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The TRUE Test of Linkage*

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Abstract: There are many radically different ways of understanding the distinction between linked and convergent arguments. This paper provides a generic model which enables one to articulate in a rigorous manner the important differences as well as the underlying similarities that exist between competing proposals. In addition, the paper offers a TRUE (*T*ype *R*eduction *U*pon *E*limination) test for distinguishing linked from convergent arguments which best captures the informal intuition that linked arguments are especially vulnerable to local criticisms pertaining to premise acceptability.

Numerous introductory informal logic texts distinguish linked from convergent arguments within their discussions of argument structure. Yet few meta-theoretical studies exist comparing these various accounts, and it is not widely appreciated that many of them differ fundamentally in their general characterization of the linked/convergent distinction, and accordingly in their classification of particular (types of) arguments as well. Not surprisingly, a vast array of potentially conflicting intuitions underlie these competing accounts – intuitions about exactly what the difference between linked and convergent arguments amounts to, why that particular difference is worth paying attention to, and how highlighting talk of linked and convergent arguments fits into the overall program of argument analysis and evaluation.

Few of these intuitions are entirely without merit. Therefore I doubt that there ever will (or should) be anything like a definitive, orthodox treatment of the linked/convergent distinction. The topic of argument structure is simply too rich and complex for that. Depending upon one's intentions, there are many legitimate ways of carving up the pie when it comes to classifying arguments into structural types. But choices have to be made (more or less self-consciously) in carrying out this enterprise, and those choices ought to be articulated and justified. Unfortunately, this is not always done. Introductory textbook accounts of this material are frequently written as if there is some objective, transparently obvious, single, simple distinction out there between linked and convergent arguments, which we all recognize as *given* and about which we all have (or should have) firm and consistent intuitions. From both a theoretical and a pedagogical perspective, this is a serious misrepresentation of the facts.

The only sensible way to construct any particular account of the linked/convergent distinction, and to appraise its adequacy, is by reference to the specific goals which that account is designed to fulfil. Only once those goals are specified can one ask whether the account achieves them, and whether those goals are in fact worth pursuing.

In this paper I introduce a novel way of marking the linked/convergent distinction. I claim that this proposal is adequate and worthy of consideration only in the limited sense that it formally captures, better than any other existing account, *one* set of dominant intuitions motivating talk of the linked/convergent distinction. I focus on these intuitions because of their importance and direct relevance to the practice of argumentation conceived as an interpersonal process of rational persuasion. In the interests of simplicity I concentrate on the phenomenon of linkage in most of what follows.

I

Premises, by definition, purport to offer logical support for a conclusion. Premises in a linked argument, by virtually all accounts, provide logical support in an especially communal, intimate, cohesive manner. It is often said of such premises that they work "interdependently" or "conjointly" or "cooperatively" or "in coordination with" or "through the mediation of" one another to provide conclusions with logical support. These vague metaphors can be fleshed out in any number of ways, but common to many such accounts, I think, is the pivotal intuition that linked arguments are particularly *vulnerable* to certain localized criticisms. Because premises in a linked argument work so closely together, a problem rendering any one premise unacceptable would *radically undermine* support for the argument's conclusion. The support offered a conclusion in a linked argument is so tightly interconnected that a local flaw with any one premise spreads throughout, or infects the argument as a whole. Linked arguments therefore lack immunity from local flaws.[1] To adopt yet another metaphor, a linked argument is only as strong as its weakest link. If the chain or network of premises snaps at any one location, support for the argument's conclusion is drastically diminished, and may collapse altogether.[2]

Convergent arguments, by contrast, are arguments wherein the premises work (more) independently to support the conclusion. In particular, convergent arguments are capable of withstanding local assaults directed against the acceptability of their premises. Convergent arguments lack weak links in the sense that demonstrating the unacceptability of a particular premise does not radically undermine support for the argument's conclusion (although it may weaken it).[3]

All of this, of course, is of direct relevance to the program of argument evaluation. If one is disinclined to accept the conclusion of an argument, then linked arguments in principle afford the opportunity for quick, decisive rebuttals. Find the weak link in the argument and scrutinize it carefully with respect to its acceptability. If it is deemed unacceptable, the work of evaluation is over. The argument fails to make its case. With convergent arguments, on the other hand, this process has to be repeated (at least once) with different premises. Accordingly, the odds of successful refutation are diminished.

