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FOREWORD

With this volume the *Kansas Working Papers in Linguistics* marks its first decade of publication. The editors are bringing out Volume 10 in two numbers, the first of which is devoted to theoretical issues, general linguistics, and old-world-language topics. Volume 10, number 2 is the fourth in the *Studies in Native American Languages* series.

Volume 10, number 1 is comprised of papers on topics as diverse as the theory of the sign, the comparison of language-specific entailment systems, and motherese in modern Greek. Much of the work represented here is quite original, and has seen little discussion before (Greek motherese, Igbo proverb and Idiom).

The editors wish to thank all the contributors, both those whose papers appear in Volume 10, number 1, and those whose papers we did not include. We wish also to thank the faculty of the Linguistics Department of the University of Kansas for their support and encouragement for the *KWPL* throughout the year.

RWL

PEIRCE'S CONCEPT OF THE INDEX:
The Need for a Fourth Sign

Dale E. Woolley

Abstract: The purpose of this paper is to examine C.S.
Peirce's concept of the indexical sign, to show that it
is inadequate to account for the 'indexical' properties
of language, and to propose a modification of that con-
cept. After a brief review of Peirce's semiotic theory,
it is established that Peirce subsumed two related, but
fundamentally incompatible kinds of signs as indices.
These types of indexical signs are distinguished by dif-
fering relationships between the signs themselves and
what they represent. It is then shown that both types
of indexical signs are found in language, and, conse-
quently, that a fourth sign should be recognized.

It is generally assumed that a defining characteristic of language
is the arbitrary nature of the linguistic sign, a view that derives in
modern times at least from William Dwight Whitney and Ferdinand de
Saussure. The Saussurean position that the signifiant is linked to the
signifié by convention has, however, been criticized by some linguists
(cf. Jespersen 1922; Benveniste 1939; Bolinger 1949; Spang-Hanssen 1954;
Engler 1962 1964; Jakobson 1965; Valesio 1969; Wescott 1971; Anttila
1972), who have pointed out a number of non-arbitrary properties in
language.

Jakobson (1965) introduced the linguistic community to the semio-
tic theory of Charles Sanders Peirce and demonstrated its usefulness in
understanding the nature of the linguistic sign. Peirce developed his
theory over a number of years, presenting parts of it in publication
and parts in personal communication, and leaving parts of it in manu-
script. Burks (1949), Fitzgerald (1966), and Greenlee (1973) discuss
Peirce's semiotic theory from a philosophical standpoint. Jakobson
(1965), Wescott (1971), Anttila (1972), and Gamkrelidze (1974) discuss
the theory from a linguistic standpoint.

For the purposes of this paper it is unnecessary to outline Peirce's
entire theory of signs: that task has been undertaken by such authorities
as those just cited. Peirce follows Stoic tradition in distinguishing
between the material qualities of a sign; its form (the traditional sig-
nans or Saussure's signifiant), and it meaning (the traditional signatum
or Saussure's signifié).

Actually Peirce talks about the object, the sign, and the interpre-
tant. Peirce distinguishes between a dynamical object and an immediate
object. With respect to language the dynamical object is a property of
the real world, presumably including also 'realities' of the human mind,

i.e. emotional states, the world of conjecture, imagination, dreams, fantasy, the possible, etc. The immediate object is part of the sign itself and for Peirce reposes in the mind. Likewise, Peirce discusses an immediate, a dynamical, and a final interpretant. Exactly what he intended by this trichotomy is unclear:[2] the immediate interpretant, like the immediate object, is apparently a part of the sign; for language, the interpretant as a whole also reposes in the mind, as Burks (1949: 673) notes.[3] The sign mediates between the immediate object and the immediate interpretant, and all three taken together may be compared to Saussure's linguistic sign.

Peirce's insight was in perceiving that there exist three fundamental relationships between signans and signatum. He labeled these relationships indexical, iconic, and symbolic, and on that basis established a three-fold classification of signs into index, icon, and symbol. Commentators on Peirce have not been entirely consistent in interpreting just what he meant by those terms.

