THE LOGIC OF ABILITY

Douglas Walton

April, 1975
Abstract:

Work on 'can' in Action Theory is dichotomized into two styles of analysis: (1) what I call the indeterministic analysis, whereby for x to be able to do A means that there is no obstacle to x's doing A, and (2) the hypothetical analysis, which asserts that x is able to do A if and only if x will do A if x tries (wants, wills, chooses, etc.). This paper explores the general hypothesis that 'can' is two-ways ambiguous, that a sense of opportunity corresponds to (1) and a sense of ability to something after the pattern of (2), and that a general concept of 'can' of the kind often sought after by action theorists requires a certain kind of integration of both concepts into a unified definition. The two previous most well-worked-out attempts to lay out a program along these lines, those of Sellars and Chisholm, are analyzed in detail in the hope of smoothing out some of the technical differences to provide foundations for further work of this type. An attempt is made to integrate the program with some recent developments in the concept of ability in the social sciences. The applicability of this work to some very vexing and significant problems in the social sciences is suggested.
Writers on ability concepts in Action Theory tend to fall into two camps, one suggesting explication of ability as a kind of possibility, the other suggesting a hypothetical, often dispositional explication. The first group, whom we might call indeterminists or nihil obstat theorists, argue that to say 'I have the ability to do A' (sometimes the explicandum is 'can' or 'be able' or 'in my power') means that there are no circumstances that prevent my doing A.* The other group, the hypotheticalists, argue that 'I have the ability to do A' means that if I choose (or will or undertake or want) to do A then I will do A. This polarization is an abstraction—some writers combine both views, or have other views, or make further distinctions in the explicandum—but a useful abstraction for orienting us in the literature. In this paper, I discuss both views and consider various ways of combining them that might offer us a viable analysis of the family of power concepts including the concept of ability.

In order to set the stage for our discussion, let us set out the two analyses and then set down a potentially ruinous counter-example for each—then we will be oriented to trying to find ways to exploit each analysis without running afoul of the counter-example and related difficulties that arise. First let us state the indeterministic or nihil obstat analysis.

(E) x has the ability to do A (has the power to do A, can do A, is able to do A) if, and only if, it is causally possible for x to do A.¹

*An indeterminist, in this context, is an adherent of the above style of nihil obstat analysis of the concept of ability. This analysis need not imply a belief in the falsity of determinism. Thus 'indeterminism' is used here in a specialized and non-standard way.

¹Obviously the variations in the explicandum are problematic and may suggest different explicantia, but there appears to be little agreement in the literature, and readers should not be too bothered by this, initially, as these differences are discussed further on at some length. Writers who have
A counter-example can be constructed as follows. This statement of the counter-example is my own although the essential notion is originally due to Richard Taylor\textsuperscript{2} and also to Roderick Chisholm.\textsuperscript{3} Let us assume that my hand is placed in a sort of fantastic apparatus in such a way that if a red button is pushed, my finger is held absolutely immobile, whereas if a green button is pushed freedom of movement is restored. Let us further assume that I have no access to this panel of buttons, but Jones does. Then at some time \( t \), we will have a situation where it is not within my power to move my finger but where it is causally possible that I move my finger. It is not within my power because Jones can prevent it by pushing the red button, but it is causally possible since it is both causally possible that (a) Jones pushes the green button, and (b) I move my finger at \( t \).\textsuperscript{4} Now there are various ways of modifying (E) to allow for the counter-example, and we will examine some of them in what follows. First, however, the hypothetical analysis may be stated as follows.

\[(E_1) \ x \text{ has the ability to do } A \ (\text{has the power to do } A, \ \text{can do } A, \ \text{is able to do } A) \text{ if, and only if, } x \text{ chooses (wills, wants, tries, undertakes) to do } A, x \text{ will do } A.\textsuperscript{5}\]

\[\text{Writers who have held this general type of view include:}\]


\[\text{Roderick Chisholm, 'He Could Have Done Otherwise' in Brand, op. cit., p. 296.}\]


\[\text{Writers who have held this general type of view include:}\]
The possible counter-example to this analysis is jointly due to Roderick Chisholm and Keith Lehrer, and my statement of it is this: let C be any condition the proponent of \((E_1)\), wishes to specify, then we can always think of a case where I would do x if C, but I can't do x if \(\sim C\), and I can't do C and therefore I can't do x. A specific example will help. Suppose I have a pathological fear of red candy balls. Suppose further that I am so afraid of them that I cannot touch them. Furthermore, being strong-willed in sticking to my choices, it is true of me that if I were to choose to take one, I would, but barring my choice to take one I could not possibly bring myself to take one. In this example two things are simultaneously true—I can't take one, and I would take one if I chose. Thus we have constructed a counter-example to \((E_1)\). Now this type of counter-example is problematical—Aune's replies to Lehrer indicate that, by itself, it may not effectively dissuade exponents of \((E_1)\). But let us remain content here with being acquainted with it as a datum against which \((E_1)\) can be studied, and bypass the internal dialectics of the Lehrer-Aune debate.


8 This example is due to Keith Lehrer. See Keith Lehrer, 'Cans Without Ifs,' *Analysis*, Vol. 27, No. 6, 1968.

Hume explicitly recognized both the indeterministic and hypothetical types of explicantia for the concept of liberty. In the Treatise, Hume distinguished between the liberty of indifference and the liberty of spontaneity. The first is opposed to necessity or causation, and the second is opposed to 'violence.' Hume argued that spontaneity is the most common sense of the word 'liberty' and that it is this sense that we ought to be concerned to preserve. On the ground that necessity (analyzed Humeanly as constant conjunction) applies to human actions, Hume argued that the liberty of indifference does not really exist in actuality, even though we must recognize it is a concept in order to unravel the verbal confusions in the language of the freedom-determinism debate.10 Thus in the Inquiry, Hume defines liberty as the power of acting or not acting according to the determinations of the will. That is, if we choose to remain at rest, we may; if we choose to move, we also may. Interestingly, he noted that this kind of liberty is hypothetical. He also observed that this kind of liberty is universally allowed to belong to everyone who is "not a prisoner and in chains."11 Hume is well known for his remarkable ability to set out clearly issues that have since become crucial philosophical controversies, and this issue is no exception. Current analyses of power concepts have as the fulcrum of controversy the indeterministic-hypothetical dichotomy, and this is the very same distinction that Hume drew as indifference-spontaneity.

The Lehrer-Aune controversy is based on the assumption that the analysans of the hypothetical analysis expresses a counterfactual conditional. But now the question arises: What if we assume that the analysans is not a counterfactual conditional at all? The answer seems to be that the hypothetical analysis is vindicated, since it would now be impervious to the Lehrer counter-example.

Now there are two obvious ways to set up a hypothetical analysis that is open to interpretation as noncounterfactual.

(E2) \( S \text{ can do } x = df \) \( S \text{ will do } x \) (every time) if he tries (wants to, chooses, wills, etc.)

(E3) \( S \text{ can do } x = df \) \( S \text{ will usually do } x \) if he tries (wants to, chooses, wills, etc.)

---


'He can,' then, implies 'he usually succeeds if he tries;' and equally, though one success might be a fluke, 'he usually succeeds, if he tries' implies 'he can.' . . . Statements of ability are statements to the effect that someone is usually or would usually be successful in a series of attempts. . . . (96f.)

Nowell-Smith's version, (E3), is his attempt to rebut Austin's golfer counter-example in "Ifs and Cans." It is fairly obvious, I think, that (E2) is indefensible. Consider Austin's case where I could sink the putt even though I tried once and missed. But (E3) is more plausible. If I usually miss that kind of putt, I hardly seem justified in saying that I can sink it.

But it is easily seen that the plausibility of (E3) is only superficial. Supposing I usually sink that kind of putt, but that today I have a broken arm. In this case, despite the truth of the proposition that I usually sink them, I may not be justified in saying that I can sink this one. It may be perfectly apparent that I can't. The hypotheticalist will reply that this is not a fair example, since one of the circumstances of the case is different. The reply is that this just proves that usually doing x is not a sufficient condition, by itself, of being able to do x. Some additional factor taking into account changes of circumstance in different cases must be inserted into the right side of (E3). Furthermore, it is by no means apparent just how this is to be done. Exactly how similar must the circumstances be? It is reasonable to expect that this will prove a difficult question to answer.

