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# Commentary on "The strategic formulation of abductive arguments in everyday reasoning"

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## 1. Introduction

Henrike Jansen's "The strategic formulation of abductive arguments in everyday reasoning" insightfully explores the terrain of abductive argumentation. The purpose of this note is to continue the exploration along lines marked out by her paper. This further exploration proceeds in two stages. Section 2 of the paper addresses the nature of abductive inference by distinguishing two types of abduction, identifying some of abduction's formal and nonformal properties, and relating abduction to enthymematic inference. Section 3 focuses on some of Jansen's examples, paying particular attention to the distinction between abduction and argument from sign. Whereas Jansen maintains that some arguments from sign are not abductive, the paper suggests an alternative perspective from which arguments from sign can generally be viewed as one sort of abductive inference.

## 2.  What is abduction?

Although the concept of abduction is notoriously hard to pin down, there is considerable consensus on some of its formal and nonformal properties. The most widely agreed-upon nonformal property is that abduction is an inference from some supposed fact to an explanation of that fact. Jansen, for example, states that abductive arguments are "generally known as arguments in which the premise states an observed fact and the conclusion offers an explanation for that fact." This coheres well with statements by C. S. Peirce, who defines abduction as "the process of forming an explanatory hypothesis" (Hartshorne and Weiss, p. 106), and by Atocha Aliseda, who notes that abduction is "thinking from evidence to explanation" (Aliseda 2006, p. 28).

The formal properties of abduction can be specified with reference to Lorenzo Magnani's distinction between creative abduction, which generates possible explanations, and inference to the best explanation, which evaluates explanations (Magnani, p. 19). However, Jansen observes a parallel distinction between generative abduction and selective abduction, and I will adhere to her terminology here.

As Jansen notes, the structure of generative abduction is often compared to the invalid pattern of affirming the consequent:

> If *p*, then *q*.
> *q*.
> Therefore *p*.

The dominant approach to conceptualizing generative abduction, often referred to as the AKM model (Woods, p. 305), includes a schema that does indeed instantiate this structure.[1] The schema will be presented here in a simplified form derived from John Woods (Woods, pp. 305–306). Given a true sentence *e*, a knowledge base *K*, a hypothesis *h*, and the revision *K(h)* of *K* by *h*, the schema can be stated as follows:

> *e*.
> If *K(h)*, then *e*.
> Therefore *K(h)*.

Note that some formulations of the AKM approach normally take the conditional in the second premise to be deductive consequence, but it may also be interpreted as inductive consequence or statistical consequence (Aliseda 2007, p. 38).

Since the AKM schema says nothing about *K(h)* being the best explanation, it obviously will not do for selective abductions such as inference to the best explanation (IBE). However, John Josephson, who identifies abduction with IBE, proposes the following schema (Josephson, pp. 1-2, 11):

> *e* is a collection of data (facts, observations, givens).
> *h* explains *e* (would, if true, explain *e*).
> No other hypothesis can explain *e* as well as *h* does.
> Therefore, *h* is probably true.

This schema will be taken to represent IBE in the following pages.

Because AKM proponents like Aliseda take the 'If … then' of their schema to be explanatory, the AKM schema and the Josephson schema are quite similar; the main difference is the additional "No other hypothesis…" premise in the Josephson schema. Josephson links this premise to disjunctive syllogism, which he schematizes as follows (Josephson, p. 9):

> *P* or *Q* or *R* or *S* or …
> But not-*Q*, not-*R*, not-*S*, …
> Therefore, *P*.

Consequently, IBE can be viewed as a kind of enthymeme. The "No other hypothesis …" premise summarizes a disjunctive syllogism.

Although disjunctive syllogism is deductively valid, Josephson observes that its employment in support of abductive inference does not usually inspire full confidence:

> Moreover, the support for an abductive conclusion fits this form if we assert that we have exhaustively enumerated all possible explanations for the data and that all but one of the alternative explanations has been decisively ruled out. Typically, however, we will have reasons to believe that we have considered all plausible explanations (i.e., those that have a significant chance of being true), but these reasons stop short of being conclusive. We may have struggled to formulate a wide variety of possible explanations but cannot be sure that we have covered all

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[1] Woods explains that the term 'AKM' is "a loose convenience at best."

plausibles. Under these circumstances we can assert a proposition of the form of the first premise of the syllogism, but assert it only with a kind of qualified confidence. Typically, too, alternative explanations can be discounted for one reason or another but not decisively ruled out. Thus abductive inferences, in a way, rely on this particular deductively valid inference form, but abductions are conclusive only in the limit. (Josephson, pp. 9-10)

So even though disjunctive syllogism is valid, the premises it deploys in support of abduction are typically dubious to a significant degree. They might very well turn out to be false.

To conclude this section, I will note that the AKM and Josephson schemata stand rather differently with respect to Peirce's original schema for abduction (Hartshorne and Weiss, p. 117):

The surprising fact, *C*, is observed.
But if *A* were true, *C* would be a matter of course.
Hence, there is reason to suspect that *A* is true.