Peirce is clearest in his discussion of the symbol, and here his commentators are generally in agreement. A symbol is a sign in which the signans is linked to the signatum through a learned, conventional association, not dependent on any likeness or other relationship between signans and signatum. A symbol is in other words an arbitrary sign, and it is in this sense that the words of a language are ordinarily taken to be symbols.

But Peirce is less lucid in his explanation of the index and icon, and, consequently, his explicators disagree on details. For Peirce an index is a sign in which the signans is necessarily linked to the signatum by one or more contiguities: factual, physical, spatial, temporal, causal, or existential.[4] The classic example is the relationship between smoke and fire. Under ordinary conditions, smoke is produced during combustion and is factually, physically, spatially, temporally, and existentially contiguous with the fire. An interpreter may infer the existence of the fire by regarding the smoke as a sign. Smoke is therefore an index of fire.

For Peirce an icon is a sign in which the signans is linked to the signatum through noncontiguous factual or formal similarity or resemblance. Some or all of the characteristics of the object are reflected in the sign. Put another way, the form of the sign is derived by principle from the form of the object.[5] Thus a map is an icon: it is not a piece of terrain, but rather a geometric representation of that terrain. Or a photograph is iconic because optical principles convert a three-dimensional object into a two-dimensional array of black and white.

No notion discussed by Peirce can be understood without at least a rudimentary acquaintance with his system. There is general accord that Peirce aspired to develop a comprehensive, coherent, and systematic philosophy, although scholars disagree whether he was successful.[6] All phenomena for Peirce can be characterized in terms of three fundamental relations:

monadic, dyadic, and triadic. Phenomena so characterized are called mo-
nads, dyads, and triads. A monad is a phenomenon without relation to
other phenomena; a dyad is a relation between two phenomena; and a triad
is a relation among three phenomena. For Peirce polyads are reducible
to triads. From these relations follow directly the categories of first-
ness, secondness, and thirdness. Furthermore, the categories may them-
selves interrelate in accordance with the basic phenomenological princi-
ple: firsts may determine only firsts; seconds may determine seconds or
(degenerately) firsts; thirds may determine thirds or (degenerately)
seconds or firsts. Peirce distinguishes between genuine and degenerate
relations. A genuine relation holds between or among categories of the
same rank, for instance two seconds; a degenerate relation between or
among categories of higher and lower rank, for example a third and a
first.[7]

The theory of relations and categories provides the basis for the
division of signs into icons, indexes, and symbols. Icons are monads,
indices are dyads, and symbols are triads, or, put another way, icons
partake of firstness, indices of secondness, and symbols of thirdness.
'An Icon is a Representamen[i.e., sign] whose Representative Quality
is a Firstness....' (2.276)[8] Since 'firstness is the mode of being of
that which is such, as it is, positively and without reference to any-
thing else' (8.328),

> An Icon is a sign which refers to the Object that it denotes
> merely by virtue of characters of its own, and which it pos-
> sesses, just the same, whether any such Object actually
> exists or not. It is true that unless there really is such
> an Object, the Icon does not act as a sign; but this has no-
> thing to do with its character as a sign. Anything whatever...
> is an Icon of anything, in so far as it is like that thing and
> used as a sign of it. (2.247)

And 'an icon is a representamen [i.e., sign]...by virtue of characters
which belong to it in itself...and which it would possess just the same
were there no object in nature that it resembled, and though it never
were interpreted as a sign.' (4.447) Thus an icon, as a monad, exists
independently of either an object or an interpretant.[9] 'An Index...is a
Representamen whose Representative character consists in its being an
individual second.' (2.283) Hence 'an index is a sign which would, at
once, lose the character which makes it a sign if its object were removed,
but would not lose that character if there were no interpretant.' (2.304)
Thus an index, as a dyad, is necessarily related to an object, but is
independent of an interpretant. This relation is to the object rather
than to the interpretant as a consequence of the basic phenomenological
principle, because an object is a second, while an interpretant is a third.[10]
Finally a symbol, as a third, is triadically related to both an object
and an interpretant.

It is the purpose of this paper to examine critically Peirce's concept of the index, to show that it is inadequate to account for the 'indexical' properties of language, and to propose a modification of that concept.