The hypotheticalist argument here is something like the argument that induction is simply enumeration. The reply is that simple enumeration is not a sufficient condition of an inductively correct argument, since other factors must be taken into account, such as whether the cases enumerated constitute an adequate sample of the class that is being projected onto. Similarly, it is a fact about the verification of can-statements that simple enumeration of instances is not sufficient. The instances must be sufficiently like the case in question to justify the assertion of the can-statement.

Also, consider the case where I don't try to do x at all. In this case, if one takes the right side of (E3) as a material implication, the right side of (E3) is true. Hence the left
side would be true. In other words, according to \( (E_3) \), if I don't try to do something at all, it follows that I can do it. Surely this is an absurd consequence. Now Nowell-Smith can reply that the IF isn't that kind of IF. But then the question is "Just what kind of IF is it?" If it is a counterfactual IF then \( (E_3) \) collapses back into the Lehrer-Aune type of analysis that we have already dealt with. If it is neither of these types of IF, then it calls for a good deal of additional clarification, to put it mildly, if it is to function as part of an analysans for CAN.

On the other hand, what if we take the opposite tack and declare that in the case where I don't try at all, the proposition that I usually succeed if I try is false (not true, as in the alternative above), on the ground that the number of instances of its occurrence has failed to reach a certain level. The hypothetical analysis purports to claim that my usually succeeding if I try is a necessary condition of my being able to do something. So perhaps the hypotheticalist wants to say that, where I don't try at all, it's not true to say that I usually succeed if I try. Hence, in this case it follows that I can't do the thing in question. But this consequence is equally unpalatable. Just because I have never actually tried to lift this pencil in front of me, it does not follow that I can't lift it. Surely it is not a necessary condition of my being able to do something that I have actually tried doing it. I may never have tried it, yet be perfectly justified in asserting my ability to do it. Perhaps all that is shown is that the conditional is not meant to be applied to individual cases. But how are such cases to be analyzed?

These considerations lead me to think that the non-counterfactual version of the hypothetical analysis is even less hopeful than the counterfactual version. Certainly \( (E_3) \) as it stands faces very serious objections. A more recent version of \( (E_3) \), while perhaps tenable as an equivalence, suffers the same difficulties as an analysis of ability:12

\[ (E_4) \quad A \text{ has the ability to} = \text{df} \quad A \text{ is in a certain condition, } C \text{ (C being the appropriate state of the organism brought to a certain pitch of development), such that, given opportunity, } C \text{ causes } A \text{ to succeed in } x' \text{ing an appropriate percentage of the time (where the appropriate percentage is determined by the unspecified complexity of } C), \text{ if he should try to } x. \]

---

12 Arnold S. Kaufman, 'Ability,' in Brand, op. cit., pp.192-203. \( (E_4) \) occurs on p. 199.
The most serious problem here, as with (E₃), is the characterization of C. It is simply not clear that there is any state C that corresponds to an ability, and the idea that we might measure the complexity of C seems simply absurd. The usefulness of (E₄) as providing a reduction schema for abilities may be vindicated by empirical research (insofar as it is helpful to think of an organism as having an input, a state and an output that is a probability function of these two factors) if isolable physical states of the organism can be identified with abilities, but this remains dubious. Thus as a reduction schema for abilities, (E₄) may have some potential plausibility, but as an analysis, it is vitiated by the evident lack of criteria for C; it begs the question. We should also observe that empirical research may tend to lead us to reject C. Many abilities may not be correlatable with anything we might call "a state of the organism" in which case the model for ability along the lines of (E₄) might consist in Rylean summary dispositions, i.e., the ability of x to do A might be described as a probabilistic function of x to respond to certain stimuli without postulating any unidentified states of the organism.

Thus we might provisionally adopt (E₄) as providing a rough starting point, an initial proposal for a reduction schema for ability statements. We will find in the course of further investigations that further refinements of it are necessary. One point to note before passing on is that the conditional in the right side of (E₄) is undefined.

The inability of (E₄) to distinguish between "having an ability" and "being able" (Kaufman argues that the ability to speak a language and the "ability" to lift a pencil are both abilities) generates a minor problem. Suppose that a golfer becomes dizzy for a short interval, II, as a result of taking a slight overdose of tranquilizers. During II, his body is, let us assume, not in the appropriate state C that causes him to get off a straight long drive if he should try. According to (E₄), during II he temporarily lacked the ability, i.e., we could say, of Jones during II, 'He lacks the ability to drive straight and long.' The counterintuitiveness of this consequence suggests that we might, if possible, make a distinction that would allow us to say 'He had the ability during II, but was not able to exercise it.' Let us now turn to proposals of Sellars and Chisholm that enable us to deal with this difficulty, which is located in (E₄) in the undefined expression 'opportun-

Sellars' account of ability is prolific in its introduction of new concepts--he defines four concepts that may
be loosely called types of ability. In order to un­
derstand these four definitions, we must understand some other
concepts which Sellars utilizes as primitives. The complex­
ity of Sellars' account is somewhat formidable, and there­
fore to clearly recapitulate his views ought to be of some
value. I for one feel that Sellars has managed to articulate
nicely a number of concepts that are commonly found in
inchoate form in the vast literature on determinism and
action, and that his views are uniquely worth studying.
First Sellars introduces the physical or causal modalities.
He uses N for 'physically necessary' and M for 'physically
possible.' Thus we have three types of necessity (p. 163).

(a) **Absolute necessity.**
It is absolutely physically necessary that whenever
there is lightning, it thunders.

\[ N \left( (t) \ L (t) \rightarrow T (t + \Delta t) \right) \]

(b) **Hypothetical necessity.**
q is necessary on the hypothesis that p, if, and only
if, p \(\rightarrow\) q is absolutely necessary. That thunder
occurs at \(t_1\) is necessary on the hypothesis that
lightning occurs at \(t_1 - \Delta t\).

\[ N \left( (T (t_1)) \ / \ L (t_1 - \Delta t) \right) \]

(c) **Relative necessity.**
q is necessary relative to the fact that p if, and only
if, 'p \(\rightarrow\) q' obtains and p is the case. An exclamation
mark indicates relative necessity.

\[ N \left( T (t_1) \ / \ L (t_1 - \Delta t) ! \right) \]

Sellars also introduces quantification over states of affairs
and abbreviations for such expressions:

\[ (Ep) \ N \ [q] / p ! \ shortens \ to \ NH \ [q] \]

and

\[ (Ep) \ N \ [q] / p ! \ shortens \ to \ NR \ [q]. \]

Next, the following symbolism is introduced (p. 164).

'A (x,t)' reads: x does A at t.
'VA (x,t)' reads: x wills at t to do A.
't' is short for 't - \Delta t'

---

13Wilfred Sellars, 'Fatalism and Determinism,' in Freedom
and Determinism, ed. Keith Lehrer, Random House, 1966,
pp. 141-174.
On the basis of these terms, the expression 'x is able to do A at t' is defined.

\[ \text{ABLE} [A(x,t)] = \text{df} \ N [ \forall_A (x,t') \rightarrow A(x,t)] \]

Thus a person is able to do an action at t if, were he to will at t' to do A, he would do A at t.