II

How can we best formally capture this intuitive notion of vulnerability? Many existing tests of linkage and convergence share the following generic form.[4] Consider any argument A with n premises ($n \geq 2$) and a single conclusion C. Call "P_n" A's premise set, i.e. the set consisting of all and only A's premises. Two steps are typically involved in testing A for linkage or convergence. First, define what I call a *tinkering function* f which maps P_n onto some set Q of modified premise sets. (The limiting case is where f maps P_n onto P_n.) The tinkering function is the formal analogue to the informal practice of discovering (or hypothesizing about) various possible flaws with an argument's premises. Second, ascertain whether some or all members of Q bear a certain relation R to C. A *strong* test for linkage states that A is linked if *each* $q \in Q$ bears R to C. A *weak* test for linkage states that A is linked if *at least one* $q \in Q$ bears R to C. A strong (weak) test for convergence states that A is convergent if each (at least one) $q \in Q$ fails to bear R to C. While it is usually assumed that the linked/convergent distinction is exclusive and exhaustive of all arguments with two or more premises, nothing in the generic model itself precludes the violation of either of these assumptions, if that should prove to be desirable.[5]

Obviously, no introductory informal logic text discusses the linked/ convergent distinction in such abstract terms. Still, this generic model is a useful device for highlighting and articulating in a rigorous manner the many differences that exist between various concrete proposals.

One extremely popular account of linkage runs as follows.[6] Let R be the relation of *irrelevance*, and let f map P_n onto the set Q of n unit sets, each of which contains a unique member of P_n.[7] I call this an *isolation-relevance* test since it involves asking whether A's premises in isolation are relevant to C. On a weak isolation-relevance test, A is linked if at least one premise is irrelevant to C on its own. On a strong test, A is linked if each premise is irrelevant to C on its own.[8]

Isolation-relevance tests are not well-suited to capture the intuitive notion of vulnerability discussed earlier. First, a weak test yields the awkward result that any argument with a single irrelevant, superfluous premise is linked. But these arguments may not contain a weak link since they may still adequately support their conclusions once this irrelevant premise is identified and rejected. So a weak test yields too liberal an account of linkage.

Second, neither a strong nor a weak test satisfies what I have elsewhere called the validity requirement – the widely accepted requirement that (virtually) all deductively valid arguments are linked.[9] Many deductively valid arguments contain *no* premises which are independently irrelevant to the argument's conclusion. So on an isolation-relevance test these arguments are not linked. But virtually all deductively valid arguments *do* appear to be vulnerable in the sense of containing a weak link.[10] That appears to be an interesting, unavoidable liability associated with presenting an argument which supports its conclusion in the strongest way possible. So the validity requirement has some plausibility.

Finally, if we say that an argument is an instance of the fallacy of irrelevance if its premises are neither separately nor collectively relevant to its conclusion, then isolation-relevance tests yield the further anomalous result that all fallacies of irrelevance are linked. Yet, at face value, many appear not to be.[11]

Is there any way around these difficulties? A related, but more complex *negation-relevance* test runs as follows. Let R continue to be the relation of irrelevance, and let f map P_n onto a set of ordered pairs – in each case, the first member of which is a single premise, the second member of which is a set containing the negation of each remaining premise in P_n.[12] On a strong (weak) negation-relevance test, an argument is linked if each (at least one) premise is irrelevant to the argument's conclusion, on the supposition that the remaining premises are false.[13]

Unfortunately, this test barely represents an advance over the simpler and more elegant isolation-relevance tests. Negation-relevance tests also (i) fail to satisfy the validity requirement and, in all but very exceptional cases, (ii) automatically classify fallacies of irrelevance as linked, and (iii) automatically classify arguments with a single irrelevant premise as linked.[14] The qualification pertaining to cases (ii) and (iii) above results from the fact that a premise which is irrelevant on its own to a conclusion may become relevant on the supposition that some other (independently) irrelevant premise is false. However, it is not obvious that arguments which exhibit this peculiar feature should be classified as convergent.[15] Therefore, the fact that negation tests generate a marginally less liberal account of linkage does not necessarily speak in favor of those tests, and does not substantially alter the fact that they suffer from the three basic flaws which afflict isolation-relevance tests as well.

