

# NEW FOUNDATIONS FOR IMPERATIVE LOGIC III: A GENERAL DEFINITION OF ARGUMENT VALIDITY\*

Peter B. M. Vranas  
vranas@wisc.edu  
University of Wisconsin-Madison  
12 December 2015

**Abstract.** Besides *pure declarative* arguments, whose premises and conclusions are declaratives (“you sinned shamelessly; so you sinned”), and *pure imperative* arguments, whose premises and conclusions are imperatives (“repent quickly; so repent”), there are *mixed-premise* arguments, whose premises include both imperatives and declaratives (“if you sinned, repent; you sinned; so repent”), and *cross-species* arguments, whose premises are declaratives and whose conclusions are imperatives (“you must repent; so repent”) or vice versa (“repent; so you can repent”). I propose a general definition of argument validity: an argument is valid exactly if, necessarily, every fact that *sustains* its premises also sustains its conclusion, where a fact sustains an imperative exactly if it favors the satisfaction over the violation proposition of the imperative, and a fact sustains a declarative exactly if, necessarily, the declarative is true if the fact exists. I argue that this definition yields as special cases the standard definition of validity for pure declarative arguments and my previously defended definition of validity for pure imperative arguments, and that it yields intuitively acceptable results for mixed-premise and cross-species arguments.

## 1. Introduction

Consider the following dialogue from Joseph Heller’s novel *Catch-22* (1961/1994: 54-5):

“Can’t you ground someone who’s crazy?”

“Oh, sure. I have to. There’s a rule saying I have to ground anyone who’s crazy.” ...

“Is Orr crazy?”

“He sure is,” Doc Daneeka said.

“Can you ground him?”

“I sure can. But first he has to ask me to. That’s part of the rule.” ...

“And then you can ground him?” Yossarian asked.

“No. Then I can’t ground him.”

“You mean there’s a catch?”

“Sure there’s a catch,” Doc Daneeka replied. “Catch-22. Anyone who wants to get out of combat duty isn’t really crazy.”

Here is one way to understand Doc Daneeka’s (implicit) argument:

Rule: Ground anyone who is crazy, but if and only if he asks to be grounded.

Catch-22: Anyone who asks to be grounded is not crazy.

Conclusion: Don’t ground anyone who is crazy.

---

\* I am grateful to Daniel Boisvert, Joseph Fulda, Alan Hájek, Casey Hart, Ryan Millsap, David O’Brien, Josh Parsons, Manidipa Sanyal, Michael Titelbaum, and especially Aviv Hoffmann, Joshua Schechter, and several anonymous reviewers for comments. Thanks also to Martin Barrett, John Bengson, John Bishop, Anna Brožek, Heather Dyke, Branden Fitelson, Molly Gardner, Paula Gottlieb, Casey Helgeson, Jacek Jadacki, Matt Kopec, Jonathan Lang, John Mackay, Andrew Moore, Jakub Motrenko, Charles Pigden, Gina Schouten, Benjamin Schwan, Larry Shapiro, Elliott Sober, Ivan Soll, Reuben Stern, and Berislav Žarnić for interesting questions, and to my mother for typing the bulk of the paper. Material from this paper was presented at the 7th Formal Epistemology Workshop (September 2010), the University of Otago (December 2011, via Skype), the 2012 Central APA meeting (February 2012), the University of Wisconsin-Madison (Department of Mathematics, April 2012, and Department of Philosophy, May 2012), the University of Warsaw (May 2012), and the Beijing Normal University (August 2012).

Does the conclusion follow from the rule and the catch? In other words, is the above argument (deductively) valid? Some people may think so. But the first premise and the conclusion are imperatives, not propositions. If imperatives cannot be true or false, then to say that the above argument is valid is not to say that, necessarily, its conclusion is true if its premises are true. What is it, then, for the above argument and similar ones to be valid? The development of a satisfactory answer to this question is a major object of the present paper. This is not a purely academic question: as I have argued elsewhere (Vranas 2010), inferences with an imperative conclusion and at least one imperative premise occur with some regularity in everyday life.

To formulate the above question more precisely, distinguish imperative *sentences* from what such sentences typically express, namely what I call *prescriptions* (i.e., commands, requests, instructions, suggestions, etc.). This distinction is analogous to the familiar distinction between *declarative* sentences and what such sentences typically express, namely *propositions*. Given that a declarative sentence (like “you will stand guard until midnight”) can express a prescription, and that an imperative sentence (like “marry in haste and repent at leisure”) can express a proposition, I prefer to take the premises and conclusions of arguments to be propositions or prescriptions rather than declarative or imperative sentences (although nothing substantive in this paper hangs on this preference, and my main results can be easily reformulated in terms of sentences). So I define an *argument* as an ordered pair whose first coordinate is a non-empty set of propositions or prescriptions or both (the *premises* of the argument) and whose second coordinate is either a proposition or a prescription (the *conclusion* of the argument). I call an argument *declarative* exactly if its conclusion is a proposition, and *imperative* exactly if its conclusion is a prescription. I call an argument (1) *pure* exactly if its premises and its conclusion are either all propositions or all prescriptions, (2) *mixed-premise* exactly if its premises include both a proposition and a prescription, and (3) *cross-species* exactly if either its premises are all propositions and its conclusion is a prescription or its premises are all prescriptions and its conclusion is a proposition. (I call an argument *mixed* exactly if it is not pure; equivalently, exactly if it is either mixed-premise or cross-species.) Table 1 combines the above distinctions and gives, for each possible combination, an argument that might appear valid (although, as I argue later on, not all arguments in the table are in fact valid).

		Declarative arguments (the conclusion is a proposition)	Imperative arguments (the conclusion is a prescription)
Pure arguments		<i>Pure declarative arguments</i> E.g: He sang two songs _____ He sang at least two songs	<i>Pure imperative arguments</i> E.g.: Honor your mother and your father _____ Honor your mother
Mixed arguments	Mixed-premise arguments	<i>Mixed-premise declarative arguments</i> E.g.: If he loves you, marry him You will not marry him _____ He doesn't love you	<i>Mixed-premise imperative arguments</i> E.g.: If you love him, marry him You love him _____ Marry him
	Cross-species arguments	<i>Cross-species declarative arguments</i> E.g.: Don't touch my sister _____ I have a sister	<i>Cross-species imperative arguments</i> E.g.: You have a conclusive reason to dance _____ Dance

Table 1. A taxonomy of arguments.

Given the above terminology, one may ask: what is it for a mixed-premise imperative argument (like the argument in the *Catch-22* example) to be valid? In this paper, I answer this question and related ones by proposing a *general* definition of argument validity: a definition that applies to *all* kinds of arguments I distinguished above. I argue (§2) that my definition yields as special

cases both the standard definition of validity for pure declarative arguments and a definition of validity for pure imperative arguments that I have defended elsewhere (Vranas 2011). Then I argue that my definition yields intuitively acceptable results for cross-species imperative arguments (§3), cross-species declarative arguments (§4), mixed-premise declarative arguments (§5), and mixed-premise imperative arguments (§6). I conclude in §7, and in the Appendix I examine alternative definitions of argument validity.

This paper is a sequel to two other papers (Vranas 2008, 2011) but does not presuppose any familiarity with those papers. For the moment I need only the following definitions from those papers. A *prescription* is an ordered pair of (logically) incompatible propositions, namely the *satisfaction proposition* (the first coordinate of the pair) and the *violation proposition* (the second coordinate of the pair) of the prescription. The disjunction of those two propositions is the *context* of the prescription; the negation of the context is the *avoidance proposition* of the prescription. A prescription is *unconditional* exactly if its avoidance proposition is (logically) impossible (equivalently, its context is necessary; still equivalently, its violation proposition is the negation of its satisfaction proposition), and is *conditional* exactly if it is not unconditional. A prescription is *satisfied*, *violated*, or *avoided* exactly if, respectively, its satisfaction, violation, or avoidance proposition is true. For example, the prescription (expressed by—addressing to you—the imperative sentence) “if it thunders, dance” is satisfied exactly if it thunders and you dance (regardless of whether you dance *because* it thunders; see Vranas 2008: 534, 2013: 2577), is violated exactly if it thunders and you do not dance, and is avoided exactly if it does not thunder. Since this prescription can be avoided, it is conditional; its context is the proposition that it thunders. By contrast, the prescription “dance” is unconditional; it is satisfied exactly if you dance, it is violated exactly if you do not dance, and it cannot be avoided.

## **2. A general definition of argument validity**

### **2.1. A first desideratum: Combining and splitting premises**

The task of defining argument validity can be simplified by noting that one need only consider mixed-premise arguments with a *single* declarative premise and a *single* imperative premise. This is because one wants a definition of argument validity on which one can combine multiple declarative or multiple imperative premises by conjunction into a single premise and one can split a single premise which is a conjunction of certain conjuncts into multiple premises (the conjuncts) without affecting validity—just as one can do for pure declarative and for pure imperative arguments on standard definitions of validity for such arguments. More formally, it is desirable for a definition of argument validity to have the following consequence (cf. Smart 1984: 17):

- (D1) A mixed-premise argument *A* is valid exactly if the *two-premise* argument *A'* is valid whose single declarative premise is the conjunction of the declarative premises of *A*, whose single imperative premise is the conjunction of the imperative premises of *A*, and whose conclusion is the conclusion of *A*.

(For the moment it does not matter how exactly one defines the conjunction of prescriptions; I give my definition in §4.<sup>1</sup> I see no way to simplify matters even further by conjoining the single

---

<sup>1</sup> If one understands propositions as sets (e.g., of possible worlds), then one can define the conjunction of infinitely many propositions or prescriptions (see Vranas 2008: 545). Those who do not want to talk about the conjunction of infinitely many propositions or prescriptions can restrict their attention to arguments with finitely many premises.

declarative with the single imperative premise, because I see no interesting way to define the conjunction of a proposition with a prescription; see Vranas 2008: 543-4.<sup>2</sup>) Similar observations can be made about cross-species (and pure) arguments, whose premises can be combined by conjunction into a *single* premise because they are either all propositions or all prescriptions. Unless I specify otherwise, in what follows I should be understood as referring only to *two-premise* mixed-premise arguments, and only to *single-premise* cross-species and pure arguments.