Essentially, what Sellars has done so far is to propose the hypothetical analysis, incorporating in it the primitive concepts of willing and physical necessity. Thus the value of his proposal is directly dependent upon the viability of these two concepts for Action Theory. Reservations about both these concepts are widespread and serious, and thus, for many action theorists, the acceptability of Sellars' scheme is not likely to be more than tentative. There have been proposals for theories of physical necessity, but none is by any means unproblematic. Indeed, all the old familiar problems of causation and explanation are built into the very concept of physical necessity, and hence many critics would want to say that Sellars' account of ABLE begs the question: to utilize a concept like physical necessity (undefined) in an account of ability is a blatant and utterly damning circularity. On the other hand, there are those who will regard the Sellars definition of ABLE as an advance on the ground that physical necessity may be ultimately a viable concept. Even more philosophical hackles will be raised by the concept of willing. Those with inclinations to behaviorism may regard the introduction of this concept as wilful obscurantism. I myself am inclined to feel that the difficulties in verification of sentences containing "willing" make this concept seem unlikely to be scientifically useful as an adjunct to Action Theory. Nevertheless, let us concede Sellars' use of

---

14 The resistance of "physical" or "causal" necessity to analysis has been notorious since Hume. For attempts to make a beginning at an explication, see Hans Reichenbach, *Elements of Symbolic Logic*, MacMillan, 1947, pp. 384-387, and Arthur Burks, "The Logic of Causal Propositions," *Mind*, Vol. 60, 1951, pp. 363-382. Criticisms of "willing" or "volition" have been greatly stimulated by Gilbert Ryle's, *The Concept of Mind*, Hutchinson, 1949.

15 Hume defined the will (Treatise, op. cit., 399) as "the internal impression we feel and are conscious of, when we knowingly give rise to any new motion of our body, or new perception of our mind." Yet it seems questionable whether we ever have such an impression, or how we might know that we are having one. Mill also argued that volition is a
these two primitives for the moment to see what he generates from them, as this will prove philosophically interesting even granting our reservations about some specifics of this way of proceeding.

First Sellars adds some notation.

'Γ' stands for kinds of circumstance.

'II' is a variable for periods of time.

Thus 'Γ (x,II)' is to be read: x is in Γ throughout II. Finally,

'Γ 0' stands for 'P is physically compossible with Q.'

Now the new concepts are introduced. First, the notion of being prevented by the circumstances is defined.

\[ PVT [(Γ , A(x,II))] = df [(Γ(x,II) \bullet V_A(x,II)) \cdot N [Γ(x,II) \rightarrow \sim A(x,II)] \]

Thus to say that x is prevented from doing A by the circumstances throughout II means that x is in a set of circumstances throughout II compossible with his willing to do A, and these circumstances physically necessitate x's failure to do A throughout II.

Now the expressions 'in a position to,' 'can' and 'be able to' can be defined.

\[ POSIT [A(x,II)] = df \sim (E Γ) PVT [Γ , A(x,II)] \]

To say that x is in a position to do A throughout II means that there are no circumstances preventing x from doing A during II. This is quite clearly a version of what we have called the indeterministic analysis. It is easy to see that the same concept, POSIT, can also be defined relative to an instant of time, t:

\[ POSIT [A(x,t)] = df (E ii) \{ t \in II . POSIT [A(x,II)]\} \]

The next two concepts can also be defined for an instant by the same device, but it will suffice to give the definitions for an interval of time. The first definition reads:

necessary component of human action (A System of Logic, Longmans, 1970, 34f.) For a brief account of some modern reactions, see Brand, op. cit., 8f.).
\[
\text{CAN } [A(x, \mathcal{II})] \equiv \text{df } \text{POSIT } [A(x, \mathcal{II})] \rightarrow N [V_A (x, \mathcal{II}) \rightarrow A(x, \mathcal{II})]
\]

To say x has the ability to do A during II means that if x were in a position to do A then x's willing to do A would physically necessitate his doing A. A startling thing about this definition that Sellars fails to recognize is that if we interpret the term 'circumstance' widely enough, the right side appears to become logically true! If we reflect on the following sentence, it might appear that there are no conditions under which it might ever be false: provided that there are no circumstances preventing my doing A, if I will to do A then I will do it. In other words, if I will to do A and fail to do it, then it seems that there must have been some obstacle to my doing it. Whether or not the right side of the definition is actually logically true, thereby making the definition vacuous, is actually a matter of debate, depending pivotally on the interpretation of Sellars' terms 'to will' and 'circumstance.' Yet evidently there is considerable danger of the definition becoming vacuous. One can see the difficulty by reflecting that the apparent usefuless of the definition in Action Theory is in capturing the concept of an ability that may be said to obtain even when the opportunity is absent on some specific occasion. We might want to say that I have the ability to do five chin-ups right now even though I am not in a position to do it (I do not have the opportunity) because there is no bar or other suitable device in this room. Now Sellars' strategy is to say that I am in a position to do it if, and only if, there are no circumstances preventing my doing it. And then he can propose that I have the ability to do it if, and only if, my willing to do it is sufficient for my doing it provided that I am in a position to do it. Thus my having the ability to do five chin-ups does not require my actually being in a position to do it. It merely requires that if I were in a position to do it, I would do it if I willed. But the workability of Sellars' proposal presupposes that the converse will sometimes obtain, i.e., that there will be occasions when I am in a position to do A but I lack the requisite ability. Right now I am in a position to do three hundred push-ups but I lack the ability. According to the Sellars description, there are no circumstances preventing me, yet even if I were to will to do it, I would not do it. The fly in the ointment is that there are circumstances preventing me from doing it, namely, my lack of muscular development, the state of my muscles. Thus if we construe "circumstances" widely enough to include such things as the state of my muscles, the Sellars definition fails to meet its presupposition that there are some occasions where I am in a position to do A
but lack the ability. Whenever I am in a position to do A, in the sense that there are absolutely no circumstances preventing me, then my willing to do A will, in itself, complete the set of conditions sufficient for my doing A.

What is needed is some restriction on the term circumstance. Herein lies the real substance of the distinction between ability and opportunity. Perhaps the circumstances relating to the ability are those that are "in the person" whereas those relating to opportunity are "outside the person," factors relating to external circumstance. Yet however such a distinction might be made, quite clearly the Sellars program requires an explication of it.

A certain amount of our hesitation about the definition under consideration may also be due to the problematic character of the concept of volition. If there is no obstacle to my doing A, does it follow that if I will to do A it must happen that I do A? The question of our acquiescence may turn on what idea we have of willing. Some may think of a volition as something that is always translated into action in the absence of impediment, others may think that a volition need not always produce an action. The converse situation is something of a problem for volition theorists also. Is an action always accompanied by a volition? According to Mill, who argued that volition is a necessary component of human action (op. cit.), it would seem that we cannot call a piece of behavior an action unless it is willed by its author. Yet this seems counter-intuitive, since my blinking my eye appears to be a case of action without volition. As Davidson has observed, to say it is not an action is problematic, yet to say that every eye-blinking is accompanied by a volition raises questions about the intelligibility of the concept of volition. Thus our hesitation over whether or not the right side of Sellars' definition is to be regarded as a genuine definiens or a theorem may be partly attributable to the lack of definitive shape of the concept of volition.

The next definition is of an expression we encountered earlier, namely 'is able to.'

ABLE [A(x,II)] = df POSIT [A(x,II)] . CAN [A(x,II)]

16Donald Davidson, 'The Logical Form of Action Sentences,' in The Logic of Decision and Action, ed. Nicholas Rescher, University of Pittsburgh Press, 81-95. See also Douglas Walton, 'Logical Form and Agency,' Philosophical Studies, forthcoming.
For x to be able to do A means that he is both in a position to do A and that he can do A. Thus the account of ABLE we encountered earlier,

\[ \text{ABLE} [A(x,t)] = N [ V_A (x,t') + A(x,t) ] , \]

is no doubt supposed to be a consequence of the definitions of ABLE and CAN (see below).

Finally, we ought to observe, at the risk of introducing too many complications, that Sellars introduces yet another ability concept more towards the end of his paper (p. 173) which he calls a broader concept than any of the previous ones. Sellars does not say what \( \emptyset \) stands for, but it seems that he means this variable to range over "states." He defines CAP, which I take to refer to "capability" as:

\[ \text{CAP} [ \emptyset (x,II)] = \text{df} \ (\forall E \Gamma ) \ { \Gamma (x,II) \cdot N [ \Gamma , (x,II) + \neg \emptyset (x,II) ]} \]

I have taken the liberty of adding braces to the right side as in the definition of POSIT to indicate that the state of affairs over which he quantifies is the same in both conjuncts--I take it this is what he means to say. Thus to say that x is capable of being in \( \emptyset \) during \( II \) means that there are no circumstances during \( II \) that physically necessitate x's being in \( \neg \emptyset \) during \( II \).