To begin, the argument in this paper is that difficulties in understanding Peirce's concept of the index stem from his attempt to subsume two related, but fundamentally incompatible kinds of signs as indices. From the standpoint of the categories, the difference between these kinds of signs involves the relationship between object and sign. For one kind of sign, the object may be said to determine the sign; for the other, the sign may be said to determine the object.

It has been established above that the index, as a dyad and partaking of the category of secondness, stands in a genuine relation to its object, also a second. Now by the basic phenomenological principle whereby seconds may determine seconds, it follows that the object can determine its index. A series of definitions, descriptions, and explanations of the index corroborates this deduction. 'An Index is a sign which refers to the Object that it denotes by virtue of being really affected by that Object' (2.248). It is also 'in dynamical...connection' with its object (2.305). Object and index may also be related through action (2.284, 6.471), cause (2.286), or the forces of nature (2.286). In these instances the object clearly determines its index, since it affects the index through action or force. Less unequivocal are cases in which the object and index are related through a direct physical connection (1.372, 2.299), existential fact (4.447, 4.500, 4.531), or reality (2.286, 3.361, 4.531). Nonetheless, in every case just presented, the existence of the object implies the existence of the index: therefore it is accurate to say that the object determines its index in these cases.

For a large number of signs proffered as examples of indices, such as footprints, smoke, barometers, weathercocks, plumb bobs, and symptoms, it would appear that the object determines its index. But another kind of sign, namely pointing, presents difficulty. The object of pointing, Peirce claims, is the thing pointed to. Clearly, an act of pointing is a sign, but what kind of sign? Surely, neither symbol nor icon. If Peirce is to maintain his comprehensive trichotomous system, then pointing as a sign must be indexical (3.361). Such signs are indices for Peirce because the act of pointing establishes one or more of dynamical, spatial, physical, actual, factual, existential, or real connections with the object pointed to. Stated another way, the sign now determines its object. Furthermore, since inherent in the act of pointing is the intention to direct attention of some one toward some thing, the index comes to be defined with respect to its effect on an interpretant or interpreter. So, for example, an index is in 'dynamical (including spatial) connection...with the senses or memory of the person for whom it serves as a sign' (2.305) and shall direct the hearer's attention to an object (2.336). It is 'designed to stimulate the person addressed to perform an act of observation' (4.158). It forcibly intrudes upon the mind (4.447). Moreover, 'anything which

focusses the attention' or 'startles us' is an index. (2.285)[11]

Subsumed under the index, then, is a set of signs with quite dif-
ferent characteristics. On the one hand, there are signs which exist
necessarily because their objects exist. They are determined, in
Peirce's sense, by their objects. They are genuinely dyadic because
their objects determine them, and they, in turn, refer to their ob-
jects. Their existence is independent of any interpretant; they stand
however, ready for interpretation, should the occasion arise. Put
another way, they are not encoded, but they may be decoded. On the
other hand, there are those signs which are intentionally encoded so
as to influence their interpretants or interpreters. It would be more
accurate also to regard these signs as determining their objects,
rather than being determined by their objects.

The consequence of identifying these two types of signs as
indices is an inconsistency in Peirce's categorical methodology. From
an examination of the icon and the symbol, it can be shown that it is
the sign which determines the object in Peirce's methodology. (The
icon, it will be recalled, is a first; the symbol, a third; the object,
a second; and the interpretant, a third.) Consider first the possible
case in which the sign determines its object: By the basic phenomeno-
logical principle, the icon, as a first, cannot determine the object, as
a second. The symbol, as a third, however, determines both the inter-
pretant, as a third, and the object, as a second. Thus the icon stands
independent of both object and interpretant, whereas the symbol is tri-
adically related to both. Consider now the second possible case: if it
were the object which determined the sign, then the object, as a second,
would determine the icon, as a first, but could not determine the symbol,
as a third. Thus icon and object would be associated, and the symbol
would stand alone. Since it is the first case which in fact holds (i.e.
that in which the icon is independent of, but the symbol is related to,
both object and interpretant), rather than the second, it follows that
the sign determines the object.