The AKM schema can be criticized for omitting the subjunctive element in Peirce's second premise. In fact, as Woods has pointed out (Woods, p. 307), this is a principal motivation for Gabbay and Woods' rival GW model of abduction (Gabbay and Woods). By contrast, the Josephson schema, at least in its initial formulation (Josephson, pp. 1–2), includes an alternative subjunctive formulation of its second premise.

## 3. Abduction and argument from sign

Jansen's paper includes a rich offering of everyday abductive arguments. Her examples (1) – (4) all contain sentences that approximate the "No other hypothesis…" premise of the Josephson schema:

from (1): How else do you explain why he would choose ugly Leanne over gorgeous Brandi.
from (2): [W]hy else would we have different faces other than to advertise our nature?
from (3): Surely there can be no other reason for keeping this fool in one of the top jobs.
from (4): How otherwise would it be passed on?

As Jansen points out, these sentences all figure in arguments that appear to be instances of IBE. Hence the overall structure of these arguments seems to be adequately captured by the Josephson schema.

Nevertheless, Jansen subjects three of these four arguments to closer inspection, and she concludes that they are not really abductive at all. The arguments are as follows:

(2)   … the clues of a person's nature can be found in her/his face. [W]hy else would we have different faces other than to advertise our nature?

(3)   [British PM] Cameron swears that the restaurant wrecking happened on nights when he wasn't there. I expect that Gideon [Chancellor of the Exchequer

George Osborne] knows different, and possibly even has some pictures to prove it. Surely there can be no other reason for keeping this fool in one of the top jobs.

(4) The American Medical Bulletin recently stated that every teenage girl who has had sex, needs to be tested for Chlamydia every six months for five years. Why are only girls tested? Boys get it too. How otherwise would it be passed on?

Jansen supports the conclusion that (2), (3), and (4) are not abductive by relying on her previously cited definition of abduction: "arguments in which the premise states an observed fact and the conclusion offers an explanation for that fact." She claims that these arguments "don't seem to be the result of a fact needing an explanation at all. Instead, they convey the impression that the arguer was already convinced of his/her standpoint and needed evidence to support it." She reclassifies (2), (3), and (4) as arguments from sign: the premise refers to a sign that provides evidence for the conclusion.[2]

In addition, Jansen applies an analysis of the same sort to a fifth argument:

(5) Many psychologists are afraid of their own shadow. They're unwilling to confront their dark side. They may be smart but they're lacking in consciousness. How else can we explain the third-rate knowledge that the profession passes along to a suffering world.

Despite appearances, Jansen maintains that this is not an abductive argument either, for the premise on the professional quality of most psychologists is not a view that is generally accepted. She concludes that (2), (3), (4), and (5) are "straightforward arguments from sign containing a dubious premise."

There is much to learn from Jansen's analysis of these arguments. But I would like to suggest an alternative point of view from which these arguments can be understood as abductive after all. This alternative can be supported by at least three considerations. The first is that, as Jansen notes, abduction and argument from sign are not mutually exclusive categories. She cites Douglas Walton's example of an argument from sign that is clearly abductive: "here are some bear tracks in the snow, therefore a bear recently passed this way" (Walton, p. 42). The premise cites the sign of the bear tracks; the conclusion offers an explanation of the sign.

Secondly, abduction can be defined without insisting on full-fledged factuality. Some definitions do not mention factuality at all. Peirce's definition, already quoted in Section 2, is simply "the process of forming an explanatory hypothesis" (Hartshorne and Weiss, p. 106). Alternatively, Walton's definition states "An abductive inference goes backward from a given conclusion to search for the premises that conclusion was based on" (Walton, p. 34). Other treatments permit the reasoner to *take* a proposition as factual without it necessarily being factual. For example, Peirce's schema for abduction, also quoted in Section 2, refers to fact in the first premise, but does so from the reasoner's point of view: "the surprising fact." Hence the premise can be understood as a statement of belief that may or may not be true. Similarly, the reference to data in the first premise of the Josephson schema can be interpreted objectively, as factual, or subjectively, as believed to be factual.

Finally, the two following questions should be clearly differentiated:

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[2] Aristotle appears to have initiated the study of argument from sign. See, for example, *Prior Analytics* II 27 and *Rhetoric* I 2 1357a33–b21.

a) Are (2), (3), (4), and (5) abductive arguments?
b) Are (2), (3), (4), and (5) good abductive arguments?

The factuality of the data corresponding to the first premise of the Josephson schema is undeniably relevant to b), but it is arguably irrelevant to a). For if we take our cue on abduction from the Peirce and Walton definitions in the previous paragraph, IBE can begin from a mere belief that something is true—a belief that may be true or false.

I suggest, then, that someone whose initial impression is that (2), (3), (4), and (5) are abductive need not abandon it. These arguments attempt to explain something, and the explanation has the form of IBE. This is one instance—rare, I suppose—where second thoughts may be otiose.

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