Thus Sellars has defined four ability-like action concepts that could form a basis of the theory of action--'being in a position,' 'has the ability,' 'is able to' and 'is capable of.' I would now like to argue that, in each case, there is a difficulty in the definition. Let us consider his definition of 'prevents,' on which he bases the four definitions above. According to Sellars' definition, if x simply does not do A then it follows that x was prevented from doing A. The definition reads:

\[ \text{PVT} [ \Gamma , A(x,II)] = \text{df} \ (\exists \Gamma ) (x,II) \diamond V_A (x,II)]. \]

Assume \( \neg A (x,II) \). Then it follows that there are circumstances consistent with x's willing to do A during II that physically imply \( \neg A (x,II) \), namely \( \neg A (x,II) \) itself. This objection rests on three assumptions: (i) that a sentence physically implies itself, that is, that the relation of physical necessitation is totally reflexive, (ii) that x's failure to do A can be a circumstance of his not doing A, and (iii) that x's failure to do A is compatible
with his willing to do A. It is hard to see which assumption Sellars might prefer to rebut. In any case, each of the assumptions shows a need for further clarification of a problematic concept that Sellars utilizes as primitive in his scheme—physical necessitation, circumstance and willing. This difficulty is also obviously reflected in Sellars' definition of 'in a position to': if x does not do A throughout II, then it follows, according to Sellars' definition, that x was not in a position to do A during II. And this, of course, is counterintuitive, since intuitively, one is often in a position to do things that one does not do.

The same objection applies to Sellars' concept of capability or what he calls a broader sense of 'able.'

\[
\text{CAP } [ \emptyset (x, II) ] = \text{df } \sim (\text{ET}) \{ \Gamma (x, II), N [ \Gamma (x, II) \rightarrow \sim \emptyset (x, II) ] \}
\]

This definition is similar to POSIT except that the requirement that the circumstances be compatible with x's willing to do A is omitted. According to the above definition, if I fail to be in state \( \emptyset \) during II, then it follows that I am incapable of being in \( \emptyset \) during II. Again, this is highly counterintuitive. A determinist may want to accede to this consequence of the definition, but I, for one, hardly think it is justified to build determinism of this sort into our account of action concepts.

One way to extract the unwelcome implications from CAP (and similarly for POSIT) would be to relativize it to circumstances that obtain for a previous interval. Let II\( \text{P} \) be an interval before II that may stretch right up to the beginning of the interval, but may not be adjacent to it, i.e., share any instants with it. Thus where t is an instant,

\[
\sim (\text{Et}) (t \in II \cdot t \in II\text{P})
\]

and II\( \text{P} \) is before II. The revised definition of CAP will then read:

\[
\text{CAP } [ \emptyset (x, II) ] = \text{df } \sim (\text{ET}) \{ \Gamma (x, II\text{P}) \cdot N [ \Gamma (x, II\text{P}) \rightarrow \sim \emptyset (x, II) ] \}
\]

This account has the somewhat paradoxical consequence that my sitting on Jones during II is not what makes Jones incapable of getting up during II. Rather my sitting on Jones for an interval II\( \text{P} \) is what makes Jones incapable of getting up during II. This oddity, however, may only be a reflection
of the fact that CAP may better be defined over instants of time,

\[
\text{CAP \{ \emptyset (x,t) \} = \text{df } \forall (E \Gamma ) \{ \Gamma (x,t \leftarrow \Lambda t).}
\]

\[
\text{N} \{ \Gamma (x,t \leftarrow \Lambda t) \rightarrow \neg \emptyset (x,t) \}
\]

and then capability over an interval could be defined as an infinite series of capabilities-at-instants over the interval. This, at any rate, is one suggestion for avoiding the difficulty. Another would be to deny 'N (p \rightarrow p)'. According to this strategy, we might differentiate between causal and logical implication, reading 'p \rightarrow q' as 'p causally, but not logically, implies q,' thus excluding logical implication from the relation. This effectively removes the current difficulty, but also produces one that is equally troublesome. According to the revised definition of POSIT, interpreting the '→' to exclude logical implication, I may be in a position to do A and \sim A at the same time. The problem is that, intuitively, Action Theory should rule that I am not in a position to execute those actions whose descriptions are self-contradictory. Yet the cost of excluding such "actions" appears to include the consequence that if I do not do A then it follows that I am not in a position to do A. Moreover, since if I actually do A, I must have been in a position to do A, it follows logically that, as we are now considering POSIT, doing A is equivalent to being in a position to do A. Thus there arises a dilemma for the Sellarsian action theorist. Does the '→' include logical implication or not? If so, we are in a position to do all and only those things that we do in fact do. If not we are in a position to do A and \sim A at the same time. One way out might be to deny that an action can ever have a self-contradictory description. This is the ontological question of the values of the variable, A. This question will eventually need to be settled anyway. There appears to be great disagreement in the literature on what constitutes an action.17 Perhaps a better way out is the one suggested earlier, namely, the strategy of relativizing to circumstances that obtain for a previous interval. It is a familiar argument that "cause" should temporally precede "effect."

Let us continue on to consideration of Sellars' definition of 'has the ability':

\[
\text{CAN \{ A (x,\Pi) \} = \text{df } \text{POSIT \{ A (x,\Pi) \} \rightarrow N \{ V A (x,\Pi) \rightarrow A (x,\Pi) \}}
\]

---

As there is possibility of confusion of CAN with Sellars' first concept under consideration, ABLE, it will be well to try to ascertain the difference between these two concepts. ABLE is defined as:

\[ \text{ABLE } [\text{A}(x,\Pi)] = \text{df POSIT } [\text{A}(x,\Pi)]. \text{ CAN } [\text{A}(x,\Pi)] \]

Thus if we substitute the right side of the definition of CAN, above, in the definition of ABLE, we get

\[ \text{ABLE } [\text{A}(x,\Pi)] = \text{POSIT } [\text{A}(x,\Pi)]. \{ \text{POSIT } [\text{A}(x,\Pi)] \]
\[ + \text{ N } [\text{V}_A(x,\Pi) \rightarrow \text{A}(x,\Pi)] \}

Now presuming that for Sellars' ' \rightarrow ' we have the theorem '[p . (p \rightarrow q)] = (p . q)', the simplified form of the definition of ABLE will read

\[ \text{ABLE } [\text{A}(x,\Pi)] = \text{POSIT } [\text{A}(x,\Pi)]. \]
\[ \text{N } [\text{V}_A(x,\Pi) \rightarrow \text{A}(x,\Pi)] \]

Thus one can see the contrast with CAN quite clearly. Evidently Sellars means to say that you have the ability to do something if, and only if (roughly) if you are in a position to do it then, if you will to do it you will do it. But in order to be able to do it, it is required, in addition, that you actually be in a position to do it. Ability is more iffy than being able, in other words.

Now let us see how Sellars' version of CAN fares against the Lehrer-Chisholm counter-example. Let us envision the familiar case where x can't do A because he can't will to do A, but where he would do A if he were to will to. This seems to provide no problem for Sellars since the right side of his definition of ABLE requires that x be in a position to do A, and this seems not to obtain, since if x can't will to do A then he is not in a position to do A. But we must recall that Sellars' definition of POSIT merely requires that no circumstances physically compossible with his willing to do A rule out x's doing A. And clearly, in the Lehrer-Chisholm model, if x can't will to do A, this may well mean that it is physically incompossible to will to A, i.e., that x's willing to do A is physically impossible with any circumstances, or, in particular, the circumstances in question. Thus we may envision a Lehrer-Chisholm model where the left side of the ABLE-equivalence is false and the right side is true. x is not able to do A, because it is physically impossible for him to will to do A but (i) he is in a position to do A since (while there are circumstances
that physically necessitate his failure to will to do A) there are no circumstances compossible with his willing to do A that physically necessitate his failure to do A, and (ii) his willing to do A physically necessitates his doing A.