Now, if the sign determines the object, it must be the second kind
of sign discussed above, namely pointing, which constitutes a proper
index. This is perhaps why Peirce regards a pointing finger as the
archetypal index (3.361). Consistent categorical methodology would,
therefore, as a consequence, rule out signs of the first type, (i.e.
those in which the object determines the sign, such as smoke), as
indices.[12]

Before proposing a revision to remedy this inconsistency, it will
be profitable to survey the kinds of indexical properties found in
language. It is not the intention here to develop a formal analysis of
these properties,[13] but rather to show the basic types displayed in
language. In the first place, in any utterance the speech signal itself
conveys a great deal of information apart from what is ordinarily taken

as the meaning of the utterance. This information pertains principally
to the identity of the speaker. Such characteristics as the speaker's
geographical home (where he comes from), his social and educational status,
his occupation, his roles in society, his age, sex, physical appearance,
ethnicity, physical, mental, or emotional state, and personality are
conveyed in the speech signal (Laver and Trudgill, 1979).[14] Every time
a person speaks, the resultant sound waves, in addition to conveying the
linguistic message, necessarily contain clues to that person's 'being'.
The person does not intentionally encode this information, but it is
available for decoding. Just as the wind affects a weathercock by posi-
tioning it, and its position can then be interpreted to extract informa-
tion about the wind, so a speaker's 'being' affects his speech, which
can then be interpreted to identify the speaker. As Abercrombie (1967)
was first to note, the relation between a person's 'being' as object and
his speech as sign is indexical.

A second kind of indexical sign characteristic of language is that
class variously called 'shifters' (Jespersen, 1922), 'egocentric particu-
lars' (Russell, 1940), 'token-reflexives' (Reichenbach, 1947), or 'index-
ical expressions' (Bar-Hillel, 1954). For Jespersen, shifters are words
'whose meaning differs according to the situation' (p. 123). Personal
pronouns are the conspicuous example. Since I is the person speaking,
its referent shifts from utterance to utterance. Other examples commonly
cited are demonstratives, (e.g. this, that), adverbs of place and time
(e.g. here, there, now, then, yesterday, tomorrow), and verb tenses. For
Russell what these denote is relative to the speaker; for Bar-Hillel their
reference is dependent on the 'pragmatic context of their production'
(p. 359). In order to understand the referent of I, then, there, and you,
one must know who speaks, when, where, and to whom.

In the cases just discussed the sign 'indicates its object directly...
I refers directly to the speaker. I means 'the person uttering I' (Burks
1949: 678). A third, related kind of indexical sign refers to its object
through reference to a mediating sign, or, put another way, indicates its
object by reference to another sign for the object. Examples are anaphoric
and relative pronouns, which denote by reference to their antecedents.
Another interesting example, first mentioned by Peirce (2.287) and later
examined by Anttila (1975), involves affixation. Peirce claims that
grammatical constructions of concord or agreement are indexical. The
affixes on words which are in concord are indexically related, for such
affixes, as signs, stand for their objects not directly, but by reference
to another sign. In the Latin sentence puellae sunt bonae, the number and
gender specification on the adjective is meaningful only through association
with the affix on the noun. That association is established by contiguity.
Concord 'acts as a force carrying the attention from one occurrence of
[an affix] to the previous one' (2.287). Antilla argues that allomor-
phic variation is likewise indexical. The allormorph /ʧild-/ in child-
ren, for example, is already marked for plural because of its indexical
(i.e. pointing) association with the plural affix /-rin/. In other
words, the situation here parallels that existing in the Latin example above.

The last kind of indexical sign to be mentioned here was first re-
cognized by the writer at a baseball game. The vendor's Hey! Fresh
salted peanuts! involves an index. The object of the sign 'hey!' is
the message to follow: 'fresh salted peanuts'. The sign directs the
attention forcefully to the message. It is meaningless, or at least
lacks purpose, without the message. Another example is the call of
the London crier oyez /oyey/, or the colonial hear ye, hear ye.

Of the four types of signs, putatively indices, just discussed,
the first (i.e. the speech signal apart from its linguistic content)
has been shown to be clearly indexical. For Peirce the other three
would also be regarded as indices because they are inseparable from
their objects, they point to their objects, and they direct or focus
the attention of the interpretant or interpreter onto their objects.
The claim that 'the pronoun, which may be defined as a part of speech
intended to fulfill the function of an index, is never intelligible
taken by itself apart from the circumstances of its utterance' (5.153),
confirms Peirce's understanding of shifters. Asked for a location by
B, 'if A's reply is, "Within a thousand yards of here," the word "here"
is an index; for it has precisely the same force as if he had pointed
energetically to the ground between him and B' (2.305). Finally '...
the index...like a pronoun, demonstrative, or relative, forces the
attention to the particular object intended without describing it' (1.369).