## 2.2. A second desideratum: Transmission of meriting endorsement

A *declarative* argument is “fully successful” (i.e., *sound*) only if its conclusion is *true*. Similarly, I submit, an *imperative* argument is fully successful only if its conclusion is *supported by reasons*: reasons for acting (e.g., if the conclusion is “donate to charities”), reasons for feeling (e.g., if the conclusion is “love your enemies”), reasons for believing (e.g., if the conclusion is “believe whatever the Pope says”), and so on.<sup>3</sup> To have a uniform terminology for propositions and prescriptions, say that a proposition *merits endorsement* exactly if it is true, and that a prescription *merits endorsement* exactly if it is supported by reasons.<sup>4</sup> (If one finds this terminology objectionably subjective, one is welcome to use a more objective-sounding term; for example, say that a proposition is *factual* exactly if it is true, and that a prescription is *factual* exactly if it is

---

<sup>2</sup> One might argue that the sentence “I understand why you hit him, but now apologize” expresses the conjunction of the proposition that I understand why you hit him with the prescription “now apologize”. But what kind of entity is the conjunction? If the conjunction is true exactly if I understand why you hit him, then the conjunction is not a prescription (since prescriptions cannot be true or false); and if the conjunction is satisfied exactly if you now apologize, then the conjunction is not a proposition (since propositions cannot be satisfied or violated). Maybe, then, the conjunction is the unordered pair whose members are the proposition and the prescription. But then no simplification is achieved by conjoining the single declarative with the single imperative premise.

<sup>3</sup> One might claim that an imperative argument is fully successful only if its conclusion is *obeyed* (e.g., only if one donates to charities, if the conclusion is “donate to charities”). I reply that an imperative argument can be fully successful even if its conclusion is not obeyed, for example due to weakness of will (or because you die). For example, if I adduce an argument which (correctly) convinces you that the balance of reasons supports the prescription “confess” but you fail to confess due to weakness of will, it does not follow that there is anything wrong with my argument. Compare: if I adduce a sound pure declarative argument for the conclusion that there are irrational numbers but you irrationally refuse to believe this conclusion, it does not follow that there is anything wrong with my argument.

<sup>4</sup> One might argue that the property of being true is very different from the property of being supported by reasons, so calling both properties “meriting endorsement” achieves only a *terminological*—but no *real*—unification of declarative and imperative arguments. I reply that the two properties are not so different after all because a proposition (that can be believed) is true exactly if there is an *objective epistemic* reason to believe it. To see what I mean, recall first the distinction between subjective and objective normative reasons *for action*: if I am thirsty and the liquid in the bottle is petrol but my evidence unambiguously indicates that it is water, then there is a subjective reason for me to drink it but an objective reason for me not to drink it. (If there is no objective reason for me to drink it, then no argument with the conclusion “drink the liquid in the bottle” is fully successful; this suggests that an imperative argument is fully successful only if its conclusion merits endorsement in the sense of being supported by *objective* reasons.) One can make a similar distinction between subjective and objective *epistemic* reasons: in the above example, there is a subjective epistemic reason for me to believe that the liquid is water, but there is an objective epistemic reason—namely the fact that the liquid is petrol—for me to believe that the liquid is petrol (although I have no evidence that it is petrol; cf. Gibbard 2005: 340-1). Given that a proposition (that can be believed) is true exactly if there is an objective epistemic reason to believe it, there is a sense in which, both for propositions and for prescriptions, meriting endorsement amounts to being supported by objective reasons (although it is objective *epistemic* reasons for propositions, but objective reasons *of any kind* for prescriptions; see note 16). Nevertheless, my claims about objective epistemic reasons might be considered controversial, so for propositions I will stick to defining meriting endorsement as being true.

supported by reasons.) Then any argument, declarative or imperative, is fully successful only if its conclusion merits endorsement (i.e., is factual). This suggests that it is desirable for a definition of argument validity to have the following consequence:

(D2) An argument is valid only if, necessarily, if its premises merit endorsement, then its conclusion merits endorsement.<sup>5</sup>

To make this suggestion precise, however, three groups of issues need to be addressed.

### 2.2.1. Reasons and support

What is a reason, and what is it for a reason to support a prescription? I take a (normative and comparative) reason to be a *fact* that counts in favor of—in short, that *favors*—some proposition over some other one. For example, a reason for you to repent (rather than not repenting) is a fact that favors the proposition that you repent over the proposition that you do not repent, and a reason for you to marry Hugh rather than Hugo is a fact that favors the proposition that you marry Hugh over the proposition that you marry Hugo. I take a reason to *support* a prescription exactly if it favors the satisfaction proposition over the violation proposition of the prescription. For example, a reason supports the prescription “if you drink, don’t drive” exactly if it favors the proposition that you drink and do not drive over the proposition that you drink and drive. (Strictly speaking, I distinguish *strong* from *weak* support, but I postpone discussing this distinction until §6.1.) The above remarks are not enough to determine whether any given fact is a reason or supports any given prescription; but determining this lies beyond the scope of logic, so in this paper I take the relation of favoring to be primitive. For the moment I only assume that favoring is *asymmetric*: necessarily, any fact that favors a proposition *P* over a proposition *P'* does not also favor *P'* over *P*.<sup>6</sup> (See Vranas 2011: 381-4 for further discussion of the issues in this paragraph.)

### 2.2.2. Meriting endorsement jointly versus separately

There is a relation—call it *guaranteeing*—between facts and propositions which is in an important respect analogous to the relation of *supporting* between facts and prescriptions: a fact *guarantees* a proposition exactly if, necessarily, the proposition is true if the fact exists (i.e., is a fact).<sup>7</sup> For example, the fact that Strasbourg is in France and Salzburg is in Austria guarantees

---

<sup>5</sup> I understand D2, like D1 and all definitions in this paper, as prefixed with “necessarily”. (Necessity and validity are understood *logically* or *conceptually* throughout this paper—cf. note 30 and corresponding text—but could also be understood *metaphysically*; cf. Vranas 2011: 376-7 n. 7.) If one assumes that (1) the accessibility relation between possible worlds is reflexive and transitive (i.e., whatever is necessary is both true and necessarily necessary) and (2) necessarily, every valid argument is necessarily a valid argument, then one can show that D2 is equivalent to: necessarily, if an argument is valid and its premises merit endorsement, then its conclusion merits endorsement (cf. Vranas 2011: 375). (In this paper, I assume that the accessibility relation between possible worlds is an equivalence relation—see Burgess 1999, 2003 for a defense of the claim that the correct system of (propositional) modal logic for *logical* necessity is S5—but I specify weaker assumptions about accessibility that are sufficient for particular results.)

<sup>6</sup> Except perhaps if *P* and *P'* are both impossible, so that the prescription whose satisfaction proposition is *P* and whose violation proposition is *P'* is *empty* (i.e., its context is impossible; e.g., “if 2+2 is 5, dance”): as it turns out, adopting the *convention* that empty prescriptions are necessarily supported by every reason considerably simplifies certain results. I will not elaborate because in the sequel (except in notes 47 and 63) I ignore empty prescriptions: whenever I (implicitly) use a quantifier ranging over prescriptions, I assume that it ranges only over non-empty prescriptions.

<sup>7</sup> I define *guaranteeing* (and *supporting*) so that, necessarily, only facts guarantee propositions (and only facts support prescriptions). I assume that, necessarily, if something is a fact then, necessarily, it is a fact exactly if it

the proposition that Strasbourg is in France. Guaranteeing and supporting are in an important respect analogous because, as I will argue, (1) a *prescription* merits endorsement exactly if it is *supported* by some fact, and (2) a *proposition* merits endorsement exactly if it is *guaranteed* by some fact. (1) holds because, by definition, a prescription merits endorsement exactly if it is supported by *reasons*, but every reason is a fact and every fact that supports a prescription favors some proposition over some other one (namely the satisfaction proposition over the violation proposition of the prescription) and thus is a reason. (2) holds because a proposition which is guaranteed by some fact is true (i.e., merits endorsement) and, conversely, a true proposition is guaranteed by the fact that it is true: necessarily, the proposition is true if the fact that the proposition is true exists. (I assume that, necessarily, if a proposition is true, then it is a fact that the proposition is true, even if the proposition is necessary. This assumption might be rejected by opponents of “negative facts” (cf. Molnar 2000: 76-80; contrast Barker & Jago 2012) or of facts in general, but these opponents are welcome to replace my talk of facts with talk of true propositions, and thus to take reasons to be true propositions rather than facts.) To have a uniform terminology for propositions and prescriptions, say that a fact *sustains* a proposition exactly if it guarantees the proposition, and that a fact *sustains* a prescription exactly if it supports the prescription. Then a proposition or a prescription merits endorsement exactly if it is sustained by some fact. Table 2 recapitulates some major definitions and equivalences for ease of reference.

	Propositions	Prescriptions
Sustaining	A fact <i>sustains</i> (i.e., <i>guarantees</i> ) a proposition exactly if, necessarily, the proposition is true if the fact exists.	A fact <i>sustains</i> (i.e., <i>supports</i> ) a prescription exactly if it favors the satisfaction proposition over the violation proposition of the prescription.
Meriting endorsement	A proposition <i>merits endorsement</i> exactly if it is <i>true</i> ; equivalently, exactly if it is <i>sustained</i> (i.e., <i>guaranteed</i> ) by some fact.	A prescription <i>merits endorsement</i> exactly if it is <i>supported by reasons</i> ; equivalently, exactly if it is <i>sustained</i> (i.e., <i>supported</i> ) by some fact.

Table 2. Sustaining, guaranteeing, supporting, and meriting endorsement.

One might claim that the concept of sustaining is “an objectionable gerrymander—a disjunction of [guaranteeing and supporting] designed to create the illusion that two quite different [concepts] have something in common” (cf. Parsons 2013: 81). To support this claim, one might point to disanalogies between supporting and guaranteeing: supporting is contingent (see Vranas 2011: 377 n. 8) but guaranteeing is not, supporting (or rather favoring) is primitive but guaranteeing is not, and supporting is normative (since it entails the existence of a reason) but guaranteeing is not. I reply that the concept of meriting endorsement (which corresponds to the concept of sustaining) is arguably not gerrymandered: both for prescriptions and for propositions, meriting endorsement is contingent, non-primitive, and normative (see note 4).<sup>8</sup> In any case, nothing substantive hangs on my choice to adopt a uniform terminology for propositions and prescriptions; the terminology is primarily intended to yield a compact formulation of my general definition of argument validity (§2.3).

---

exists. (So, necessarily, every fact exists, and a fact could not have existed without being a fact.) If one accepts what Rodriguez-Pereyra (2006: 958) calls a “traditional definition of truthmaking” (namely: *e* is a *truthmaker* for a proposition *P* exactly if (1) *e* exists and (2) the proposition that *e* exists entails *P*), then a fact guarantees a proposition exactly if the fact is a truthmaker for the proposition. But that definition of truthmaking is controversial, so I avoid any further talk of truthmakers in this paper.

<sup>8</sup> I grant, however, that a disanalogy remains: for prescriptions, but not for propositions, meriting endorsement is relative to times, agents, and normative perspectives (moral, legal, etc.), as I explain in note 13. I discuss some implications of this disanalogy in notes 19, 23, 41, and 66.