Sellars' reply to this, judging from his remarks, would be that it does not make sense to talk of it being physically impossible to will. Willings, in the Sellars scheme of things, are not actions or events (see section II of 'Fatalism and Determinism'), and therefore, presumably, it does not make sense to speak of them in action terms such as physical necessitation. Accordingly, Sellars had defined a broader sense of 'be able' which we have already examined, CAP, which applies to willing.

This strategy has the effect of softening the Lehrer-Chisholm counter-example, but we must observe that it does not eradicate the difficulty entirely. Sellars can now describe the Lehrer-Chisholm model, as envisioned above, as a case where the agent is incapable of willing to do A but where, in his sense, strictly speaking, he is able to do A. This however, may not satisfy all critics. Intuitively, the agent is not able to do A, if he is incapable of willing to do A in the literal sense that the circumstances physically necessitate his not willing to do A (and where his willing to do A is a necessary condition of his doing A). It may be desirable, at certain junctures, to throw intuition out, of course, but this intuitive consequence of Sellars' analysis, I feel, deserves notice, especially as modification of the definitions as follows would eliminate this difficulty. Consider dropping the first conjunct on the right side of the definition of PVT to produce

\[ \text{PVT} \left( \Gamma, A(x,II) \right) = \text{df} N \left( \Gamma (x,II) \rightarrow \neg A(x,II) \right) \]

Then if we keep the definitions of POSIT and ABLE the same, the Lehrer-Chisholm model makes both sides of the ABLE-equivalence false, an acceptable outcome. The right side is ruled false as x is not in a position to do A since there are circumstances that physically necessitate his failure to do A, namely, it is physically impossible for him to will to do A and his willing to do A is a necessary condition of his doing A. I rather suspect that, at bottom, the reason why Sellars eschews this intuitively more satisfactory course is that it does not lend itself as well to the sort of reconciliationism he wishes to argue for. But perhaps to those of us who are less worried about the threat of determinism, the Sellars account may seem like the philosophical tail wagging the conceptual dog.
A recapitulation of the improvement that the various difficulties we have encountered would suggest the following modified versions of Sellars' definitions.

\[
\text{POSIT } [A(x,t)] = \text{ df } \sim (E \Gamma ) \wedge N \left[ \Gamma (x,t-\Delta \tau ) \rightarrow \sim A(x,t) \right]
\]

\[
\text{CAN } [A(x,t)] = \text{ df } [\text{POSIT } A(x,t)] \rightarrow \wedge N \left[ V_x (x,t-\Delta t) \rightarrow A(x,t) \right]
\]

\[
\text{ABLE } A(x,t) = \text{ df } \text{ POSIT } [A(x,t)]. \text{ CAN } [A(x,t)]
\]

and assuming that '[(p \rightarrow (p \rightarrow q)) = (p \quad q)'] is a theorem, we also have as a theorem,

\[
\text{ABLE } [A(x,t)] = \text{ POSIT } [A(x,t)]. \wedge N \left[ V_x (x,t-\Delta t) \rightarrow A(x,t) \right]
\]

Also, we must recall that these definitions rest on the primitive expressions 'VA', 'N', and '→'. And whether these concepts are genuinely useful remains to be seen.

Finally, one further simplification may be tentatively suggested. Sellars does not try to define the concept of circumstance, and, I suspect, it may be a very difficult concept to define satisfactorily. This may suggest its elimination altogether, as an analogy between POSIT and the primitive operation M (read 'physical possibility' defined as '\sim N\sim ') permits this. The predicate T stands for 'is true.'

\[
\text{POSIT } [A(x,t)] = \text{ df } \sim (E \sim p) \wedge \left(T \quad p(t-\Delta) \wedge N \left[p \quad \sim A(x,t) \right] \right)
\]

Thus x is in a position to do A if, and only if, there is no true sentence at t - \Delta t that rules out x doing A at t. And then CAN and ABLE may be defined the same way in terms of POSIT. This would reduce the number of primitives by one at, seemingly, no cost in explanatory power.

The key role of the concept of circumstance may be seen by considering another possible difficulty for POSIT, namely the Chisholm-Taylor counter-example. If Jones is in a position to prevent me from doing A although there are no (other) obstacles to my doing A, does this imply that I am not in a position to do A. It seems to, intuitively. Yet unless Jones' being in a position to interfere counts as a circumstance preventing my doing A then according to the definition of POSIT, counterintuitively, I am in a position to do A. The problem is that, although the relation 'N (p \quad q)' is hardly clear, it seems unlikely that Jones merely being
in a position to interfere, without his actively interfering, ought to count as physically necessitating my failure to do A. Again Sellars' failure to be clearer about physical necessity poses a problem for his analysis. This difficulty appears to obtain no matter which version of POSIT we select of the several we considered.

As a parting shot, two further problems in the Sellars program ought to be mentioned. First, the first arrow, '→', in the definition of CAN may be meant to represent material implication (though Sellars nowhere tells us exactly what it represents). But if so, then where the antecedent of the right side, "POSIT [A(x,II)]" is false, the whole right side is true and thus, by the equivalence, it is true that CAN [A(x,II)]. In other words, wherever I am not in a position to do A, it follows that I can do A. But of course this would be absurd. Now Sellars will probably want to reply that '→' is not material implication. But our question now is: what sort of conditional is it? This must be answered. The second problem for Sellars is that POSIT and ABLE overlap perhaps rather more than he might think. All cases of ABLE are also cases of POSIT (by definition of ABLE), but the converse also obtains for nearly all cases. Presumably the only cases where x is in a position to do A but is not able to do A are cases where x cannot will to do A (i.e., cases like the Lehrer-Chisholm counter-example). Such cases are, however, somewhat rare, and thus for nearly all occurrences, POSIT and ABLE both obtain, i.e., nearly all occurrences of 'can,' 'be able,' etc. will, according to Sellars' account, be ambiguous. Therefore one can't help really feeling that POSIT and ABLE do much the same job, and might better be treated as competing hypotheses rather than as complementary ones in the Humean fashion, and that Sellars' way of mapping the geography of power-concepts might not be the best possible way.

Chisholm\(^\text{18}\) bases his theory of action on a primitive binary relation, 'M p,q', reads as 'He makes it happen that p in the endeavor to make it happen that q.' The arguments of this relation are "states of affairs." Chisholm sets down some semantic conditions on M as follows. First, he argues that if the agent makes it happen that p in the endeavor to make it happen that q, then there is a state of

affairs p and a state of affairs q (p. 205).

\[(A1) \ M_{p,q} \rightarrow (\exists p) \ (\exists q) \ (M \ p, \ q)\]

The notion of quantification over states of affairs is not entirely unambiguous here. Does Chisholm mean that states p and q are actual space-time zones or does he merely mean that they "exist" in the more abstract sense of being generic states of affairs that "exist" generally though not necessarily actually?

The next condition shows clearly that Chisholm means to assert the latter.

\[(A2) \ M_{p,q} \rightarrow p\]

Example: 'He makes it happen that his arm goes up in the endeavor to make it happen that he attracts the chairman's attention.' implies 'His arm goes up.' (p. 206). But, according to Chisholm, he may make it happen that his arm goes up in the endeavor to make it happen that he attracts the chairman's attention, and yet not make it happen that he attracts the chairman's attention. Thus evidently state q need not exist in the usual sense.

Chisholm sets down the condition that

\[M_{p,r,q} = M_{p,q} \cdot M_{r,q},\]

which is suggestive, logically, as it allows for conjunctively molecular states of affairs. Next he sets down another condition which seems to me much less plausible than the one above, namely,

\[(M_{p,q} \cdot M_{r,s}) \rightarrow M_{r,q}\]

In English, if the agent makes p happen in the endeavor to make q happen and makes r happen in the endeavor to make s happen, then, at that time, he makes r happen in the endeavor to make q happen. This appears to me scarcely plausible as it appears to legitimize: if I raise my arm to attract Jones and wink to attract Gloria simultaneously, then it follows that I wink to attract Jones. The final condition that Chisholm sets on M introduces a new primitive (call it 'C') for the causal relation. Thus 'C_{p,q}' reads 'p contributes causally to q.' Let x be the agent.

\[(M_{p,q} \cdot C_{p,r}) \rightarrow C_{x,r}\]

This makes things more complicated as, not only is a new primitive introduced, but it seems that agents as well as
states can be arguments for relations at least in the case of 'C.'