These last three types of signs, however, differ from the first, in
precisely the same way that the two types of signs subsumed as indices
in general, and discussed earlier in the paper, were shown to differ.
In contradistinction to the speech signal as sign, these signs are in-
tentionally encoded so as to determine their objects by pointing to them
and thereby to force attention to them. The evidence from language,
then, together with inconsistency in Peirce's concept of the index,
urges revision in that concept: two basic sign types should be recognized.

Woolley (1977) suggested that the icon, index, and symbol could
be characterized by two fundamental properties or features of signs,
abstractness and arbitrariness. Arbitrariness is taken in the sense
that it ordinarily has in discussions about language and needs no further
elaboration. A sign is abstract if it can exist independent of its object;
a sign is nonabstract if it is necessarily linked to its object. The
features are binary. Thus the icon is abstract and nonarbitrary, the sym-
bol is abstract and arbitrary, and the index is nonabstract and
nonarbitrary. Two binary features, however, imply four categories.
Missing is the category nonabstract and arbitrary. Just these feature
values characterize the second type of index analyzed in this paper.
Since a salient property of this type is its pointing function, an ap-
propriate name for this fourth sign is deictic.[15] True indices, such
as smoke or the speech signal apart from its linguistic meaning, are
nonabstract since they are in fact produced by their objects. Without
the existence of the object there can be no index. They are nonarbi-
trary because their character is fixed by the natural relation to their

objects. Deictics are nonabstract because they are pointers. An act
of pointing is without significance if there is not something pointed
to. Deictics found in language are conspicuously arbitrary. There is
no reason why a person's 'self' should be expressed by <u>I</u> or <u>me</u> in
English rather than by other equally arbitrary phonetic sequences.
Deictics outside language are perhaps less obviously arbitrary, but,
at least in part because they are encoded, they have a conventional
aspect. Pointing, after all, does not have to be effected with the
fingers. A thrust of the head, a fixed gaze, or pouted lips could
work just as well.

Furthermore, this analysis of signs reveals directly the inner
relationship among these signs, especially when expressed in binary
notation as shown in figure 1 below. The index and symbol, and the
icon and deictic, are polar opposites. The index and icon are related
through necessity to the object.[16] The index and deictic are related
through contiguity with the object. The icon and symbol are related
through independence from the object. And the deictic and symbol are
related through conventional association with the object.

	Abstract	Arbitrary
Index	-	-
Icon	+	-
Deictic	-	+
Symbol	+	+

Figure 1: Analysis of Signs

NOTES

1. For a fuller treatment of this point, see Jakobson (1965) and
Gamkrelidze (1974).

2. 'I have already noted that a Sign has an Object and an Interpretant,
the latter being that which the Sign produces in the Quasi-mind that is the
interpreter by determining the latter to a feeling, to an exertion, or to a
Sign, which determination is the Interpretant. But it remains to point out
that there are usually two Objects, and more than two Interpretants. Namely,
we have to distinguish the Immediate Object, which is the object as the sign
itself represents it, and whose Being is thus dependent upon the Representa-
tion of it in the Sign, from the Dynamical Object, which is the Reality

which by some means contrives to determine the Sign to its Representation. In regard to the Interpretant we have equally to distinguish, in the first place, the Immediate Interpretant, which is the interpretant as it is revealed in the right understanding of the Sign itself, and is ordinarily called the meaning of the Sign; while in the second place, we have to take note of the Dynamical Interpretant which is the actual effect which the Sign, as a Sign, really determines. Finally, there is what I provisionally term the Final Interpretant, which refers to the manner in which the Sign tends to represent itself to be related to its Object. I confess that my own conception of this third interpretant is not yet quite free from mist.' Peirce, Collected Papers, 4.536 (i.e., vol. 4, paragraph 536).

3. For an extended discussion of Peirce's notion of interpretation, see Fitzgerald (1966: 71-90) and Greenlee (1973: 99-131).