With the concept of sustaining in place, say that a proposition *and* a prescription (for example, the two premises of a mixed-premise argument) merit endorsement *jointly* exactly if some fact sustains *both* the proposition and the prescription, and that they merit endorsement *separately* exactly if some fact sustains the proposition and some (maybe *different*) fact sustains the prescription. (To see how a fact can sustain *both* a proposition and a prescription, consider: the fact that you lied and you promised to apologize guarantees the proposition that you lied and normally supports the prescription “apologize”.) Clearly, meriting endorsement jointly entails meriting endorsement separately. But not vice versa: possibly, the proposition that you have sworn to tell the truth and the prescription “lie” do not merit endorsement jointly (because no fact which guarantees that you have sworn to tell the truth is a reason for you to lie) but do merit endorsement separately (because you have sworn to tell the truth but some fact—which does *not* guarantee that you have sworn to tell the truth; e.g., the fact that by lying you would avoid punishment—is a reason for you to lie). Now one can distinguish two ways of understanding D2:

(D2J) An argument is valid only if, necessarily, if its premises merit endorsement *jointly*, then its conclusion merits endorsement.

(D2S) An argument is valid only if, necessarily, if its premises merit endorsement *separately*, then its conclusion merits endorsement.

(D2S entails D2J, given that meriting endorsement jointly entails meriting endorsement separately.) I understand D2 as D2J. To see why, consider the following three arguments:

<u>Argument 1</u>	<u>Argument 2</u>	<u>Argument 3</u>
You did not tell the truth.	Don't tell the truth.	Don't tell the truth.
You told the truth.	Tell the truth.	The fact that you have sworn to tell the truth
So: You smiled.	So: You smiled.	is a conclusive reason for you to tell the truth.
		So: You smiled.

All three arguments may appear invalid. But Argument 1 is valid on the standard definition of validity for pure declarative arguments: its premises are inconsistent. It is reasonable to look for a definition of argument validity that yields as a special case the standard definition of validity for pure declarative arguments. This makes it reasonable (though not inevitable) to look for a definition of argument validity on which *any* argument with inconsistent premises is (trivially) valid: not only arguments with inconsistent *declarative* premises, like Argument 1, but also arguments with inconsistent *imperative* premises, like Argument 2, and—I submit—arguments with inconsistent *mixed* premises, like Argument 3. The claim that the premises of Argument 3 are inconsistent will be defended later on (by arguing that it is impossible for those premises to merit endorsement jointly and that this impossibility amounts to inconsistency; see note 41), but for the moment let me appeal to the intuition (which will be vindicated in §3) that the declarative premise of Argument 3 entails “tell the truth”—which is inconsistent with the imperative premise, namely “don't tell the truth”. But if Argument 3 is valid (because its premises are inconsistent), then D2S is false: it is possible that the conclusion of Argument 3 does not merit endorsement but the premises merit endorsement separately (though not jointly, as I said), because it is possible that you did not smile but there is both a conclusive reason for you to tell the truth—namely the fact that you have sworn to do so—and a non-conclusive reason for you not to tell the truth. This is why I understand D2 as D2J. I grant that one might reasonably disagree with the above train of thought, but I am in the process of providing a *motivation* for—not yet a full defense of—my general definition of argument validity.

### 2.2.3. Meriting *pro tanto* versus all-things-considered endorsement

I said that an imperative argument is fully successful only if its conclusion is supported by *reasons*, and in §2.2.2 I (tacitly) understood the claim that a prescription is supported by reasons as the claim that the prescription is supported by *some* reason, namely that it merits *pro tanto* (i.e., *prima facie*) endorsement. But one might argue that being supported by *some* reason does not amount to much; for example, convincing you that there is *some* reason for you to smother a crying baby with a pillow (e.g., the fact that this would eliminate the annoyance of the baby's cries) is by no means enough to convince you to smother the baby with a pillow. The point is that (the support provided by) a reason may be very weak, and may be defeated by other reasons. (If a fact supports a prescription, say that another fact *defeats*—i.e., is a *defeater* of—this support exactly if the *conjunction* of the two facts—understood as the fact that exists at all and only those possible worlds at which the two facts both exist<sup>9</sup>—does not support the prescription; cf. Pollock 1970: 73, 1974: 41-2, 1987: 484.) So one might argue that an imperative argument is fully successful only if its conclusion merits *all-things-considered* endorsement, namely the conclusion is *undefeatedly* supported by some fact (or reason): there is a fact whose conjunction with any fact supports the conclusion (equivalently: some fact supports the conclusion, and no fact defeats this support).<sup>10</sup> (My talk of “conclusive” reasons in §2.2.2 can be made precise now: say that a fact *conclusively*—or *indefeasibly*—supports a prescription exactly if, necessarily, if the fact exists then it *undefeatedly* supports the prescription.) To have a uniform terminology for propositions and prescriptions, say that a proposition merits *pro tanto* endorsement exactly if it is guaranteed by some fact, and that a proposition merits *all-things-considered* endorsement exactly if it is *undefeatedly* guaranteed by some fact: there is a fact whose conjunction with any fact guarantees the proposition. But for propositions this is a distinction without a difference: a fact guarantees a

---

<sup>9</sup> For the sake of simplicity, I assume that no distinct facts exist at exactly the same possible worlds (i.e., no distinct facts *f* and *f'* are such that, for every possible world *w*, *f* exists at *w* exactly if *f'* exists at *w*). This “modal criterion for the identity of facts” is accepted by several but not all theories of facts (Mulligan & Correia 2007/2009), but for my purposes the assumption is innocuous: if distinct facts existed at exactly the same possible worlds (e.g., the fact that Socrates is human and the fact that Socrates is human and every number is a number), they would sustain the same—or necessarily equivalent—propositions and prescriptions.

<sup>10</sup> Rather than saying that (1) a prescription merits all-things-considered endorsement exactly if it is *undefeatedly* supported by some fact, one might say that (2) a prescription merits all-things-considered endorsement exactly if it is supported by the *balance of reasons*, understood as the conjunction of all facts that are reasons (Vranas 2011: 374-5). *If all defeaters are reasons*, then (1) and (2) are equivalent: (a) if a prescription is *undefeatedly* supported by some fact, then it is supported by the balance of reasons (because the conjunction of the balance of reasons with a fact that *undefeatedly* supports a prescription and thus is a reason (i) just is the balance of reasons and (ii) supports the prescription), and (b) conversely, if a prescription is supported by the balance of reasons *and all defeaters are reasons*, then the prescription is *undefeatedly* supported by some fact, namely by the balance of reasons (because if by hypothesis the balance of reasons supports a prescription but one assumes for *reductio* that the conjunction of the balance of reasons with some fact does not support the prescription, then that fact is a defeater and thus a reason if all defeaters are reasons, and then the above conjunction is just the balance of reasons and by hypothesis supports the prescription, and the *reductio* is complete). But *if some defeaters are not reasons*, then the support provided by the balance of reasons to a prescription may be defeated, and in such a case it seems inappropriate to say that the prescription merits all-things-considered endorsement; so I prefer (1) to (2). One can also show that, regardless of whether all defeaters are reasons, (1) is equivalent to the claim that (3) a prescription merits all-things-considered endorsement exactly if it is *undefeatedly* supported by the balance of reasons, and (1) is also equivalent to the claim that (4) a prescription merits all-things-considered endorsement *exactly if it is supported by the conjunction of all facts*.



proposition exactly if it undefeatedly guarantees the proposition. Now one can distinguish two ways of understanding D2J:

(D2JP) An argument is valid only if, necessarily, if its premises merit *pro tanto* endorsement jointly, then its conclusion merits *pro tanto* endorsement. Equivalently: an argument is valid only if, necessarily, if some fact sustains every premise of the argument, then some fact sustains the conclusion of the argument.

(D2JA) An argument is valid only if, necessarily, if its premises merit *all-things-considered* endorsement jointly, then its conclusion merits *all-things-considered* endorsement. Equivalently: an argument is valid only if, necessarily, if some fact *undefeatedly* sustains (i.e., its conjunction with any fact sustains) every premise of the argument, then some fact *undefeatedly* sustains the conclusion of the argument.<sup>11</sup>

In §2.2.2 I understood D2J as D2JP, but the above considerations suggest that it is also desirable for a definition of argument validity to have D2JA as a consequence.<sup>12</sup> In fact, the definition of argument validity I am about to propose has *both* D2JP and D2JA as consequences.

### 2.3. The General Definition

Here is the fundamental idea of this paper:

GENERAL DEFINITION OF ARGUMENT VALIDITY. An argument is (deductively) *valid*—i.e., its premises *entail* its conclusion; equivalently, its conclusion *follows* from its premises—exactly if, necessarily, every fact that sustains every premise of the argument also sustains the conclusion of the argument.<sup>13</sup>

---

<sup>11</sup> Interestingly, the “all-things-considered” understandings of D2S and of D2J are equivalent. Indeed, a proposition and a prescription merit all-things-considered endorsement separately exactly if they merit all-things-considered endorsement jointly: if some fact *f* undefeatedly sustains a proposition and some fact *g* undefeatedly sustains a prescription, then some fact (e.g., the conjunction of *f* with *g*) undefeatedly sustains both the proposition and the prescription (mainly because the conjunction of any fact with the conjunction of *f* with *g* is the conjunction of *g* with some fact and thus sustains the prescription), and—trivially—vice versa.

<sup>12</sup> One might argue that D2JP (in contrast to D2JA) is not in any interesting sense a desirable consequence of a definition of argument validity because D2JP is almost trivial: at almost every possible world, almost every prescription is supported by *some* reason—for example, by the fact that someone somewhere prefers the satisfaction over the violation proposition of the prescription. In reply, I grant that almost every prescription is *possibly* supported by some reason (see Vranas 2011: 433-4), but the above reasoning does not show that almost every prescription is *actually* supported: it is probable that no reason actually supports the prescription “mutilate yourself” (because, among other things, no one happens to prefer the satisfaction over the violation proposition of the prescription), and indefinitely many further examples could be adduced. Moreover, here is a way to see that D2JP is indeed a desirable consequence: if, on a given definition of argument validity, the property of meriting *pro tanto* endorsement were not transmitted from the premises to the conclusion of a valid argument, then adducing (for example) a recognizably valid pure imperative argument and strong reasons supporting its premise would not be enough to convince rational people that *any* reason supported its conclusion—an unpalatable result. Note finally that it will not do to drop D2JP and say that transmission of meriting all-things-considered endorsement is both necessary *and sufficient* for an argument to be valid: as I argue in §4 (see Argument 14), it is not sufficient.

<sup>13</sup> The fact that at 7am Adam promises to cook dinner for Eve can support at 8am but not at 6am the prescription “Adam, cook dinner for Eve” (since at 8am the promise has been made but at 6am the promise has not yet been made), so a fact can support (i.e., sustain) a prescription at one time but not at another. Similarly, the above fact can be a reason for Adam but not a reason for Eve (since it is Adam, not Eve, who promises), so a fact can support a prescription relative to one agent but not to another (cf. Horty 2012: 41). Moreover, the above fact can be a moral but not a legal reason (usually, promises to cook dinner are morally but not legally binding), so different kinds of support (moral, legal, prudential, epistemic, etc.) can be distinguished. To deal with these complications (which I ignore in the text), distinguish (1) *relativized* from (2) *quantified* validity: (1) an argument is valid *relative* to a time

(Strictly speaking, this definition applies only to two-premise mixed-premise arguments, and to single-premise pure and cross-species arguments; to get a complete definition, add D1 (§2.1) for mixed-premise arguments, and similar claims for pure and cross-species arguments.)