Having acquainted us with his primitive relation(s), Chisholm now defines the familiar action concepts via the defined concepts of undertaking and making happen.

\[(D\ 1)\ \text{He undertakes, (endeavors) makes it happen that } q = \text{df } (\exists p)\ (M\ p,q)\]

His example here suggests that he interprets the quantifier in the more usual sense: 'He undertakes to make it happen that his arm goes up' means 'There is a p such that he makes it happen that p in the endeavor to make it happen that his arm goes up.' Conversely, he makes it happen that p means that there is a q such that he makes it happen that p in the endeavor to make it happen that q:

\[(D\ 2)\ \text{He makes it happen that } p = \text{df } (\exists q)\ (M\ p,q)\]

Thus 'He makes it happen that his arm goes up' means 'There is a state such that he makes it happen that his arm goes up in the endeavor to make this state happen.' In short, to act is to endeavor to make happen. Hence an action, for Chisholm, is always purposive. Although this is not an unfamiliar move, it leads to an unintuitive concept of action, as observed by Davidson.19

Next Chisholm distinguishes between the power of undertaking (which he also calls 'freedom of undertaking') and the power of making happen, and defines the second concept utilizing the first. Then he distinguishes, relative to the second kind of power, between those things that are directly and indirectly in the agent's power to make happen. Thus there are two main definitions:

\[(D\ 8)\ \text{It is within his power to undertake to make it happen that } p = \text{df } \text{There is no sufficient causal condition at or prior to } t \text{ for his not undertaking at } t \text{ to make it happen that } p.\]

\[\text{19Davidson writes in 'the Logical Form of Action Sentences,' op. cit., 86f.: "[considering Chisholm's theory in relation to the example 'Jones batted an eyelash'] nothing will do but "Jones made it happen that Jones batted an eyelash (or some trivial variant), and this cannot be called progress in uncovering the logical form of "Jones batted an eyelash." Vide Walton, op. cit., note 16.}\]
(D 9) It is directly within his power at t to make it happen that $p = df$. There is a $q$ such that (i) it is within his power at t to undertake to make it happen that $q$, and (ii) if he were to undertake at t to make it happen that $q$, he would make it happen that $p$ in the endeavor at t to make it happen that $q$.

Next consider a relation $R p, q$ to read 'making $p$ happen causes it to be directly in the agent's power to make $q$ happen.' This relation is presumably transitive. Thus if we postulate a series of such relations where the initial argument is $p$ and the terminating argument $q$, and $p$ is directly within the agent's power, then the series obtains if, and only if, it is indirectly within the agent's power to make it happen that $q$. Thus it is indirectly within the agent's power to make it happen that $q$ if, and only if, $p$ is directly within the agent's power and

$$R p, p_1 \cdot R p_1, p_2 \cdots \cdot R p_i, R_{i+1} \cdot R p_{i+1}, q$$

Observe, however, that the relation $R$ utilizes the concept of cause. Finally, we can say that making $p$ happen is within the agent's power (simpliciter) if, and only if, $p$ is either directly or indirectly within his power. Thus despite many detailed differences in notation and approach, the Sellars and Chisholm accounts of ability are somewhat similar in main contour.

Yet it must be clearly seen that (D 8) defines the power of undertaking, not the power of doing generally. These two concepts would not appear to be equivalent, since, as we saw earlier, I may have the power to undertake to do A without actually having the power to do A. The converse obtains however. According to Chisholm,20 whenever I have the power to do A it follows that there is no sufficient causal condition for my not undertaking to do A, i.e., by definition, I have the power to undertake to make it happen that A. But if I have the power to undertake to make it happen that A, it does not follow that I have the power to make A happen. As we saw earlier, it seems that I might even be said to have the power to undertake to make it happen that A and $\sim A$ in certain cases, say where there is some $A'$ such that I undertake to do $A'$ in the endeavor to make it happen that $A. \sim A$ (not realizing that nothing can ever make it happen that $A. \sim A$). Thus in this case there is no sufficient causal condition for my not undertaking to make it happen that $A. \sim A$. Why? Because clearly

\[\text{20 'Some Puzzles About Agency,' (op. cit.), p. 211.}\]
there can be no sufficient condition for my not undertaking to do A. \( \sim A \) if I actually undertake to make it happen that A. \( \sim A \). Thus in virtue of the general principle that if I actually do A it follows that I have the power to do A (at least at that time), we can infer that if I do undertake to make it happen that A. \( \sim A \), it follows that I have the power to undertake to make it happen that A. \( \sim A \). In general I have the power to undertake to make anything at all, A, happen (by D8) provided only that there is some A' such that there is no sufficient causal condition for my not making it happen that A' in the endeavor to make it happen that A. The proviso is thus dual: 1. A' must be causally possible, and 2. The agent must do A' in the endeavor to do A. The point to appreciate and remember is that the second condition is subjectively epistemic—it relates only to the agent's subjective estimate of the situation. The agent may quite irrationally or ignorantly set out to undertake to make A' happen in the endeavor to make A happen where an objective estimate of the situation might demonstrate the impossibility of any causal propensity of A' to lead to A. Thus Chisholm is describing the power of undertaking of an agent that may have epistemic limitations. An agent, according to (D8), has the "power" to undertake to make A. \( \sim A \) happen, though of course an agent who realized that A. \( \sim A \) is a contradiction could never have this power. The agent does not have the power to make A. \( \sim A \) happen, of course, what he may possess is the power to undertake to make A. \( \sim A \) happen. This is meant as a clarification of Chisholm's program, not an objection. I believe that it is an important clarification if we are to see the difference between Chisholm's notion 'the power of undertaking' and Sellars' notion 'being in a position.' Both utilize the concept of causal possibility, but Sellars defines the power of acting whereas Chisholm is here only concerned with the power of undertaking. We now see that the power of undertaking is a limited "power." I may have the power to undertake to do A without having the power to do A or even having the power to do anything remotely conducive to the bringing about of A.

Another consequence of (D8) is less tractable. It seems that, according to (D8), I may have the power to undertake to make it happen that I undertake nothing. Intuitively it seems reasonable that I could never have such a power since what I endeavor, namely my undertaking nothing, is defeated logically by my undertaking it. In Chisholm's notation the expression 'I undertake nothing' is rendered as:

\[ \sim (\exists p) \ (\exists q) \ (M p, q) \]

Letting \( \wedge \) stand for this latter sentence, my undertaking to
make it happen that I undertake nothing is written as
'(∃ r) (M ∼, r}'. But the problem here is that ∼ is
logically equivalent to '((∀ p) ∼ (∃ q) (M p, q), which is inconsistent logically with there being some r to which
∼ bears the relation M. In any case, most of us would
likely grant that there is something peculiar about ever
allowing that one might have the power to undertake to make
it happen that one undertake nothing. Yet (D8) allows
this, since there is no sufficient causal condition for my
not undertaking to make it happen that I undertake nothing.
The sentence 'I undertake to make it happen that I under­
take nothing' is perfectly causally consistent, by itself,
although it is logically inconsistent, according to
Chisholm's definition of 'undertaking.'

This problem is introduced by Chisholm's exclusion of
the concept of sufficient logical condition from his concept
of sufficient causal condition. He explicitly states this
in his paper, 'He Could Have Done Otherwise' (Brand, op. cit.,
298): "If C is a sufficient causal condition for E, then C
is a set of events no member of which begins after E begins
and which is such that, it is a law of nature, but not a
law of logic, that if C were to occur then E would occur." This
account of the matter effectively rules out that C is
ever a sufficient causal condition of itself, thus bypassing
the difficulty that we found in Sellars' definition of POSIT.
Without going into the matter further here, my inclination
is to agree with Chisholm that logical sufficiency ought to
be excluded from the definiens as the consequences of
including it may be even more troublesome than the diffi­
culty above.