4. Burks (1949) has argued unconvincingly that causal relationships are not indexical, but in the opinions of Fitzgerald (1966) and Gamkrelidze (1974), they are.

5. Burks, and after him, Fitzgerald have pointed out that since the principle by which the icon has been derived from its object must be known by the interpreter if the icon is to be understood, and since in theory any principle or set of principles could have been used to derive the icon, there is thus a convention established by which the icon is to be interpreted, and there exist therefore no pure icons. But for Peirce principles of the sort which may relate objects to signs, in fact mathematical principles in general, are the essence of iconicity, and the term 'conventional' implies arbitrary agreement without principle. Gamkrelidze also failed to understand this point, and, as a result, he sees no iconic properties whatsoever in language.

6. For example, the two standard explications of Peirce's philosophy (Feibleman, 1946 and Goudge, 1950) present contradictory positions. Feibleman's aim is 'to exhibit the system which seems to be inherent in Peirce's philosophy' (p. xvii), while Goudge is 'convinced that no such whole exists ...'(p. vii).

7. It is not necessary in this paper to undertake a systematic explanation and exemplification of Peirce's relations and categories, described variously as 'notoriously obscure' (Greenlee, 1973, p. 8), 'full of obscurities, complications, and apparent contradictions' (Savan, 1977, p. 189), etc. Freeman (1934), Feibleman (1946), Goudge (1950), Fitzgerald (1966), and Greenlee (1973) assay the territory. Rather the paper will show how certain aspects of Peirce's semiotic theory derive from these relations and categories, and incidentally introduce explanation of them as necessary.

8. Vol. 2, paragraph 276. It is customary to refer to Peirce's Collected Papers by citing volume and paragraph numbers.

9. One might well ponder this paradox. How can an icon be a sign and

exist independently of either object or interpretant? Peirce extricates himself from the dilemma by distinguishing between the sign in and of itself and the sign in action. But this distinction is not made for the index or symbol. Here Peirce's commitment to the categories has forced him into specious reasoning.

10. And the sign, of course, is a first. 'A Sign... is a First which stands in such a genuine triadic relation to a Second, called its Object, as to be capable of determining a Third, called its Interpretant, to assume the same triadic relation to its Object in which it stands it- self to the same Object.' (2.274) This contention presents a number of thorny problems. For instance, what does Peirce mean by 'determine'? Ordinarily the higher numbered categories determine the lower numbered categories. Here a first and second determine a third. Further discus- sion is beyond the scope of this paper.

11. For a more detailed discussion, albeit in a different context, of Peirce's shift in emphasis from the object to the interpretant, see Greenlee (1973: 84 ff.)

12. That Peirce was himself uneasy with his conception of the index is evidenced in a number of discussions in the Collected Papers. For instance, in one discussion (5.75) Peirce attempts to divide indices into those with dualistic association with their objects and those with only factual association. The examples are a hygrometer and a pointing finger, respectively. A hygrometer's connection with weather is dualistic: the weather affects its readings, and its readings convey information about the weather. Whereas, a pointing finger just identifies whatever pointed to. Or in another discussion,

> An index represents an object by virtue of its connection
> with it. It makes no difference whether the connection
> is natural, or artificial, or merely mental. There is,
> however, an important distinction between two classes of
> indices. Namely, some merely stand for things...while
> others may be used to ascertain facts. (8.368, n. 23).

Examples of the former class, termed designations, include pronouns; and, of the latter class, called reagents, a sort of litmus paper. But this description of the index expands its scope to encompass virtually all signs.

13. Burks (1949), Bar-Hillel (1954), Abercrombie (1967), Lyons (1977), and Laver and Trudgill (1979) essay in this direction.

14. A large body of research has shown the remarkable accuracy with which listeners can infer these characteristics. Laver and Trudgill (1979) and Siegman (1978) review this research.

15. The use of the adjective as a noun is intentional.

16. 'In so far as the Index is affected by the Object, it necessarily has some Quality in common with the Object....It does, there-fore, involve a sort of Icon, although an Icon of a peculiar kind; and it is not the mere resemblance of its Object, even in these respects which makes it a sign, but it is the actual modification of it by the Object' (2.248).

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