Perhaps a solution may be found by abandoning the notion of relevance and focusing instead on the comparative degrees of logical support which various combinations of premises offer the argument's conclusion. For *isolation-relativity* tests of this sort, define a new function Supp(P_n,C) which specifies (presumably on at least some rough ordinal scale) how much logical support a set of premises P_n offers a conclusion C. Now, the test for linkage runs as follows. As in isolation tests generally, f maps the original premise set P_n onto the set Q of n unit sets, each of which contains a unique member of P_n. The relation R, however, is no longer irrelevance but a more complex relation defined in terms of Supp. Specifically, some member $\{P_i\}$ of Q bears R to C if Supp (P_n,C) is *much greater than* Supp ($\{P_i\}$,C). Intuitively, then, A is linked on a weak (strong) test if P_n offers much greater logical support for the conclusion than does some (each) single premise on its own.[16]

Isolation-relativity tests are an improvement over relevance tests principally because, as I shall explain later, they satisfy the validity requirement as well as can be expected. However, in other important respects they fail miserably to capture our intuitive notion of vulnerability. First, weak relativity tests classify as linked all arguments which provide some support for their conclusions and yet contain a single irrelevant premise. This again appears to be too liberal an account.

Second, relativity tests yield the quite surprising contrary result that *no* arguments which are instances of the fallacy of irrelevance are linked. Given current orthodox assumptions, this entails that all fallacies of irrelevance are convergent.[17] Again, however, many appear not to be.[18]

Finally, and perhaps most seriously, both strong and weak isolation-relativity tests classify certain non-fallacious arguments (without any irrelevant premises) as linked when they do not contain a weak link. That is, support for the conclusions of these arguments is not radically undermined if any single premise is rendered unacceptable. Two cases are worth mentioning. (A) The inductive generalization (twenty-six premise) argument "Queen Anne is rich, Queen Beatrix is rich, ..., Queen Zenobia is rich; therefore all queens are rich" does not contain a weak link.[19] However, it is classified as linked on an isolation-relativity test (since the claim that one queen is rich provides much less support for the conclusion than does the original premise set). Many generalization arguments obviously share these two features.

(B) Conductive arguments which offer separately relevant, non-sufficient, non-empirically based reasons in support of a conclusion are also not vulnerable in the relevant sense.[20] Yet, on even the most charitable reading of the vague relation "much greater than," many such arguments are linked on an isolation-relativity test. Here is one example. "This car is cheaper than its competitors. It has the best ride. It has the best warranty. It is the safest car on the market. Therefore, you ought to buy this car."

III

Although many accounts of the linked/convergent distinction are not stated with sufficient clarity or generality so as to enable a reader to ascertain exactly how a test for linkage is meant to apply to any argument whatsoever, I am willing to hazard the guess that most existing accounts of linkage are based on isolation tests. However, if a linked argument is an argument which contains a weak link, the unacceptability of which would radically undermine support for the argument's conclusion, then isolation tests may be fundamentally misguided in examining premises in isolation, entirely divorced from the rest of the argument within which they occur. This procedure seems too far removed from the actual practice of argument criticism and evaluation, where typically individual premises are scrutinized within the context of the entire remainder of the premise set. A linked argument, I said earlier, is an argument which cannot survive a successful local assault. That isolation tests do not well mirror actual practice may explain why they generate so many anomalous results.[21]

My own view is that relativity tests can be salvaged by first moving away from isolation tests to what I call *elimination* tests, and then refining in a fairly obvious way the relation Supp of logical support. I will begin with the second task. At a very crude level it is possible to distinguish three distinct *types* of logical support which a set of premises may provide a conclusion. Either (i) the truth of the premises provides conclusive support for the truth of the conclusion (in which case the conjunction of the premises with the negation of the conclusion is inconsistent), or (ii) the truth of the premises provides some degree of non-conclusive support for the truth of the conclusion, or (iii) the truth of the premises provides no support whatsoever for the truth of the conclusion. These alternatives are mutually exclusive and exhaustive, though of course (ii) in particular admits of many further possible refinements.[22] In case (i) I say that P_n provides *maximal* support for C, in case (ii) that P_n provides *intermediate* support for C, and in case (iii) that P_n provides *null* support for C. In general, a premise set provides *positive* support for a conclusion if it provides either maximal or intermediate support for that conclusion.