But how does (D9) stack up against the problems that
faced Sellars' ABLE? Well first, (D9) is not affected by
the Lehrer-Chisholm counter-example. Let us try to set up
a case for (D9) analogous to the case where I can't take a
candy ball because I can't choose to take one, although I
would take one if I chose to. Let us say that there is
some q such that if I were to undertake to make q happen,
I would make it happen that I took a red candy ball in the
endeavor to make it happen that q. But it is not within
my power to take one because it is not within my power to
make q happen. But the last move is blocked by proviso (i)
in (D9). In order for the situation, as envisioned, to
satisfy the definiens it must be within my power to make it
happen that q, as stated by (i). Thus the Chisholm-Taylor
counter-example does not seem to be damaging to (D9), at
least in any obvious way. And proviso (i), moreover, is
itself free from the difficulties of Sellars' POSIT,
phrased as (D9) is in terms of undertaking. Thus (D9) seems
to be unexceptionable aside from the problems introduced
via (D8). Observe, however, that the conditional on the right side of (D9) is undefined—that is (D9) is phrased simply in terms of the English expression 'if . . . then.' This does not detract from its possible soundness as an "equivalence" (in English), but debilitates it as an explication.

An important advantage of the Chisholm scheme over Sellars' scheme is that the relation M has more known properties than Sellars' concept of volition. Although Sellars explicitly denies that volitions are actions or events, I retain a queasy feeling about such entities, given recent diatribes against them, and am inclined to prefer Chisholm's M since it seems less mysterious. Yet there are two difficulties with Chisholm's program that ought to be pointed out as areas for further exploration and debate. First, quantification over "states of affairs" strikes me as somewhat cavalier, and I feel that further clarification of the expression 'state of affairs' is required. Is a state of affairs a space-time zone? Further, might it not be possible to eliminate states of affairs in favor of sentences, so that M p,q might be read as 'He makes it happen that p be true in the endeavor to make q true.' I detect that Chisholm might not be averse to this course. Second, what are the properties of the operator 'N' (physical necessity)? Our earlier considerations suggest that it may fail to share some properties with more familiar modal operators, such as 'L' in Feys' System T: we observed that

\[ p \rightarrow (p \rightarrow q) = (p \rightarrow q) \]  may not hold where neither

\[ p \rightarrow q =_{df} N (p \rightarrow q) \] nor \[ N (p \rightarrow q) \] obtain.

Too many issues turn on 'N' to let it remain an uninvestigated primitive in Action Theory. Simply proceeding on the basis that his operator can intuitively be assumed to have certain properties is not good enough, if some variant of the Chisholm-Sellars program is to command our assent.

A useful starting point in inquiring into these modal concepts is the work of G. H. von Wright. In An Essay in Deontic Logic and the General Theory of Action (North Holland, 1968, 49f.) von Wright suggests that the operator M in a standard modal language (Feys' System T, or the equivalent System M of von Wright) be interpreted as "natural

\[ L p \Rightarrow p \] and \[ L (p \Rightarrow q) \Rightarrow (L p \Rightarrow L q) \], and the Gödel necessitation rule, 'If \( \prec \) is a thesis then \( L \prec \) is a thesis.'
possibility" which is an amalgam of what he calls human possibility and physical possibility. The problem with this proposal is that we seem to have a number of distinct modalities interpreted in the same language, and this does not allow us any formal means of distinguishing among them. Thus we might distinguish several species of alethic modalities, after the manner of Snyder. Snyder distinguishes three ranked species of alethic modality, all of which are interpreted in terms of Hintikka model sets. Theoretical possibility implies conceptual possibility which implies logical possibility.

\[ M_{\text{the}} \prec M_{\text{con}} \prec M_{\text{log}} \]

According to Snyder, logical possibility hinges on the logical structure of statements, conceptual possibility rests on meaning relations among predicates within a statement, and theoretical possibility rests on matters of physical or scientific theory. Thus it is theoretically impossible for me to walk unaided on the ceiling although it is both logically and conceptually possible for me to do so. The usefulness of such varieties of modal distinctions is a question of current philosophical debate, yet

---

22 D. Paul Snyder, Modal Logic and Its Applications, Van Nostrand Reinhold, 1971, ch. IV.


24 An early modal logic skeptic, Frege wrote in his Begriffsschrift (first published in 1879):

What distinguishes the apodeictic from the assertoric judgment is that it indicates the existence of general judgments from which the proposition may be inferred—an indication that is absent in the assertoric judgment. If I term a proposition 'necessary,' then I am giving a hint as to my grounds for judgment. But this does not affect the conceptual content of the judgment; and therefore the apodeictic form of a judgment has not for our purposes any significance.

it is clear that if any determinate shape is to be given to the causal primitives found in the Sellars-Chisholm style of Action Theory, we must look to these new modal logics.25

The most problematic aspect of this style of Action Theory is its utilization of teleological concepts like volition and undertaking. Many behavioral scientists are highly suspicious of such concepts as they seem to be remnants of prescientific vocabulary—in Skinner's terminology, they are concepts of that obstacle to modern scientific progress—autonomous man.26 For Sellars, such concepts belong to the "manifest image" of man, yet they become of greater interest, especially for the behavioral scientist, if Frege is right, words like 'must' and 'may,' 'necessary' and 'possible,' involve a covert reference to human knowledge for which there is no place in pure logic, and it is a mistake to suppose with Aristotle and his followers that it is any part of the logician's task to set forth rules of inference applicable only to modal propositions. Many of Frege's successors in logic have agreed with this view, but others have argued that Frege's work should be supplemented by a theory of modality because the notions of necessity and impossibility do not belong, as he thought, to epistemology, or indeed to any special science except logic itself. Given the skepticism of some writers about the logical credentials of modal system, Snyder's exotic varieties may be expected to be challenged by many.

25 Two other relevant papers in this area are:


Hilpinen extends the Hintikka model sets semantics to sets of model sets called model systems, postulating a concept of possibility relative to sets of individuals. Stalnaker develops a new conditional connective utilizing a Kripke-type semantics.

if they are susceptible to reduction to empirical concepts or to more familiar scientific constructs. Otherwise, there is some substance to the behaviorist charge that such concepts are as unhelpful as the concept of entelechy in biology. According to Skinner, "so long as the findings and methods of science are applied to human affairs only in a sort of remedial patchwork, we may continue to hold any view of human nature we like. But as the use of science increases, we are forced to accept the theoretical structure with which science represents its fact."27

A more standard psychological account of the concept of ability is to treat it as an operational concept. Roughly speaking, this means that given certain test conditions, if a subject performs in a certain way then he has a certain ability. The test conditions are never completely specified, for all cases of ability, so that as we construct new tests for ability, we find out more and more about ability. Thus the operational definition has the logical form \( Q_1 \supset (Q_2 \supset Q_3) \) (with variants), where \( Q_1 \) describes experimental conditions which we have to fulfill in order to find out whether property \( Q_3 \) obtains. \( Q_2 \) describes possible results of the experiments.28 According to this account of the matter, the "definition" is not explicit, providing necessary and sufficient conditions and having the form \( Q_3 \equiv (Q_1 \supset Q_2) \) but is rather a definition in use, that increases in power as further experiments are performed.

In the statement of the experimental conditions, one variable is the degree of difficulty of the task as well as the type of task involved. Abilities vary with the difficulty of the task.29 A person may have the ability to swim in calm water but his ability may not extend to very rough water. Furthermore, different types of ability may be distinguished. The techniques of factor analysis in the area of intelligence testing provide an illustration of a method of isolating

---


types of ability. How factors should be identified and named is somewhat controversial. But it is clear, according to P. E. Vernon, that a factor is not to be identified with a "faculty which is hypothetical mental power." Rather a factor is a set of correlations in a battery of tests that allows the classification of the tests into a category or underlying factor. These methods appear to favor an operational approach to the definition of ability. Yet, as Baldwin observes, a model for ability is surprisingly lacking in the literature--concepts such as drive, habit, anticipatory goal response and secondary reinforcement have emerged while an "ability" concept has not. This suggests to Baldwin that a purely logical and theoretical analysis of the concept of ability might prove to be very fruitful as a supplement to existing empirical studies in the area. Thus the Sellars-Chisholm type of Action Theory is a step in more or less the right direction and might prove fruitful with more coordinated guidance from psychology and modal logic.