In support of the General Definition, I will argue that (1) it has both D2JP and D2JA as consequences, and (2) it yields as special cases both the standard definition of validity for pure declarative arguments and a definition of validity for pure imperative arguments that I have defended elsewhere.

(1) To see that the General Definition has both D2JP and D2JA as consequences, take any valid argument. (a) Necessarily, if some fact sustains every premise of the argument, then—by the General Definition—that fact (and thus some fact) sustains the conclusion of the argument; so D2JP holds. (b) Necessarily, if some fact undefeatedly sustains every premise of the argument, then the conjunction of that fact with any fact sustains every premise and thus—by the General Definition—sustains the conclusion of the argument, and then that fact (and thus some fact) undefeatedly sustains the conclusion; so D2JA holds.<sup>14</sup>

(2) Given that to sustain a proposition is to guarantee it and to sustain a prescription is to support it (see Table 2), the General Definition yields as special cases the following definitions:

DEFINITION 1. A *pure declarative* argument is valid exactly if, necessarily, every fact that guarantees the premise of the argument also guarantees the conclusion of the argument.

DEFINITION 2. A *pure imperative* argument is valid exactly if, necessarily, every fact that supports the premise of the argument also supports the conclusion of the argument.

(a) The standard definition of validity for (single-premise) pure declarative arguments says that a pure declarative argument is valid exactly if, necessarily, if its premise is true, then its conclusion is also true. To see that this definition is equivalent to Definition 1, take any argument. Suppose that, (i) necessarily, every fact that guarantees the premise of the argument also guarantees the conclusion. Then, necessarily, if the premise is true, then the fact that the premise is true guarantees the premise and thus—by (i)—also guarantees the conclusion, so the conclusion is true. Conversely, suppose that, (ii) necessarily, if the premise is true, then the conclusion is also true. Then, necessarily, if a given fact guarantees the premise, then, necessarily, if the fact exists then the premise and thus—by (ii)—also the conclusion is true, so the fact also guarantees the

---

*t*, an agent *j*, and a kind of support *k* exactly if, necessarily, every fact that *k*-sustains at *t* relative to *j* every premise of the argument also *k*-sustains at *t* relative to *j* the conclusion of the argument, and (2) an argument is *valid* exactly if it is valid relative to *all* possible times, agents, and kinds of support. (I do not think that *atemporal* support exists. If *impersonal* support—which takes the perspectives of all agents into account—exists, include it in the range of the relevant quantifier by saying that it corresponds to a dummy agent *j*\*. Similarly, if *all-inclusive* support—which takes all specific perspectives (moral, legal, etc.) into account—exists, include it in the range of the relevant quantifier by saying that it corresponds to a dummy kind of support *k*\*.) Similar remarks apply if support is relative to a norm of rationality (Pigden 2012: 29-31). Relativized validity may appear strange, but in note 19 I argue that in certain cases it is more useful than quantified validity.

<sup>14</sup> It can also be shown that, if the accessibility relation between possible worlds is transitive, then the General Definition has as a further consequence what one gets by replacing “*undefeatedly*” with “*indefeasibly*” (and dropping the parenthetical remark) in my second formulation of D2JA in §2.2.3, so the property of being indefeasibly sustained—just like the properties of being sustained and of being undefeatedly sustained—by some fact is transmitted from the premises to the conclusion of a valid argument.

conclusion.<sup>15</sup> (b) The definition of validity for (single-premise) pure imperative arguments that I have extensively defended elsewhere (Vranas 2011) says that a pure imperative argument is valid exactly if, necessarily, every *reason* that supports the premise of the argument also supports the conclusion of the argument. It is easy to see that this definition is equivalent to Definition 2, by recalling that every reason is a fact and every fact that supports a prescription is a reason.

Given the above results, the General Definition looks quite promising. But is the definition *usable*? In other words, can one use the definition to decide whether specific arguments—for example, the argument from “repent” to “you can repent”—are valid? In the next four sections, I address this question for cross-species imperative arguments (§3), cross-species declarative arguments (§4), mixed-premise declarative arguments (§5), and mixed-premise imperative arguments (§6). In the process of doing so, I also provide further support for the General Definition, by arguing that it yields intuitively acceptable results concerning the validity of specific arguments.

### **3. Cross-species imperative arguments**

Recall that a cross-species imperative argument is an argument whose premise is a proposition and whose conclusion is a prescription (see Table 1); for example, the argument from “you must repent” to “repent”. Given that to sustain a proposition is to guarantee it and to sustain a prescription is to support it (see Table 2), the General Definition yields as a special case:

**DEFINITION 3.** A *cross-species imperative* argument is valid exactly if, necessarily, every fact that guarantees the (declarative) premise of the argument supports the (imperative) conclusion of the argument.

Say that an argument *A* is *equivalent* to an argument *A'* as a shorthand for saying that the claim that argument *A* is valid is equivalent to the claim that argument *A'* is valid. Definition 3 is rendered usable by the following theorem:

**EQUIVALENCE THEOREM 1.** (1) The *cross-species imperative* argument from the proposition *P* to the prescription *I'* is equivalent to the *pure declarative* argument from *P* to the proposition that some fact whose existence follows from *P* undefeatedly supports *I'*. (2) Equivalently, *P* entails *I'* exactly if *P* entails that the fact that *P* is true undefeatedly supports *I'*.

**PROOF.** (a) Suppose that, necessarily, every fact that guarantees *P* supports *I'*. Then, necessarily, if *P* is true, then the fact—call it  $f_P$ —that *P* is true (and thus some fact whose existence follows from *P*) undefeatedly supports *I'*: the conjunction of  $f_P$  with any fact supports *I'* because it guarantees *P* (since, necessarily, if the conjunction exists then  $f_P$  exists and thus *P* is true). (b) Conversely, suppose that, necessarily, if *P* is true, then some fact *f* whose existence follows from *P* (for example, the fact that *P* is true) undefeatedly supports *I'*. Then, necessarily, if a given fact *g* guarantees *P*, then *g* supports *I'* because (i) the conjunction of *f* with *g* supports *I'* (since *f* undefeatedly supports *I'*) but (ii) this conjunction is just *g* (since, necessarily, *g* exists exactly if *f* and *g* both exist; this is so because, necessarily, if *g* exists then *P* is true and thus *f* exists).

---

<sup>15</sup> The above informal proof of the equivalence between the standard definition and Definition 1 can be formalized, and is then seen to rely on the assumptions that (1) the accessibility relation between possible worlds is reflexive and transitive and (2) necessarily, if a proposition is true, then it is guaranteed by some fact (e.g., the fact that the proposition is true). By using the same assumptions, one can show that Definition 1 is also equivalent to: a pure declarative argument is valid exactly if, necessarily, if *some* fact guarantees the premise of the argument, then *some* fact guarantees the conclusion of the argument.

A first consequence of the theorem (or directly of Definition 3) is that, as expected (see §2.2.2), an *impossible* proposition entails *any* prescription. A second—and more interesting—consequence of the theorem is that (as one can show), for any *f*, the argument from the proposition that *f* is a fact which undefeatedly supports *I'* to the prescription *I'* is valid. For example, the following argument is valid:

Argument 4

The fact that you have sworn to tell the truth is an undefeated reason for you to tell the truth (i.e., undefeatedly supports “tell the truth”).

So: Tell the truth.

Indeed, according to the theorem, the validity of Argument 4 is equivalent to the validity of the pure declarative argument from the premise *P* of Argument 4 to the proposition that some fact whose existence follows from *P* undefeatedly supports “tell the truth”. But this pure declarative argument is valid: necessarily, if *P* is true, then some fact whose existence follows from *P*, namely the fact that you have sworn to tell the truth, undefeatedly supports “tell the truth”. By the way, I can now vindicate an intuition to which I appealed in §2.2.2, namely the intuition that the proposition *P\** that the fact that you have sworn to tell the truth is a *conclusive* reason for you to tell the truth entails “tell the truth”: since *P\** entails *P* and *P* entails “tell the truth”, *P\** entails “tell the truth” (by the transitivity of entailment, which follows from the General Definition).

A third consequence of the theorem is that a *necessary* condition for a cross-species imperative argument to be valid is that its premise entail that its conclusion is undefeatedly supported by some fact. For example, the following three arguments violate this necessary condition and thus are not valid:

Argument 5

You will tell the truth.

So: Tell the truth.

Argument 6

The fact that you have sworn to tell the truth is a reason for you to tell the truth.

So: Tell the truth.

Argument 7

There is a reason for you to tell the truth.

So: Tell the truth.

Indeed, the premise of Argument 5 does not entail that there is *any* reason for you to tell the truth, and the premise of Argument 6 (similarly for Argument 7) does not entail that there is an *undefeated* reason for you to tell the truth: possibly, the fact that you have sworn to tell the truth is a reason for you to tell the truth, but this reason—and every other reason there is for you to tell the truth—is defeated by some fact.<sup>16</sup> It is widely accepted in the literature that arguments like Argument 5 are not valid.<sup>17</sup> To see that the result that Argument 7 (similarly for Argument 6) is not valid is intuitively acceptable, compare Argument 7 with the following argument:

<sup>16</sup> Similarly, the argument form “the bottle contains petrol” to “believe that the bottle contains petrol” is not valid. Indeed, the proposition that the bottle contains petrol does not entail that there is an *undefeated* reason for you to believe that the bottle contains petrol: even if that proposition entails that there is an objective epistemic reason for you to believe that the bottle contains petrol (see note 4) and that reason cannot be defeated by any *epistemic* reason, that reason can still be defeated by a *non-epistemic* reason (for example, by the fact that your daughter’s life will be saved exactly if you do *not* believe that the bottle contains petrol; cf. Vranas 2011: 410).

<sup>17</sup> See: Bergström 1962: 41; Castañeda 1975: 122; Chaturvedi 1980: 477; Clarke 1975: 418, 1985: 102-3; Hare 1977: 468; Lemmon 1965: 55-6; MacKay 1971: 94; Sosa 1964: 69, 1967: 60; cf.: Ross 1941: 61, 1941/1944: 37-8; Stalley 1972: 26. Contrast: Boisvert & Ludwig 2006: 882; Katz 1977: 235 n. 58, 241.

### Argument 8

There is a *defeated* reason for you to tell the truth, and  
there is an undefeated reason for you *not* to tell the truth.

So: Tell the truth.