Now, define a relation < obtaining amongst degrees of logical support such that Supp(P,C) < Supp(P',C') if, and only if, the *type* of logical support which P provides C is *weaker than* the *type* of logical support which P' offers C'. Next, for any premise set P_n, a *zapped* premise set can be created by eliminating exactly one premise from P_n. Where n ⊕ 2, corresponding to each P_n, there exists a set Q of n distinct non-empty zapped premise sets, each member of which contains exactly n - 1 members. So define a *zapping* (tinkering) function f which maps P_n onto its associated set Q of zapped premise sets.[23]

Finally, an argument A is linked on my *elimination-relativity* account if, and only if, each of the following three conditions obtain.

(1) P_n contains at least two members.
(2) P_n provides positive support for C.
(3) There is at least one zapped premise set $q \in Q$ such that Supp(q,C) < Supp(P_n,C).

An argument is convergent if, and only if, clauses (1) and (2) obtain, and (3) does not.

This TRUE (or *T*ype *R*eduction *U*pon *E*limination) test is naturally a weak test since it is designed to spot weak links. Intuitively, it says that an argument is linked if the type of (positive) support which its premises offer its conclusion would be weakened upon elimination of at least one of its premises. Premise sets which initially offer maximal support are weakened by offering either intermediate or null support.[24] Premise sets which initially offer intermediate support are weakened by offering null support.[25]

In virtue of clause (2), premise sets which initially offer null support cannot occur within linked or convergent arguments. Therefore the TRUE test violates the orthodox assumption that all arguments with two or more premises are either linked or convergent (without violating the other orthodoxy that no argument is both linked and convergent). In particular, all fallacies of irrelevance are neither linked nor convergent. This makes a good deal of sense, I think, since talk of linked and convergent arguments was originally introduced to mark a distinction between different types of structures of logical support. But if a premise set provides *no* support for a conclusion, how can it structurally exhibit a particular *type* of support? More importantly, fallacies of irrelevance lack weak links in the sense that it is not the case that removing a single premise would radically undermine support for the argument's conclusion. So these arguments are not appropriately vulnerable and thus not linked. But it would be extremely misleading to therefore classify them as convergent. Such a strategy would obscure the significant difference between these fallacious arguments and arguments which lack weak links in a positive and more interesting sense.[26]

It is important to realize, however, that clause (2) of TRUE does not define poor, or logically defective linked (or convergent) arguments out of existence. Clause (2) defines a minimal threshold of logical support which a linked (or convergent) argument must possess. But many arguments which pass this threshold may still fail to provide sufficient evidence for their conclusions. Not all linked (or convergent) arguments are good arguments, in the sense that it may not be rational to accept the conclusions of many of them, on the basis of the evidence cited.[27]

TRUE also satisfies the validity requirement, as well as can be expected. With only two exceptions, every deductively valid argument contains a premise set such that the removal of at least one premise from that set reduces its support for the conclusion from maximal to either intermediate or null support. Those exceptions are (i) valid arguments with necessarily true conclusions, and (ii) valid arguments whose premise sets can be divided into disjoint proper subsets each of which validly entails the argument's conclusion.[28] Interestingly enough, for neither of these two exceptional cases is it fair to say that these arguments contain a (single) weak link. TRUE therefore captures exactly the appropriate notion of vulnerability associated with deductively valid arguments.

The TRUE account of type reduction provides a precise, formal analogue to the earlier intuitive notion of support for a conclusion being "radically undermined" by the unacceptability of a single premise. Notice that TRUE allows for the possibility that some zapped premise set of a linked (deductively valid) argument may still provide (substantial) intermediate support for the argument's conclusion. (This is one consequence of wanting to preserve the validity requirement since not all zapped premise sets of deductively valid arguments offer null support.) In these cases, support for the conclusion is radically undermined just in the sense that it suffers a quantum jump from maximal to intermediate support. While support for the conclusion may not collapse altogether, this drop in type of support calls for a shift in the sorts of evaluative questions that ought to be directed at the argument, and may justifiably cause certain arguers in certain contexts to lose interest in the argument or at the very least to refuse to believe the argument's conclusion.

Notice further that, unlike each of the (weak) tests discussed earlier, TRUE does not automatically classify arguments with a single irrelevant premise as linked. Of course, some arguments (including deductively valid arguments) with irrelevant premises will be linked on TRUE.[29] Two noteworthy cases are (A) two premise arguments with a single irrelevant premise where the remaining premise by itself provides either maximal or intermediate support for the conclusion, and (B) n premise arguments with a single irrelevant premise where each of the remaining n - 1 premises are needed to provide either maximal or intermediate support for the conclusion. ((A) is actually just a special case of (B)). Again, however, each of these arguments contains a weak link, the presence of which has nothing to do with the irrelevant premise.

