistic utterance, as well as establishing which object from among many is the intended referent. Firstness gives rise to the need/impetus/wish to disambiguate the intended referent for the addressee; and Thirdness materializes upon the realization that demonstrative and directional gestures can refer to any object of focus from the speaker’s perspective (West 2010, 2010a and 2010b). This particular interpretant consequent to Thirdness entails a gradual transition to inter-psychological/joint-social enterprises (West 2010). This graduation from ego only as Origo to other legitimate origos is but one illustration of the transcendence from ego-centered and unitarily ego-driven events and effects of events to an inter-psychological perspective in which events can have any number of agents and effects/interpretants can be experienced by multiple participants and non-participants alike.

Bühler and McNeill’s Contribution to Index

The actualization of eidetic memory during the preschool years represents another significant factor in the ontogeny of index and in the shift from inter-psychological to intra-psychological processes. The former (development of index) can be characterized as a gradual attenuation spatially and temporally between index and its referent, as well as among index, referent and interpretant. Bühler discusses the role of eidetic memory (vivid mental representations of experiences in which the child has participated or observed) in the development of deictic expressions, specifically as they proceed from “deixis ad oculos” to anaphoric use, and finally to “deixis am phantasma”. These deictic uses proceed from the perceptually apparent and contemporaneous use of deictics (perhaps accompanied by gesture) to purely linguistic indexing, to the use of memory to index actual experience. Deixis ad oculos conforms to Peirce’s notion of index as necessarily restricted to the co-occurrence of sign and referent; and Bühler’s anaphoric deixis extends only slightly beyond the limitation of existential relatedness to include co-linguistic indices (noun and pronoun) which are not visually apparent in speech and which are slightly attenuated temporally although within the same discourse. Bühler’s third most ontogenetically advanced use of deixis (am phantasma) encompasses sensorally (especially visually) poignant mental representations of the child’s experiences which serve as catalysts for the implementation of other more primary indices, such as the gestures already discussed and the productive use of deictic shifters. This imagination-based construction can include eidetic memory—vivid, detailed recall of visual images, which is apart from conventional or objective orientations and/or perspectives
Bühler (1934/1982: 28) indicates that two primary competencies underlie deixis am phantasma: the transition from egocentric to other centered orientations and the use of gesture to refer to “situational phantasms.” These phantasms/imaginations consist of mental “monologues” in which pointing still accompanies the cognition, especially when children are “lost” in their memory-based/imaginative constructions, subjectively generated. Bühler intimates that in this imagination-based state, children are so transported into “the reality” of their dreams that index (pointing) refers to the signified (people, objects, events) of subjectively constructed imagination and not to a coexistent referent in their physical space. Children’s early uses of deixis am phantasma may not be entirely free of restricted/ego-centered indexical reference in that their assumption, however unfounded, is that others likewise have access to their subjectively created imaginations, such that the referent of the index is present to the child speaker as a mental construct, as well as to the observer/addressee. This most advanced use of index illustrates synchrony between persons, objects and events, all of which serve as the objects of index individually, or as an aggregate, despite any physical displacement.

Although Bühler does not ascribe a particular age when these competencies develop, McNeill (1992: 297) and Karmiloff-Smith (1979) indicate a wide age-range for their ontogeny, between 2:0 and 5:0: “Children develop meanings to express relations between persons, objects, and events. These coalesce in the process of symbolization.” McNeill (1992: 297) characterizes this coalescence/symbolization to be “a gradual, greater arbitrariness, flexibility and increased contrastiveness.” To illustrate the ways in which language indexes and gestural indexes coalesce, McNeill (2005) describes their distinctive, but complementary, uses, such that the use of one serves as a scaffold for the use of the other. “Pointing and demonstratives are not redundant, i.e. they do not wholly overlap in function. Language does not (as a later development) supplant earlier gesture” (McNeill 2005: 38-39). Although these indices serve as indices in their own right, they likewise serve as indices for the other, pointing to the coexistence of/utility of the other (causally, existentially or both).

Bühler’s and McNeill’s perspectives demonstrate some extension of Peirce’s notion of index, from the purely physically coexistent relationship of index and referent to the coexistence of index and its mentally coexistent referent, namely, the subjectively created memory/image. This extension demonstrates a transition between a more factual use of index to a more learned/symbolic one.
Jakobson’s Contribution to Index

According to Jakobson (1987), contiguity between indexical sign and its referent can be of two types: factual or symbolic: “The structure of symbols and indexes implies a relation of contiguity (artificial in the former case, physical in the latter)”. While symbols are learned contiguity, indexes are a consequence of “factual, existential contiguity” (Jakobson 1987: 468). In other words, symbolic signs do not necessarily coexist spatially with their referent. Hence, contiguity relations which hold between symbolic sign and referent draw upon conventional meanings in the mind of the user, constituting an “intellectual operation” according to Peirce and not primarily an indexical one. Although the relationship between symbolic sign and referent is more covert, and that between the indexical sign and its referent is more overt, Jakobson contends that index can still operate to refer to more covert referents, especially in the case of deictics, which are indexical symbols. The presence of contiguity appears to be the primary defining component connecting indexically-based signs to their referents, especially degenerate indexical signs; hence, signs which are actualized apart from their objects spatially (as in the case of deixis am phantasma) nonetheless constitute indices. Jakobson is not specific with respect to whether the contiguity that must hold between index and referent is spatial, temporal, or both, though he intimates that any attenuation between indexical sign and its referent can be spatial, perhaps not temporal. Jakobson’s distinction between learned contiguity and factual/existential contiguity contrasts indexical signs, which are associated with learned or intellectual mental objects, from those associated with physically present referents. Both types of contiguity demonstrate that the indexical sign and its referent materialize simultaneously and are temporally contiguous, despite their spatial attenuation, namely, indexical sign referring to object, not sensorally apparent, but in the mind of the producer. Jakobson extends Peirce’s definition of index as necessarily existentially present with its object to indices whose objects are not observable—recalled experiences, subjective cognitions and imaginations.

Conclusion

Jakobson’s, Bühler’s, and McNeill’s contributions to the ontogeny of index and to its parameters of use are invaluable. They create the possibility to regard reference to absent objects/cognitions as indexical, despite the use of pointing and other gestural indexes to non-present objects. Jakobson’s characterization of index as having a contiguity relationship with its object permits further application of index to absent objects, not merely physically-present ones, but mental constructs/
memories as well. These mental referents of indices initially are vivid memories of actual experiences on the part of ego (Bühler 1934/1982: 28). Jakobson (1987: 468) supports the categorization of memories as objects of indices in view of their temporal contiguity, despite their lack of physical contiguity.

With the inclusion of certain mental operations as objects of indices, Jakobson transcends the Peircean notion of index in demonstrating that a clear line cannot be drawn between index and symbol. Nevertheless, Jakobson’s use of index as requiring a degree of contiguity between sign and referent can be further extended to encompass cognitions/perspectives which have not been experienced by ego, but observed, and even further to older children’s imaginings of events that have never been experienced or observed, but subjectively created. Such possible worlds, when accompanied by indexical signs (eye gaze, pointing, and/or use of deixis) if affectively charged by Firstness, can constitute objects of indices given temporal contiguity between sign and referent.

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