The premise of Argument 8 entails the premise of Argument 7, and the two arguments have the same conclusion. Therefore, if Argument 7 is valid, Argument 8 is also valid (by the transitivity of entailment). Since this relation between the two arguments is intuitively clear, if Argument 8 is intuitively not valid, then Argument 7 is intuitively not valid either. But Argument 8 is intuitively not valid. So Argument 7 is intuitively not valid either. (This is a claim about *tutored* intuitions; I am not denying that some people may have the *raw*—i.e., *untutored*—intuition that Argument 7 is valid.) Now compare Argument 7 with the following argument:

### Argument 9

There is an undefeated reason for you to tell the truth.

So: Tell the truth.

Given that (as I said), for any  $f$ , the argument from the proposition that  $f$  is a fact which undefeatedly supports  $I'$  to the prescription  $I'$  is valid, it is natural to expect the argument from the proposition that there is a fact which undefeatedly supports  $I'$  to the prescription  $I'$  to be valid, and thus it is natural to expect Argument 9 to be valid (although Argument 7 is not; cf. Castañeda 1975: 258, 304). (Compare: Argument 4 is valid although Argument 6 is not.) Indeed, by the second part of the theorem, Argument 9 is valid: necessarily, the fact that there is an undefeated reason for you to tell the truth is an undefeated reason for you to tell the truth. I am assuming here that, necessarily, if it is a fact that some reason undefeatedly supports a given prescription, then that fact undefeatedly supports the prescription. (This is at bottom an assumption about the relation of favoring, like my previously made—see §2.2.1—assumption that favoring is asymmetric.) I find the assumption plausible; but it might be considered controversial,<sup>18</sup> so I do not rely on it in the rest of this paper. Let me just note that, if the assumption is true, then the previously mentioned *necessary* condition for a cross-species imperative argument to be valid is also *sufficient*: if  $P$  entails that some fact undefeatedly supports  $I'$  (which is what the condition amounts to) and the proposition that some fact undefeatedly supports  $I'$  entails  $I'$  (which is what the assumption amounts to), then  $P$  entails  $I'$  (by the transitivity of entailment). Therefore, if the assumption is true,  $P$  entails  $I'$  exactly if  $P$  entails that some fact undefeatedly supports  $I'$ .<sup>19</sup>

---

<sup>18</sup> One might claim that the assumption leads to an infinite regress: it has the consequence that, if a fact  $f_0$  undefeatedly supports a prescription  $I$ , then the fact  $f_1$  that  $f_0$  undefeatedly supports  $I$  also undefeatedly supports  $I$ , and the fact  $f_2$  that  $f_1$  undefeatedly supports  $I$  also undefeatedly supports  $I$ , and so on. I reply that I do not consider the regress vicious: if  $f_0$  undefeatedly supports  $I$ , then (by the definition of undefeated support in §2.2.3) the conjunction of  $f_0$  with any fact undefeatedly supports  $I$ , so in general infinitely many facts undefeatedly support  $I$ .

<sup>19</sup> Recall that support is relative to *times* (see note 13; to simplify, ignore here the fact that support is also relative to agents, and also ignore the existence of different kinds of support). By adapting my proof of Equivalence Theorem 1, one can derive the following results for (1) relativized and (2) quantified validity (see note 13): (1)  $P$  entails  $I'$  relative to time  $t$  exactly if  $P$  entails that some fact whose existence follows from  $P$  undefeatedly supports  $I'$  at  $t$ , and (2)  $P$  entails  $I'$  exactly if  $P$  entails that some fact whose existence follows from  $P$  undefeatedly supports  $I'$  at *all* possible times. But then quantified validity is not very useful (at least for cross-species imperative arguments): if  $P$  entails (for example) “teach at 2pm”, then  $P$  is in general *false*, because  $P$  entails that some fact supports “teach at 2pm” even at times before you are born. To see that relativized validity is more useful, note that “teach at 2pm” is entailed relative to 8am by the proposition ( $P^*$ ) that the fact that at 8am you promise to teach at 2pm undefeatedly supports at 8am “teach at 2pm”. In contrast to  $P$ ,  $P^*$  is not in general false; if  $P^*$  is true, then “teach at 2pm” merits

It might be thought that the validity of (for example) Argument 4 refutes what Rescher (1966: 74) calls “Poincaré’s Principle”, namely the “rule” that Hare (1952: 30) attributes to Poincaré (1913: 225) and formulates as follows: “*No imperative conclusion can be validly drawn from a set of premisses which does not contain at least one imperative*” (Hare 1952: 28).<sup>20</sup> Although Hare defends this rule (1952: 32), strictly speaking he is not committed to the above formulation (1977: 468, 1979: 161 n. 1): he (at least implicitly) restricts the rule to *consistent* sets of premises—a restriction also adopted by Bergström (1962: 44), Espersen (1967: 99), Gensler (1990: 209), and Lemmon (1965: 69)—and to conclusions that are not what Hare calls “hypothetical” imperatives (1952: 32-8) and do not contain any logical connectives (1977: 468-9). (Argument 4 satisfies these conditions.) Hare also claims, however, that “‘ought’-sentences, at any rate in some of their uses, do entail imperatives” (1952: 164); for example, “I ought to do X”, used to make a “value-judgement”, entails “let me do X” (1952: 168-9). But this creates a puzzle: since “I ought to do X” is not imperative, doesn’t the claim that it entails “let me do X” contradict (even the restricted version of) Hare’s rule (i.e., Poincaré’s Principle)? No: Hare in effect notes the puzzle, and replies that there is no contradiction because “I ought to do X” is “evaluative” and not “equivalent to a series of indicative sentences” (1952: 171). This suggests that, strictly speaking, Hare endorses something like the following variant of Poincaré’s Principle: no imperative conclusion can be validly drawn from a consistent set of *non-evaluative* (more generally, *non-normative*) non-imperative premises.<sup>21</sup> This variant of Poincaré’s Principle need not be false if Argument 4 is valid: the premise of that argument is normative.

For another consequence of Equivalence Theorem 1, consider the following two arguments:

---

all-things-considered endorsement at 8am, and this is useful to know even if “teach at 2pm” does *not* merit endorsement later on (e.g., because at 9am you are released from your promise).

<sup>20</sup> Morscher (1972) points out that Poincaré (1913: 225) only talks about the *two* premises of a *syllogism*, but Weinberger (1976) replies that Poincaré’s reasoning shows that Hare is correct to attribute the rule formulated in the text to Poincaré. On possible objections to Poincaré’s Principle based on arguments similar to Argument 7 or Argument 9, see: Castañeda 1960a: 46, 1960b: 173-4, 1968: 39-42, 1975: 198-9; Hamblin 1987: 90-2; Morscher 1974: 22-3; Popper 1945: 205; Prior 1949: 71 (contrast: Clarke 1973: 217; Hoche 1995: 341-2; Lemmon 1965: 68; MacIntyre 1965: 520). On rejections of the principle on other grounds, see: Geach 1958: 55-6 (cf. note 22; Clarke 1970: 100; Morscher & Zecha 1971: 209); Borchardt 1979: 202; Gibbons 1960: 209-10 (cf. also Bohnert 1945: 311; Zellner 1971: 21). On (at least tentative) endorsements of (versions of) the principle, see: Bergström 1962: 46-7; Castañeda 1963: 234; Dubislav 1937: 342; Frey 1957: 438, 465; Grue-Sørensen 1939: 195; Jørgensen 1938: 288, 1938/1969: 9; Lalande 1963: 136, 169; Lemmon 1965: 69; Moritz 1954: 79; Popper 1945: 53, 1948: 154; Weinberger 1972: 151.

<sup>21</sup> This suggestion coheres with Hare’s claim that the rule under consideration is the “basis” of Hume’s is/ought thesis—which can be formulated as the thesis that no normative conclusion follows from a consistent set of non-normative premises (Hare 1952: 29; cf. Castañeda 1960a: 49; Duncan-Jones 1952: 199; Moritz 1954: 79). An alternative attempt to solve the puzzle begins by noting (following Mavrodes 1968: 356-8; cf. Bergström 1962: 43) that saying that a set of premises “does not contain at least one imperative” can be understood either as claiming that (1) no premise is an imperative or as claiming that (2) no premise is an imperative *and* the set of premises does not *implicitly* contain an imperative. On the former understanding, which is common in the literature, one gets a version of Poincaré’s Principle which is indeed false if Argument 4 or the argument from “I ought to do X” to “let me do X” is valid. On the latter understanding, however, one can get a version of Poincaré’s Principle which need not be false if the above two arguments are valid: arguably, the premise of Argument 4 (similarly for “I ought to do X”) implicitly contains an imperative. But if it implicitly contains an imperative because, as Mavrodes suggests, saying that a set of premises “does not *implicitly* contain at least one imperative” means “does not validly entail at least one imperative”, then the corresponding version of Poincaré’s Principle is “completely trivial” (1968: 357).

#### Argument 10

Antarctica is the coldest continent.

So: Either go to Antarctica  
or don't go to Antarctica.

#### Argument 11

Antarctica is the coldest continent.

So: Either go to Antarctica  
or don't go to the coldest continent.

To refute Poincaré's Principle, Geach (1958: 55-6) argues that (a variant of) Argument 11 is valid.<sup>22</sup> (Following Geach, note that the conclusion of Argument 11—unlike the conclusion of Argument 10—is not “vacuous”: it is not *necessarily* satisfied, because it is violated for example at some possible world at which the coldest continent is Europe rather than Antarctica and you go to Europe.) According to Equivalence Theorem 1, however, neither Argument 10 nor Argument 11 is valid: both arguments violate the previously mentioned necessary condition for a cross-species imperative argument to be valid, namely the condition that the premise of the argument entail that the conclusion is undefeatedly supported by some fact. Indeed, the proposition that Antarctica is the coldest continent does not entail that any fact supports any prescription (because it is possible that Antarctica is the coldest continent but no fact is a reason), and thus does not entail that any fact undefeatedly supports the conclusion of Argument 10 (similarly for Argument 11).

One might claim that Argument 10 is valid because “either go to Antarctica or don't go to Antarctica” is analogous to a declarative tautology and thus follows from any premises (cf. Lemmon 1965: 57), just as “go to Antarctica and don't go to Antarctica” is analogous to a declarative contradiction and thus entails any conclusion. In reply, note first that the prescription “go to Antarctica and don't go to Antarctica” is analogous to a declarative contradiction (which is necessarily false) not only in the sense that it is *necessarily violated*, but also in the sense that (as it is plausible to assume; see Vranas 2011: 433-4), *necessarily, no fact supports it* (which yields, by the General Definition, the result that this prescription entails any conclusion). By contrast, the prescription “either go to Antarctica or don't go to Antarctica” is analogous to a declarative tautology (which is necessarily true) in the sense that it is *necessarily satisfied* but *not* in the sense that, *necessarily, every fact supports it* (which *would* yield, by the General Definition, the result that this prescription follows from any premises): the claim that, necessarily, every fact supports a given prescription is false because it entails that, necessarily, every fact is a reason. Some people might defend the weaker claim (which I reject; cf. Vranas 2011: 406-7) that, necessarily, every *reason* (i.e., every fact which is a reason) supports “either go to Antarctica or don't go to Antarctica”; but this weaker claim poses no problem for the reasoning in the previous paragraph to the effect that Argument 10 is not valid. Note finally that, for the sake of having a unified account of validity, one has reason to accept the verdicts of the General Definition on practically useless arguments like Argument 10 if the verdicts of the definition on more useful arguments are intuitively acceptable.