In fact, due to monotonicity, valid arguments with *many* irrelevant premises will often be linked on TRUE. Any valid argument with a weak link will remain valid (and linked) no matter how many irrelevant premises are added to the argument. This is an interesting result since it shows that, contrary to popular opinion, the validity requirement is not trivially falsified by valid arguments of this sort.[30]

The reader may verify that the TRUE test confirms a number of further widespread intuitions about the linked/convergent distinction, and that these intuitions reflect the informal conception of linked arguments as containing weak links. For example, according to TRUE, all analogical arguments (in standard form) are linked, as are all arguments positively corroborating (scientific) hypotheses which take the form of affirming the consequent.[31] On the other hand, TRUE classifies all conductive arguments and inductive generalizations as convergent.[32]

IV

It may appear, however, that the TRUE test deviates significantly from standard practice in one very important respect. Virtually every textbook discussion of the linked/convergent distinction is couched within a general account of argument diagramming and it appears to be widely assumed that argument diagrams are to be constructed as an aid (and therefore prior) to any work of evaluation. Classifying arguments as either linked or convergent is therefore generally taken to be a purely descriptive exercise – an exercise, presumably, in displaying the structure of an argument as it is conceived by its author.[33]

TRUE clearly departs from this (perceived) standard practice since it requires appraising the *actual* degree of logical support provided for conclusions by original and zapped premise sets. An objection that therefore might be raised against TRUE is that there is little point invoking a distinction between linked and convergent arguments as an aid to argument evaluation if the distinction can be drawn only *after* engaging in that very process of evaluation.[34]

There are at least two replies to this objection. First, if the objection is sound, it applies to every other test discussed in this paper and not just to TRUE. Relevance tests rely upon making objective judgments of relevance, and relativity tests operate by making objective judgments about comparative degrees of logical support. This suggests, I think, that the pervasively held assumption that most existing accounts of the linked/convergent distinction operate purely at the descriptive level is simply incorrect.[35]

Second, and more importantly, the objection is not sound. There are many stages to argument evaluation – appraising an argument is not something that can take place in one movement, with one fell swoop. Therefore, the fact that some distinction is drawn by employing evaluative concepts and adopting an evaluative point of view does not preclude that distinction from serving a useful purpose at later stages in the evaluative enterprise.

Applying the TRUE test presupposes some conceptual sophistication in the art of argument evaluation.[36] But the process of evaluation is not over once the test has been applied and, most importantly, the specific *direction* of further evaluative work may shift depending upon the outcome of the application of TRUE. For example, if the argument is linked, it becomes appropriate to concentrate immediately upon the question of the acceptability of a particular premise – possibly paving the way for a quick, decisive rebuttal, and bypassing the need to formulate difficult, fine-grained judgments as to whether the premises provide enough logical support so as to make it reasonable to believe the conclusion. Not so, if the argument is convergent. And if it is discovered that the argument is neither linked nor convergent (because the premises offer null support), the entire evaluative process should probably be halted immediately in favor of returning to the purely descriptive question of what could the author possibly have had in mind in claiming that *this* was a reason for *that*.

Notes

* Some of the following results were presented at the 1991 Canadian Philosophical Association meeting in Kingston, Ontario (I thank Chris Tindale for helpful comments on that occasion) and the 1991 McMaster Summer Institute on Argumentation. Two anonymous *Informal Logic* referees also provided constructive criticisms.

1 A particularly clear statement of the intuition that linked arguments are vulnerable in this sense can be found in Trudy Govier, *A Practical Study of Argument* (Belmont, CA: Wadsworth Publishing Company, 1988) 139.

2 The discipline of informal logic currently lacks a comprehensive, paradigmatic theoretical account of premise acceptability. The informal notion of argument vulnerability, however, presupposes at least some intuitive account. For the purposes of this paper, I will say that an argumentative premise is *unacceptable* within a certain context if it cannot legitimately serve as evidence for the argument's conclusion within that context (although it is offered as evidence). Within the actual practice of argumentation, the unacceptability of a premise can be established in countless ways. But in each case the net effect of demonstrating unacceptability is that the premise must be blocked from consideration – as proffered evidence, it is rendered inadmissible in establishing the conclusion at hand.