B. F. Skinner has suggested a solution, or perhaps a dissolution of the problem that is paradoxical, yet suggests a different way of looking at it.

In the present analysis we cannot distinguish between involuntary and voluntary behavior by raising the issue of who is in control. It does not matter whether behavior is due to a willing individual or a psychic usurper if we dismiss all inner agents of whatever sort. Nor can we make the distinction on the basis of control or lack of control, since we assume that no behavior is free. If we have no reason to distinguish between being able to do something and doing it, such expressions as "not being able to do something" or "not being able to help doing something" must be interpreted in some other way. When all relevant variables have been arranged, an organism will or will not respond. If it does not, it cannot. If it can, it will. To ask whether someone can turn a handspring is merely to ask whether there are circumstances under which he will do so. A man who can avoid flinching at gunfire is a man who will not flinch under certain circumstances. A man who can hold still while a dentist works on his teeth is one who holds still upon certain occasions.

---

31 Baldwin, op. cit., p. 196.
The paradox is that, according to the proposal, an organism can do anything at all, since there are some circumstances in which the organism will do anything. Thus I can leap over tall buildings in a single bound, according to Skinner's account of be able, since in the circumstance in which I have the requisite properties of Superman and there is an available high building that I am motivated to jump over, I will do so. (The protest that such circumstances are not possible is not reasonable, since this sense of 'possible' is just what the proposal in question purports to explicate.) If all the circumstances are allowed to be variable, then anything can happen. Clearly Skinner ought to recognize that some circumstances must be assumed to be fixed in the judgment of an ability. Thus it is false that I am able to leap over tall buildings in a single bound, since we can assume that it is a "fixed" circumstance that I do not share certain fantastic properties with Superman. Thus given the present state of the world, it does not follow from the availability of a building and so on that I will jump over. Thus Skinner should say that I am able to do A if, and only if, given a certain fixed set of statements, W, if certain circumstances Ψ obtain (the independent variables) then I will do A. Now the interesting question that the action theorists are concerned to answer may be formulated: 'How may we characterize sets W and Ψ?'

Skinner's reply, judging from the above quotation, would likely be the skeptical one that it is simply a matter of context, pragmatics, or our interests of the moment which set of circumstances we include in Ψ. According to Skinner, all contingencies ought to be considered on a par--there are no "internal" contingencies corresponding to abilities and "external" ones corresponding to particular circumstances or opportunities not of the ability type. Physiological and genetic evidence is relevant to abilities, according to Skinner, but in any special way, and even this type of "internal" evidence can be traced to contingencies in the history of the environment of the organism. So Skinner appears to be a skeptic about the Sellars-Chisholm type of program for action theory. For him the Sellarsian distinction between ABLE, POSIT and CAN would seem to be a dogma of autonomous man.

Skinner's proposal does provide the outlines of a reduction schema for ability-statements but it can hardly be said to offer an analysis. According to our modification of the scheme we may translate an ability statement into the form

\[ W \rightarrow Ψ \rightarrow A \]
Given a fixed set, $W$, a set $\Psi$ implies that the organism will do $A$. 'I can do a handspring' means that given the present state of my muscles and so on ($W$), if I am presented with a flat surface, and my arms and legs are not bound and so on ($\Psi$) then I will do a handspring. The world, $W$, is assumed to be fixed in all relevant respects, then we assume the truth of certain other statements, $\Psi$. If $W$ and $\Psi$ jointly imply $A$ then the organism is able to do $A$, otherwise not.

In Skinner's handspring example, $W$ includes statements about my physiological make-up, perhaps also statements about my learning history. $\Psi$ contains statements of antecedent conditions of my hypothetical action, such as my motivation at the time, the physical circumstances of my immediate environment at the time. The question for the action theorist who wishes to make this reduction schema into an analysis of ability is whether there are various types of $\Psi$-sets that can be identified. We have already seen the Sellars-Chisholm claim that there are such criteria of identification in virtue of willing or undertaking. But since behaviorists are likely to reject the use of such concepts of "autonomous man," the question for the behavioristically inclined action theorist is whether $\Psi$-sets can be identified without appeal to "internal" concepts.

If we try to place Skinner's proposal on the indeterministic-hypothetical spectrum, we find that its logic is more hypothetical than indeterministic. We have observed that the logic of Skinner's proposal can be represented as

$$(H) \quad W \implies \Psi \implies A$$

In contrast, the indeterministic hypothesis has the form

$$(I) \quad \sim (W \implies \Psi \implies \sim A)$$

$(H)$ asserts that the union of $W$ and $\Psi$ imply $A$ whereas $(I)$ merely asserts that the union of $W$ and $\Psi$ are consistent

---

33 For the use of constants to represent sets of contingent truths see:
with $A$. Thus (H) implies (I) but the converse does not obtain. (H) is the stronger statement. Hence the logical structure of Skinner's proposal is essentially that of the hypothetical analysis; where he differs with the usual statements of the hypothetical analysis in the philosophical literature is in his refusal to try to characterize the set $\Psi$; in this respect he is a skeptic about Action Theory.

Broadly speaking, what emerges from our considerations on these existing formalisms is the need to distinguish generally between an "opportunity" concept that relates to the possibility of undertaking a specific spatio-temporally localized action by an agent, and an "ability" concept, an underlying generalized notion of competence concerned with how an agent will generally perform under certain test-conditions. The key issue revolves around conceptual difficulties on talking about relating externally observable behaviors to intentions, capacities, abilities and opportunities that cannot be similarly observed. Let us sketch here in bold strokes the basis of the fundamental distinction that will help to organize and consolidate our conceptual gains in facing this important issue. First, the nihil obstat or indeterministic conception is best seen as providing us with a model for exploring the notion of opportunity or being in a position to do $x$. Here we might suggest, as a basis for further exploration, that this concept might be treated as a modal operator conforming to the following two axioms, where $p$ is a sentence of the form 'x does $A$.'

$$ (A_1) \quad p \supset x \text{ posit } p $$

$$ (A_2) \quad x \text{ posit } (p \lor q) \equiv \cdot x \text{ posit } p \lor x \text{ posit } q $$

This proposal would, in effect make posit isomorphic with the M-operator in von Wright's basic System M of modal logic. The concept of ability does not, by contrast, conform to $(A_1)$ and $(A_2)$. Simply because I bring it about that $p$, it does not follow that I have the ability to do $p$ generally (I may be just lucky on this occasion, for example). As for $(A_2)$, consider the case in which I know two identical twins whom I cannot tell apart. I have the ability to point to either Tweedledum or Tweedledee, but it is not true that I have the ability to point to Tweedledum or that I have the ability to point to Tweedledee.34 Thus

(A_1) and (A_2) afford a formal means of decisively distinguishing between posit and abil. posit can be pursued through (A_1) and (A_2) and further exploration of the nihil obstat model. abil, I would like to suggest, is best pursued along the general lines suggested by the formalisms of Sellers and Chisholm, but without incorporating the undefined concepts of willing or volition. Yet even an awareness of the clear distinction between abil and posit, a familiarity with the basic logical problems of explication, as outlined in the foregoing, ought to be sufficient to warrant the belief that this sorely needed distinction is worth pursuing in the direction of an underlying Theory of Action. In the practical world, these problems are of very real importance in understanding the foundations of all the domains of assessment of ability. What exactly are we measuring in an intelligence test? Is it really possible to measure "management ability"? Do children fail to show their intrinsic abilities in school situations because they are not suitably motivated? Are skills really acquired through decisions rather than conditioning? These are important questions that fail to be resolved because no logically consistent or coherent way of talking about their content is available. Out of the controversies between indeterminists and hypotheticalists, a more constructive approach to sorting out the complexities of the logic of ability is needed, with a greater sympathetic rapprochement between Action Theory and the social sciences.

Douglas Walton

The University of Winnipeg
515 Portage Avenue
Winnipeg, Manitoba.
R3B 2E9