### **4. Cross-species declarative arguments**

Recall that a cross-species declarative argument is an argument whose premise is a prescription and whose conclusion is a proposition (see Table 1); for example, the argument from “repent” to

---

<sup>22</sup> To defend the validity of (a variant of) Argument 11, Geach uses certain “rule[s] whereby, given one valid inference, we may derive another” (1958: 52); for example, “p, q, *ergo* r // p; *ergo*, either not q or r” (1958: 55). Castañeda replies that “Geach nowhere establishes that [these rules] also apply to imperatives” (1958: 45). For further discussion of Geach, see: Bergström 1962: 45-6, 1970: 423-4; Borowski 1977: 458-60; Espersen 1967: 99-100; Lemmon 1965: 56 (cf. Sosa 1966); Parsons 2013: 68; Stalley 1972: 24-5.

“you can repent”. Given that to sustain a proposition is to guarantee it and to sustain a prescription is to support it (see Table 2), the General Definition yields as a special case:

DEFINITION 4. A *cross-species declarative* argument is valid exactly if, necessarily, every fact that supports the (imperative) premise of the argument guarantees the (declarative) conclusion of the argument.

This definition is rendered usable by the following theorem:

EQUIVALENCE THEOREM 2. The *cross-species declarative* argument from the prescription  $I$  to the proposition  $P'$  is equivalent to the *pure declarative* argument from the proposition that some fact  $f$  is such that possibly  $f$  supports  $I$  to the proposition  $P'$ . (In other words:  $P'$  follows from  $I$  exactly if  $P'$  follows from the proposition that there is a fact which possibly—i.e., at some possible world—supports  $I$ .)

PROOF. (a) Suppose that, necessarily (i.e., at every<sup>23</sup> possible world), every fact that supports  $I$  guarantees  $P'$ . Take any possible world  $w$  at which some fact  $f$  possibly supports  $I$ . Then, at some possible world  $w'$ ,  $f$  supports  $I$  and thus—by the supposition—guarantees  $P'$ ; i.e., at  $w'$ —and thus also at  $w$ —it is necessary that, if  $f$  exists, then  $P'$  is true. Since  $f$  exists at  $w$ ,  $P'$  is true at  $w$ . (b) Conversely, suppose that, necessarily, if some fact possibly supports  $I$ , then  $P'$  is true. Take any possible world  $w$ . If a fact  $f$  supports  $I$  at  $w$ , then  $f$  guarantees  $P'$  at  $w$  because, necessarily, if  $f$  exists, then  $f$  (and thus some fact) possibly supports  $I$  (since  $f$  supports  $I$  at  $w$ ) and thus—by the supposition— $P'$  is true.

A first consequence of the theorem (or directly of Definition 4) is that a *necessary* proposition follows from *any* prescription. A second consequence of the theorem is that the following argument is valid:

Argument 12

Marry me.

So: Possibly, there is a reason for you to marry me  
(i.e., possibly, some fact supports “marry me”).

Indeed, the proposition that some fact possibly supports “marry me” entails that, possibly, something—i.e., some fact (see note 7)—supports “marry me”. The result that Argument 12 is valid is intuitively acceptable because either (1) the conclusion of Argument 12 is true, and then it is necessary (assuming that whatever is possible is necessarily possible) and thus it follows from *any* prescription (by the—intuitively acceptable—previous consequence of the theorem), or (2) the conclusion of Argument 12 is false, in other words it is necessary that no fact supports the prescription “marry me”, and then this prescription entails *any* proposition (see the last paragraph of §3).

A third consequence of the theorem is that neither of the following two arguments is valid:

---

<sup>23</sup> (1) For the sake of simplicity, in this informal proof I implicitly assume that the accessibility relation between possible worlds is universal; a formal proof can be given which assumes only that the accessibility relation is symmetric and transitive. (2) For (a) validity *relative* to a time  $t$  and (b) *quantified* validity (see note 13), replace in the theorem “supports  $I$ ” with (a) “supports  $I$  at  $t$ ” and with (b) “supports  $I$  at *some* possible time” respectively. (Remarks similar to (1) and (2) apply to Equivalence Theorem 3 in §5 and to its proof. By contrast, a formal proof of Equivalence Theorem 1 can be given which assumes only that the accessibility relation is reflexive.) (3) Because I assume that, necessarily, every fact exists (see note 7), it turns out that for the purposes of this paper it does not matter whether quantifiers are or not restricted to range only over existing objects; this is why in the formulation of the theorem I can switch between “some fact” and “there is a fact”.



Argument 13

Marry me.

So: You will marry me.

Argument 14

Marry me.

So: There is a reason for you to marry me.

Indeed, the proposition that some fact *possibly* supports “marry me” entails neither that you will marry me nor that some fact *supports* “marry me” (i.e., that there is a reason for you to marry me). Note that, necessarily, if the premise of Argument 14 merits pro tanto or all-things-considered endorsement (i.e., if some fact supports or undefeatedly supports “marry me”), then so does the conclusion (i.e., it is true). So the fact that Argument 14 is not valid shows that transmission of meriting pro tanto and of meriting all-things-considered endorsement from the premises to the conclusion of an argument is *not sufficient* for the argument to be valid (recall that it is *necessary*: see D2JP and D2JA in §2.2.3).

It is widely accepted in the literature that arguments like Argument 13 are not valid;<sup>24</sup> intuitively, there is no necessary connection between a prescription and the proposition that the prescription is satisfied (except in special cases: “either run or don’t run” does entail the necessary proposition that either you will run or you will not run). Similarly, I submit, the result that Argument 14 is not valid is intuitively acceptable (cf. Clark-Younger & Girard 2013) because, intuitively, there is no necessary connection between a prescription and the proposition that the prescription is supported by some fact (except in special cases). In response one might note that there *is* a necessary connection between a proposition *P* and the proposition that *P* is true, and might argue by analogy that (Argument 14 is valid because) there is also a necessary connection between a prescription *I* and the proposition that *I* is supported by some fact. I reply that, if the analogy works, then *I* and the proposition that *I* is supported by some fact entail each other (since *P* and the proposition that *P* is true entail each other), and then not only Argument 14 but also its *converse* argument (namely the argument from “there is a reason for you to marry me” to “marry me”) is valid. But the converse argument is *not* valid (see the discussion of Argument 7 in §3), so the analogy fails.<sup>25</sup>

A fourth consequence of the theorem is that the following argument is valid:

Argument 15

Marry me.

So: Some fact is possibly a reason for you to marry me.

Indeed, the proposition that some fact possibly supports “marry me” just is—and thus trivially entails—the conclusion of Argument 15. I find the result that Argument 15 is valid intuitively acceptable. But even if one disagrees, for the sake of having a unified account of validity one has

---

<sup>24</sup> See: Castañeda 1975: 122; Clarke 1975: 418, 1985: 102-3; Hansen 2008: 16; Pigden 2011: 5; Sosa 1964: 69, 1967: 60. Contrast: Harnish 2006: 68-9; Vanderveken 1990: 160.

<sup>25</sup> In response one might propose a different analogy, to the effect that there is a necessary connection between a prescription *I* and the proposition that *I* is *undefeatedly* supported by some fact. On this analogy, the argument from “marry me” to “there is an *undefeated* reason for you to marry me” is valid (and I cannot claim that its converse argument is not valid if I claim that Argument 9 is valid), and thus Argument 14 is also valid. I reply that this analogy also fails: although, necessarily, every fact that guarantees a proposition *P* also guarantees that *P* is true, it is *false* that, necessarily, every fact that supports (or even undefeatedly supports) a prescription *I* also guarantees that some fact undefeatedly supports *I*. Indeed: possibly (i.e., at some possible world *w*), the fact *f* that you have promised to run (1) undefeatedly supports (at *w*) “run” but (2) does not *guarantee* that some fact undefeatedly supports “run” because, *possibly* (i.e., at some possible world *w*), *f* exists but no fact undefeatedly supports (at *w*) “run”—e.g., because the fact that your leg is now broken also exists (at *w*’but not at *w*).

reason to accept the verdict of the General Definition (or Definition 4) on this argument if one agrees with me that the verdicts of the definition on the previous three arguments are intuitively acceptable.<sup>26</sup>

For further consequences of the theorem, consider the following three arguments:

Argument 16

Marry me.

So: It is possible for you to marry me.

Argument 17

Marry me.

So: Possibly, you can marry me.

Argument 18

Marry me.

So: You can marry me.

If it is true (as I implicitly assumed in the last paragraph of §3) that, *necessarily, a necessarily violated prescription*—like “go to Antarctica and don’t go to Antarctica”—*is necessarily not supported by any fact*,<sup>27</sup> then the conclusion of Argument 12 entails the conclusion of Argument 16: necessarily, if it is possible that some fact supports “marry me” (i.e., if the conclusion of Argument 12 is true), then—by the above assumption—the prescription “marry me” is not necessarily violated, so it is possible for you to marry me (i.e., the conclusion of Argument 16 is true).<sup>28</sup> But then, given that Argument 12 is valid, Argument 16 is also valid (by the transitivity of entailment, given that the two arguments have the same premise). Similarly, if it is true (as some people might assume; see Vranas 2007 for a defense of the assumption) that, *necessarily, there is a reason for you to marry me only if you can marry me*, the conclusion of Argument 12 entails the conclusion of Argument 17, and then Argument 17 is also valid. By contrast, Argument 18 is not valid (pace Rescher 1966: 94-5) because the proposition that some fact possibly supports “marry me” does not entail that you can marry me: possibly, you cannot marry me (because I am already married and neither polygamy nor remarriage is available) but some fact (namely the fact that we love each other) is *possibly* a reason for you to marry me (it *would* be such a reason if I were not already married).<sup>29</sup> My claim that “marry me” does not entail “you

<sup>26</sup> The conclusion of Argument 15 entails that some fact is possibly a reason, so another consequence of the theorem is that “marry me” entails that some fact is possibly a reason. Arguably, this consequence is intuitively acceptable because the proposition that some fact is possibly a reason is necessary (and thus follows from *any* prescription). Opponents of facts may well disagree, but recall that I can replace talk of facts with talk of true propositions (§2.2.2). Nihilists about reasons, who hold that it is impossible for reasons to exist, may also disagree, but clearly my project in this paper is not addressed to such nihilists (since my appeal to reasons is crucial to my account).