3 See Stephen N. Thomas, *Practical Reasoning in Natural Language* (Englewood Cliffs, NJ: Prentice-Hall, 1986) 61.

4 Those which do not tend to be extremely vague and of considerably less practical value or theoretical interest. Robert J. Yanal, for example, at one point in *Basic Logic* suggests that premises in a linked argument "fill in each other's logical gaps" and "are in the same line of thought" (St. Paul, MN: West Publishing Company, 1988) 43.

5 Exclusivity means that no particular set of premises is both linked and convergent with respect to a particular conclusion. But of course a single conclusion may receive both linked and convergent support from distinct sets of premises within a single argument.

6 See, for example, James B. Freeman, *Thinking Logically* (Englewood Cliffs, NJ: Prentice-Hall, 1988) 174-179; David Kelley, *The Art of Reasoning* (New York: W.W. Norton, 1988) 86-87; Lilly-Marlene Russow and Martin Curd, *Principles of Reasoning* (New York: St. Martin's Press, 1989) 17; Kathleen Dean Moore, *Reason and Writing* (New York: Macmillan Publishing Company, 1993) 40.

7 That is, $f(P_n) = \{ \{P_1\}, \{P_2\}, \ldots, \{P_n\} \} = Q$.

8 Strictly speaking, there are many strong and weak isolation-relevance tests since different tests may employ quite different positive accounts of the relevance relation, which may in turn affect their classification of particular arguments. A similar comment, of course, applies to the various tests I discuss later which utilize other theoretical concepts besides relevance.

9 "Linked Arguments and the Validity Requirement," *Argumentation* 9 (1995) 291-304.

10 I elaborate upon this point later.

11 "Betty is beautiful. Betty is from Budapest. Therefore, we should hire Betty to type the manuscript." In this argument the premises appear to function independently of one another.

12 In the simplest case, where $n = 2$, $f(P_n) = \{ \langle P_1, \{\sim P_2\} \rangle, \langle P_2, \{\sim P_1\} \rangle \} = Q$.

13 Govier, for example, instructs the reader to " ... imagine all premises except one in this group to be false and ... ask whether the remaining premise would still give any support to the conclusion in this case" (1988) 143. In order to make this test conform to the generic model presented above, it is necessary to stretch linguistic conventions somewhat to say that an *ordered pair* $\langle P_i, \{\sim P_j\} \rangle$ bears R to C if P_i is irrelevant to C, on the assumption that P_j is false.

14 The last charge holds only with respect to weak tests. Again, for results pertaining to the validity requirement, see my paper cited earlier in note nine.

15 Consider the following argument presented by someone who (not unreasonably) believes that the word "some" in natural language normally carries the connotation of "only a few," or at

least "not many". "Finney is a fish. Some fish are ferocious. Therefore, Finney is probably not ferocious." Within standard quantificational logic, of course, neither premise in isolation provides any support whatsoever for the conclusion. However, given the orthodox reading of the existential quantifier as meaning "at least one," the first premise entails (and is therefore relevant to) the conclusion, on the supposition that the second premise is false. Nonetheless, the argument is intuitively linked.

16 See Yanal (1988) 42-45. Thomas employs this criterion as part of a larger test in (1986) 59.

17 Yanal himself writes that "Two (or more) reasons are independent [convergent] when they are not dependent [linked]" (1988) 53.

18 "If Betty is from Budapest then she is brazen. If she is brazen then she is beautiful. If she is beautiful then we should hire her to type the manuscript. Therefore, if we should hire her to type the manuscript, she must be from Budapest." In this argument the premises appear to function interdependently. Yet the argument is not linked on an isolation-relativity test because the premises collectively offer no support for the conclusion, and therefore they do not offer greater support than any individual premise.

19 This is because the unacceptability of a single premise merely reduces the evidence for the conclusion from twenty-six to twenty-five bits of information, which does not (at least in this context) radically undermine support for the conclusion.

20 See Govier (1988) 247-248 for an account of conductive arguments as convergent. See also Govier, *Problems in Argument Analysis and Evaluation* (Dordrecht: Foris Publications, 1987) 65-70 for a more thorough and theoretical discussion of conductive arguments.