<sup>27</sup> If this assumption is true, then a consequence of Definition 4 is that *any* proposition follows from a necessarily violated prescription. For example, “you smiled” follows from “don’t tell the truth and tell the truth”, so Argument 2 (§2.2.2) is valid. One might claim that Argument 2 is not valid according to Definition 4 because it is possible that some fact (e.g., the fact that if you tell the truth your mother will die but if you do not tell the truth an innocent person will be imprisoned) supports *both* “don’t tell the truth” and “tell the truth” but does not guarantee “you smiled”. I reply that (1) this is not possible (given my assumption that favoring is asymmetric) and (2) even if it is possible, Argument 2 is still valid: on my account (see §2.1 and the paragraph right after the formulation of the General Definition in §2.3), Argument 2 is valid exactly if, necessarily, every fact that supports the *conjunction* of its premises (as opposed to supporting *every* premise) guarantees its conclusion—and this is so if, necessarily, no fact supports “don’t tell the truth and tell the truth”.

<sup>28</sup> A similar reasoning shows that the converse entailment (from the conclusion of Argument 16 to the conclusion of Argument 12) holds if the following plausible assumption (which is the converse of the above assumption) is true: necessarily, if it is necessary that no fact supports a given prescription, then the prescription is necessarily violated (see Vranas 2011: 433-4).

<sup>29</sup> (1) One can similarly show that the argument from “kiss him” to “I permit you to kiss him” is not valid. This result is intuitively acceptable because the premise of the argument, namely the *prescription* I express by using the imperative sentence “kiss him”, can also be expressed by someone else (using the same imperative sentence), and thus intuitively it does not entail that I grant you permission to kiss him. Admittedly, it would be strange for me to

can marry me” (i.e., that Argument 18 is not valid) is compatible with the claim that “there is an undefeated reason for you to marry me” entails both “marry me” (see Argument 9) and “you can marry me”.

The second assumption I stated in the previous paragraph (namely the assumption that, necessarily, there is a reason for you to marry me only if you can marry me) is controversial. Moreover, one might take the proposition that there is a reason for you to marry me only if you can marry me to be *conceptually* but not *logically* necessary, and thus one might take Argument 17 to be *conceptually* valid (like the argument from “this is a yellow shirt” to “this is a colored shirt”) but not *logically* valid (unlike the argument from “this is a yellow shirt” to “this is a shirt”). One might thus object to my project in this paper that it is not an investigation into *logical* validity and thus is not important for logic. I reply that this objection “proves too much”. A deontic logician may well assume (as an axiom) that whatever is obligatory is permissible, and an epistemic logician may well assume that whatever is known is true; these assumptions may be conceptually but not logically necessary, but it does not follow that the projects of these logicians are unimportant for logic.<sup>30</sup>

The validity of Argument 12 (and of Argument 15) refutes what Rescher (1966: 72-3) calls “Hare’s Thesis”, namely the “rule” that Hare formulates as follows: “*No indicative conclusion can be validly drawn from a set of premisses which cannot be validly drawn from the indicatives among them alone*” (Hare 1952: 28).<sup>31</sup> Hare’s Thesis is widely rejected in the literature, but the

---

say “kiss him, but I do not permit you to kiss him”, but this does not show that “kiss him” entails “I permit you to kiss him” (compare: it would be strange for me to say “it is raining, but I do not believe it is raining”, but this does not show that the proposition that it is raining entails the proposition that I believe it is raining; cf. Moore 1942: 543, 1944: 204, 1993). (2) Similarly, the argument from “kiss him” to “you are permitted (i.e., not forbidden) to kiss him” is not valid: possibly, some fact (e.g., the fact that he will be happy if you kiss him) supports “kiss him” but does not guarantee that you are permitted to kiss him. This result is intuitively acceptable because, if that argument is valid, then (given that adding declarative premisses preserves validity; see §6.2) the argument from “kiss him” and “you are *not* permitted to kiss him” to “you are permitted to kiss him” is also valid—but intuitively it is not. (The premisses of the latter argument are consistent; see note 43.) (3) One might argue that “kiss him” *presupposes* that you are permitted to kiss him, and similarly “marry me” *presupposes* that you can marry me, so it is a purely verbal issue whether the argument in (2) or Argument 18 is valid. I reply that the existence of large literatures on the validity of deontic analogs of these arguments (i.e., on whether obligatoriness entails permissibility, and on whether “ought” implies “can”) suggests that whether these arguments are valid is not a purely verbal issue.

<sup>30</sup> Following MacFarlane (2005/2009), distinguish “four general attitudes” towards logical validity. (1) *Demarcators* hold that “logicians who investigate the (non-formal) kind of ‘validity’ possessed by [arguments like ‘this is yellow; so this is colored’] are straying from the proper province of logic into some neighboring domain” (e.g., lexicography or metaphysics). (2) *Debunkers* hold that “logic is concerned with validity *simpliciter*, not just validity that holds in virtue of a limited set of ‘logical forms.’” (3) *Relativists* agree with Demarcators that “logical consequence must be understood as *formal* consequence”, but *relativize* “logical consequence to a choice of logical constants”. Finally, (4) *Deflaters* hold that logical validity is not a relative notion but “logical validity” is a “family resemblance” term, like “game”. I sympathize with Relativists: in the context of imperative logic, I take “fact” and “favor” to be logical constants, like “and” and “or” (cf. Warmbröd 1999: 534-6). But I do not need to insist on this; instead I want to note that Debunkers and Relativists need not deny that my project in this paper is important for logic, and that Demarcators and Deflaters who deny this (by using the reasoning of the above objection) seem committed to the unpalatable claim that typical projects of deontic and epistemic logicians are unimportant for logic (contrast Harman 1972: 81).

<sup>31</sup> More precisely, the claim that no declarative (i.e., indicative) conclusion can be validly drawn from only imperative premisses follows from Hare’s Thesis (which is then refuted by the validity of Argument 12) *if* (1) no imperative (premise) is *also* declarative (Gibbons 1960: 209) and (2) no declarative conclusion can be validly drawn from *no* premisses whatsoever (cf. MacKay 1969: 147). Rescher (1966: 73 n. 1) notes that Hare (1952:

two frequently discussed kinds of alleged counterexamples to it are very different from Argument 12 (and from Argument 15) and—as I will argue—do not succeed. First, some people (Castañeda 1960a: 48, 1963: 228-9, 1974: 130; Rescher 1966: 92-5) claim that arguments like the one from “marry Dan’s only daughter” to “Dan has only one daughter” are valid. But the sentence “marry Dan’s only daughter” can be understood in (at least) two ways, corresponding to the following two arguments:

Argument 19

Dan has only one daughter;  
 (let it be the case that you) marry her.  
 So: Dan has only one daughter.

Argument 20

Let it be the case that: Dan has only one daughter,  
 and you marry her.  
 So: Dan has only one daughter.

The intuition that Argument 19 is valid may be compelling (and I vindicate it below), but it should be intuitively clear that Argument 20 is not valid: intuitively, even if the premise of Argument 20 entails “*let it be the case that* Dan has only one daughter”, it does not entail “Dan has only one daughter”. Indeed, it is a consequence of Equivalence Theorem 2 that Argument 20 is not valid: the proposition that some fact is possibly a reason for Dan to have only one daughter and for you to marry her (i.e., that some fact possibly favors the proposition that Dan has only one daughter and you marry her over the negation of that proposition) does not entail that Dan has only one daughter. But what about Argument 19, which arguably corresponds to a more typical way of understanding the sentence “marry Dan’s only daughter”? Following Rescher (1966: 92; cf. Duncan-Jones 1952: 197), one might suggest that the composite sentence “Dan has only one daughter; marry her” expresses a “meshed composite” of a proposition and a prescription. But if this is understood as the suggestion that the composite sentence expresses an entity of a third kind, distinct both from propositions and from prescriptions, I reply that I do not see what such a kind of entity would be. (Moreover, let us not multiply kinds of entities beyond necessity.) I suggest instead that the composite sentence expresses *both* a proposition (namely the proposition that Dan has only one daughter) and a prescription (namely either (1) the premise of Argument 20 or, if the composite sentence expresses a prescription which is neither satisfied nor violated if Dan does not have only one daughter, (2) the prescription expressed by “if Dan has only one daughter, marry her”<sup>32</sup>). But then Argument 19 is a *mixed-premise* (rather than a *cross-*

---

34—implicitly—restricts the rule to premises that are not what Hare calls “hypothetical” imperatives. Bergström (1962: 47) and Espersen (1967: 101) argue that, to avoid trivial counterexamples, the rule should be restricted to *consistent* sets of premises and to *non-necessary* conclusions.

<sup>32</sup> Indeed, this prescription is satisfied exactly if Dan has only one daughter and you marry her, is violated exactly if Dan has only one daughter and you do not marry her, and is avoided exactly if Dan does not have only one daughter—and it is natural to say that these are precisely the satisfaction, violation, and avoidance conditions of the prescription expressed by the composite sentence “Dan has only one daughter; marry her” (although it is also natural to say, alternatively, that the composite sentence expresses a prescription—namely the premise of Argument 20—which is *violated* if Dan does not have only one daughter). This specification of the prescription expressed by the composite sentence avoids Castañeda’s (1963: 228-9) objection that “[‘marry her’] is not by itself a complete imperative, since it does not contain the referent of the pronoun [‘her’]”, and “cannot, therefore, be a premise”. Note the analogy between (1) the suggestion that “Dan has only one daughter; marry her” amounts to “Dan has only one daughter; if Dan has only one daughter, marry her” and (2) the equivalence between  $S \& T$  and  $S \& (S \rightarrow T)$ , where  $S$  and  $T$  are any declarative sentences. Note also that the sentence “marry Dan’s only daughter” can also be understood as expressing the prescription expressed by “*make* it the case that Dan has only one daughter and you marry her”; but this understanding is atypical (cf. Grice 1981/1989: 270), and in any case does not correspond to a valid or intuitively valid argument. Finally, one might propose understanding the sentence “marry Dan’s only daughter” as expressing either the prescription expressed by (a) “marry the  $x$  who is Dan’s only daughter” or the prescription

*species*) declarative argument (see Table 1); its conclusion is identical with—and thus trivially follows from—its declarative premise, so its validity (which is an immediate consequence of the General Definition) does not refute Hare’s Thesis.<sup>33</sup> I conclude that the first frequently discussed kind of alleged counterexample to Hare’s Thesis does not succeed.

The second frequently discussed kind of alleged—but, as I will argue, also unsuccessful—counterexample to Hare’s Thesis is exemplified by an argument proposed by Castañeda (1960a: 48-9, 1974: 130-1):<sup>34</sup>

#### Argument 21

If he comes, leave the files open.

Do not leave the files open.

So: He will not come [or: he does not come].