21 Negation tests too generate a highly artificial notion of linkage and vulnerability since they operate on the restricted assumption that a certain premise is false. However, establishing that a premise is false is only one, and indeed one of the epistemologically more demanding ways of establishing that it is unacceptable. That is, one cannot infer that a premise is false because it is unacceptable. (It may, for example, just be highly controversial.) Negation tests therefore focus on one special case of the general and varied practice of establishing premise unacceptability. Furthermore, given their exclusive concern with the operation of logical negation, the application of negation tests can raise distinctive philosophical and pedagogical problems. Consider again the generalization argument concerning rich queens. If the negation of, say, "Queen Beatrix is rich" entails that some queen is not rich, then arguably no other premise is relevant to (i.e. provides any support for) the conclusion "All queens are rich" (on the assumption that "Queen Beatrix is rich" is false), and therefore the argument is linked. But if we cannot infer the existence of a non-rich queen from the negation of "Queen Beatrix is rich," then the generalization argument is convergent on this test. Isolation (and the soon to be discussed elimination) tests are simply easier to apply (and teach) since they require only that certain claims be blocked from consideration.

22 If one were to give (at least in certain contexts) a probabilistic rendering to the notion of support, then it could be said that a set of premises provides non-conclusive support for a conclusion C just in case the truth of those premises would increase the antecedent probability (without guaranteeing) that C is true. But the amount by which that probability increases could range from being slight, to moderate, to extremely large.

23 The zapping function is indiscernible from the tinkering function of an isolation test only in the simplest case where n = 2. But, for example, where n = 3, $f(P_n) = \{ \{P_1, P_2\}, \{P_1, P_3\}, \{P_2, P_3\} \} = Q$.

24 In this special case, arguments linked on TRUE correspond roughly to what Bolzano called "exact" or "adequate" arguments – valid arguments which are rendered invalid by the removal of a single premise.

25 TRUE could therefore easily be modified to generate a more liberal account of linkage by introducing finer distinctions between different types of logical support, thereby increasing the frequency with which the elimination of a premise results in a weaker type of support.

26 Of course, fallacies of irrelevance may still *appear* to be linked or convergent, particularly to the authors of those arguments, when entertained against various background beliefs. The arguments offered in notes eleven

and eighteen ought to be read in light of this comment.

27 "52% of the males working at the blood donor clinic are heroin addicts. My son works at the clinic. Therefore, my son is a heroin addict." The premises of this linked argument provide intermediate support for, but arguably do not justify belief in the conclusion.

28 The reader may verify that weak isolation-relativity tests also satisfy the validity requirement to this extent.

29 This result may admittedly appear anomalous to those philosophers who prefer to speak of linked *support* rather than, as I do, of linked *arguments*. Irrelevant premises do not support their conclusions at all and so cannot participate, along with other premises, in any of those networks of support which argument diagrams are typically meant to perspicuously display. The TRUE test, however, treats linkage as a property of arguments as a whole, which may or may not be affected by the presence of irrelevant premises. Therefore, to say on TRUE that an argument is linked is *not* to say that each premise of the argument necessarily *contributes* to the positive support offered the conclusion.

30 An anonymous referee once wrote to me that "because of the monotonic property of deductive logic . . . the validity requirement only appears to be a general principle that is of interest to informal logic. In fact, it is a platitude that turns out to be false."

31 In standard form, the first premise of an analogical argument states that m individuals share n properties. The second premise states that all but one of those m individuals share some further property P. The conclusion states that the individual omitted from the second premise also possesses P. Non-fallacious analogical arguments provide intermediate support for their conclusions, and these arguments are linked in standard form on TRUE since some (in fact, each) zapped premise set provides null support for the conclusion. However, the information in the premises of an analogical argument can be "packaged" in such a way that TRUE may classify the argument as convergent. For example, simply refer to the properties of the m individuals in m distinct premises. The TRUE test, like all other tests with which I am familiar, cannot divorce the structural classification of arguments from some (preferred) procedure for individuating the premises of those arguments. This of course becomes less of an issue when we consider premise sets with very little content. Many powerful analogical arguments, for example, employ only three bits of information in the premise set – citing one property shared by two individuals, and a further property possessed by one of those individuals (which is extrapolated to the other individual in the conclusion). However this information is packaged, TRUE classifies this sort of argument as linked.

32 Uncontested intuitions, however, are pretty hard to come by and it would be silly to deny that the TRUE test generates certain results which seriously clash with a number of fairly popular, well-motivated and not unreasonable convictions. One dominant opposing intuition motivating talk of linkage and convergence is the idea, variously expressed, that in a linked argument all the premises must be considered together if we are to recognize a persuasive case for accepting the conclusion; or if we are to be presented with the total body of evidence intended to justify belief in the conclusion; or if we are to appreciate "the strongest case possible" for the conclusion which can be derived from the set of premises. Something like this, I believe, underlies John Eric Nolt's account of the linked/convergent distinction in chapter two of *Informal Logic: Possible Worlds and Imagination* (New York: McGraw-Hill Publishing Company, 1984) from which the preceding quotation is drawn (32). Similar notions seem to underlie Thomas's (1986, p. 61) and Yanal's (1988, p. 43) claims to the effect that convergent arguments are equivalent to, and ought to be treated as more than one single argument. And related intuitions have likely led authors in a recent issue of this journal to assert, contrary to TRUE, that all inductive generalizations are linked (Robert Yanal, "Dependent and Independent Reasons," *Informal Logic* 13 (1991) 141); and to offer, again contrary to TRUE, the following argument as "intuitively linked": "Nadine lays eggs. Nadine suckles her young. So Nadine is a platypus" (David A. Conway, "On the Distinction between Convergent and Linked Arguments," *Informal Logic* 13 (1991) 148). Reasoning along these lines would presumably also lead one to classify my earlier conductive argument about buying a car as linked.

Not all of these motivating intuitions are precisely the same, of course, and important work needs to be done disentangling them. Perhaps some of these intuitions could be accommodated within the spirit of TRUE, by modifications of the sort outlined in note 25. But certainly some of them could not in so far as they invoke epistemological notions which cannot neatly be mapped onto the ordering scheme of degrees of logical support employed by TRUE. Sometimes, for example, maximal support is needed to establish a persuasive case, or to warrant rational belief. In other cases, intermediate support (of varying degrees) is sufficient.

I suspect therefore that these are, for the most part, intuitions to which TRUE cannot do full justice. They may also, however, be intuitions of questionable value in so far as they tend to generate accounts of the linked/convergent distinction which seriously run the risk of undermining the significance of that very distinction. On Nolt's analysis, for example, convergent arguments occur only in overkill situations where, roughly, each separate premise provides (or is at least supposed to provide) such strong evidence for the conclusion that it single-handedly "implies," provides "good evidence for," or justifies belief in the conclusion. (See his ice cream example on (31).) While this nicely explains why one would think of convergent arguments as being literally more than one argument, it is at the same time disconcerting to note that epistemically privileged situations of this sort are, in Nolt's words, "relatively rare" (32). In fact, this claim is a bit of an understatement. Fewer than eight percent of the argument diagrams which appear within Nolt's text, for example, are convergent. A generic distinction which aims to divide virtually all arguments into two exclusive classes but which so rarely applies in practice is arguably a distinction of only minor significance – especially since that distinction can apparently be captured just as well, or even better perhaps simply in terms of talk of argument individuation.

[33] Of course, not everyone believes that a purely descriptive account of argumentation is even possible, much less desirable. On some views, argument diagramming, like every other stage of argument reconstruction and analysis, is an essentially evaluative, normative, or interpretive enterprise. For one set of considerations on the importance of providing a descriptive representation of arguments as they are conceived by their authors, see my paper "Defining Deduction," *Informal Logic* 14 (1992) 105-118.

[34] This sort of objection is hinted at by David Conway (1991) 152.

[35] Now, if it is felt that argument diagramming *must* be a purely descriptive exercise, that would be an argument for discussing the linked/convergent distinction apart from any account of diagramming – as I have done in this paper. Presumably, diagramming would be of much less utility without some form of the linked/convergent distinction. (See the following note.) But it may nonetheless be worthwhile drawing this distinction even if one looks disfavorably upon the practice of argument diagramming.

[36] Therefore, on this proposal discussions of linkage will have to occur at a later stage in textbook accounts than is currently the norm. In particular, the application of TRUE presupposes some understanding of deductive validity, inductive strength, and fallacies. The rudiments of argument diagramming could of course be introduced prior to any of these topics, if so desired. I am currently leaning towards the view that diagrams principally ought to represent relevance relations, and that the construction of diagrams ought to be modelled upon something like isolation-relevance tests. Of course, I have no objection to the use of the *terms* "linked" and "convergent" at this level of analysis. The TRUE test – construed perhaps, in order to avoid confusion, as a test of *vulnerability* rather than linkage – is compatible with, and could easily build upon and enrich this approach to diagramming.

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