To defend his claim that Argument 21 is valid, Castañeda considers a scenario in which a boss first tells his secretary to leave the files open if a certain person comes to inspect them, but then, after speaking with someone on the phone, says to his secretary: “Well, Emily, don’t leave the files open, after all” (1960a: 49, 1974: 131). According to Lemmon, however, the secretary “may [not] *infer* that the other person will not come; rather surely she may *hope* that he will not come (because if he does then she certainly cannot obey her boss’s orders)—or she may conclude from her knowledge of her boss that he does not *think* the other person will come” (1965: 64). In reply, Espersen (1967: 97; cf. Harrison 1991: 111-2) grants that “he will not come” does not follow from the fact that the boss has issued the two orders, but notes that similarly “he will not come” does not follow from the fact that a given person has expressed the propositions “if he comes, the files will be open” and “the files will not be open” (although it does follow from the propositions themselves). I take Espersen’s point to be that to ask whether Argument 21 is valid is to ask whether “he will not come” follows from the *prescriptions* which are the premises of the argument, not whether it follows from the fact that a given person has *expressed* those pre-

---

expressed by (b) “let it be the case that you marry the *x* who is Dan’s only daughter”, where “the *x* who is Dan’s only daughter” corresponds to a *restricted* quantifier (cf. Pietroski 1999/2014). Concerning (a), I reply that, absent a theory of *imperative* restricted quantification, it is unclear what exactly (a) expresses. Concerning (b), I reply that, even if the prescription that (b) expresses entails “*let it be the case that* Dan has only one daughter”, it does not entail “Dan has only one daughter”.

<sup>33</sup> Consider also the argument from “marry me” to “you are not already married to me”. In contrast to the prescriptions typically expressed by “marry Dan’s only daughter” (understood as “marry *sooner or later* the person who *now* is Dan’s only daughter”), which cannot be satisfied if Dan does not (now) have only one daughter, the prescription typically expressed by “marry me” (understood as “marry me sooner or later”) can be satisfied even if you are already married to me: we can get a divorce and then get remarried. Once this is noticed, the illusion that the argument from “marry me” to “you are not already married to me” is valid (and thus refutes Hare’s Thesis) should vanish. Note that I do not need to take a stand on whether “marry me” *presupposes* that you are not already married to me (cf. Adler 1980: 105-7; Lemmon 1965: 57; Sosa 1964: 5; Warnock 1976: 294; Wedeking 1969: 38; see also Clarke 1975: 418). (Primarily to avoid unnecessary controversy, in this paper I rely on standard declarative logic; so I do not examine views on which, for example, “you will marry Dan’s only daughter” is neither true nor false if Dan does not have only one daughter. So I take it that “you will marry Dan’s only daughter” *entails* that Dan has only one daughter; otherwise, at some possible world, Dan does not have only one daughter but you marry Dan’s only daughter—which is absurd.)

<sup>34</sup> For similar examples, see: Geach 1958: 52; Pigden 2011: 3, 5-6; Rescher 1966: 96. For further endorsements of the view that such arguments are valid, see: Adler 1980: 102-3; Bergström 1962: 40, 47; Castañeda 1958: 45; Clarke 1970: 100; Gombay 1967: 150; Morscher & Zecha 1971: 209; Parsons 2013: 86-7; Sosa 1964: 88-9, 1970: 221.

scriptions (cf. Duncan-Jones 1952: 200). Appreciating this point, however, casts doubt on the relevance of Castañeda’s scenario: in that scenario the secretary may infer “he will not come” from the premise that the boss has issued the two orders together with the (implicit) premise that the boss would not do so if the other person were coming (cf. Duncan-Jones 1952: 200; Zellner 1971: 97-8), but how does the scenario show that the secretary may infer “he will not come” from the boss’s orders themselves?

To cast further doubt on the relevance of Castañeda’s scenario, consider a modified scenario in which the boss first tells his secretary *not* to leave the files open, but then, after speaking with someone on the phone, tells his secretary to leave the files open after all if a certain person comes to inspect them. Intuitively, in this modified scenario the secretary may *not* infer that the other person will not come. But whether an argument is valid cannot depend on the *order* in which its premises are uttered (except if one considers *dynamic* concepts of validity, which lie beyond the scope of this paper). Castañeda might respond that in the modified scenario it is natural to understand the boss’s second order as *canceling* the first; he specifies that his own scenario is not to be understood in this way (1960a: 48, 1974: 130-1; cf. Geach 1958: 52). Still, our intuitions are suspicious if they are influenced by the order in which the premises are uttered. To avoid such influences, and also for the reason I gave in §2.1, I propose to consider the *conjunction* of the premises of Argument 21. Here is the definition of imperative conjunction that I have defended elsewhere (Vranas 2008: 538-41):

DEFINITION 5. The *conjunction* of given prescriptions (the *conjuncts*) is the prescription whose context is the disjunction of the contexts of the conjuncts and whose violation proposition is the disjunction of the violation propositions of the conjuncts.

Using this definition, one can show that the conjunction of the premises of Argument 21 is the premise of the following argument,<sup>35</sup> so that Argument 21 is valid exactly if the following argument is (see D1 in §2.1):

Argument 22

Let it be the case that: he does not come, and you do not leave the files open.

So: He will not come [or: he does not come].

But it is a consequence of Equivalence Theorem 2 that Argument 22 is not valid (see the reasoning I gave for Argument 20), and indeed it should be intuitively clear that Argument 22 is not valid: intuitively, even if the premise of Argument 22 entails “*let it be the case that* he does not come”, it does not entail “he does not come”. I conclude that Hare’s Thesis is *not* refuted by any

---

<sup>35</sup> One might wonder why the conjunction of the *conditional* prescription ( $I_1$ ) “if he comes, leave the files open” with ( $I_2$ ) “do not leave the files open” is an *unconditional* prescription, namely the premise of Argument 22. To see intuitively why, note that  $I_2$  is (necessarily) equivalent to the conjunction of ( $I_3$ ) “if he comes, do not leave the files open” with ( $I_4$ ) “if he does not come, do not leave the files open”. But  $I_3$  &  $I_4$  is equivalent to  $I_3$  & ( $I_3$  &  $I_4$ ), so  $I_2$  is equivalent to  $I_3$  &  $I_2$ . Then  $I_1$  &  $I_2$  is equivalent to  $I_1$  & ( $I_3$  &  $I_2$ ), and thus to  $(I_1$  &  $I_3)$  &  $I_2$ . But  $I_1$  &  $I_3$  is equivalent to “if he comes, leave the files open and do not leave the files open”, so  $(I_1$  &  $I_3)$  &  $I_2$  (and thus  $I_1$  &  $I_2$ ) is equivalent to the conjunction of “let it be the case that he does not come” with  $I_2$ , and thus to the premise of Argument 22. (The above equivalences can be rigorously justified by using Definition 5, but here I am appealing to their intuitive plausibility. For the sake of simplicity, throughout this paper I assume that necessarily equivalent propositions are identical, and thus that so are necessarily equivalent prescriptions—i.e., prescriptions whose satisfaction propositions are necessarily equivalent and whose violation propositions are also necessarily equivalent. Dropping this simplifying assumption would not affect my main claims; for example, I would say that the conjunction of the premises of Argument 21 is *necessarily equivalent* to the premise of Argument 22, but this would not affect my main claim that Argument 21 is valid exactly if Argument 22 is.)

of the frequently discussed alleged counterexamples to it—although, as I said, it *is* refuted by the validity of Argument 12 (and of Argument 15).<sup>36</sup>

### **5. Mixed-premise declarative arguments**

Recall that a mixed-premise declarative argument is an argument whose premises are a prescription and a proposition and whose conclusion is a proposition (see Table 1); for example, the argument from “if you sinned, repent” and “you sinned” to “you will repent”. Given that to sustain a proposition is to guarantee it and to sustain a prescription is to support it (see Table 2), the General Definition yields as a special case:

**DEFINITION 6.** A *mixed-premise declarative* argument is valid exactly if, necessarily, every fact that both supports the imperative premise and guarantees the declarative premise of the argument guarantees the (declarative) conclusion of the argument.

The following theorem has a proof similar to my proof in §4 of Equivalence Theorem 2:

**EQUIVALENCE THEOREM 3.** (1) The *mixed-premise declarative* argument from the prescription *I* and the proposition *P* to the proposition *P'* is equivalent to the *pure declarative* argument from the proposition that some fact which guarantees *P* possibly supports *I* to the proposition *P'*. (2) Equivalently, *P'* follows from *I* and *P* exactly if *P'* follows from the proposition that there is a fact which possibly both guarantees *P* and supports *I*.<sup>37</sup>

Although this theorem is of interest, I do not use it in what follows; instead I use Definition 6 directly. Given the mixed-premise declarative argument from the prescription *I* and the proposition *P* to the proposition *P'*, say that its *pure subargument* is the argument from *P* to *P'*, and say that its *cross-species subargument* is the argument from *I* to *P'*. A first consequence of Definition 6 (in conjunction with Definition 1 and Definition 4) is that a mixed-premise declarative argument is valid if its pure subargument or its cross-species subargument is valid. For example, the following two arguments are valid:

---

<sup>36</sup> One might argue that the validity of Argument 12 does not refute a version of Hare’s Thesis restricted to consistent sets of premises and to non-necessary conclusions (see the end of note 31): the conclusion of Argument 12 is true (it is definitely *possible* that there be a reason for you to marry me) and thus is necessary (assuming that whatever is possible is necessarily possible). More subtly, one might argue that the validity of Argument 12 does not refute the restricted version of Hare’s Thesis because Argument 12 either (1) has a necessary conclusion or (2) has an inconsistent premise: either (1) the conclusion of Argument 12 is true and thus necessary, or (2) the conclusion of Argument 12 is false, in other words it is necessary that no fact supports the prescription “marry me”, and then this prescription—which is the premise of Argument 12—is necessarily violated (given the assumption in note 28) and thus is inconsistent (given the definition of imperative inconsistency that I have defended elsewhere (Vranas 2008: 545-8): a set of prescriptions is *inconsistent* exactly if it is necessary that at least one of the prescriptions be violated). I reply that Argument 15 (as opposed to Argument 12) does not have a necessary conclusion, so the validity of Argument 15 refutes even the restricted version of Hare’s Thesis.

<sup>37</sup> **PROOF OF (1).** (a) Suppose that, necessarily (i.e., at every—see note 23—possible world), every fact that both supports *I* and guarantees *P* guarantees *P'*. Take any possible world *w* at which some fact *f* which guarantees *P* (so that, necessarily, if *f* exists, then *P* is true) possibly supports *I*. Then, at some possible world *w'*, *f* both (i) supports *I* (since *f* possibly supports *I* at *w*) and (ii) guarantees *P* (since, necessarily, if *f* exists, then *P* is true), and thus—by the supposition—*f* guarantees *P'*; i.e., necessarily, if *f* exists, then *P'* is true. Since *f* exists at *w*, *P'* is true at *w*. (b) Conversely, suppose that, necessarily, if some fact which guarantees *P* possibly supports *I*, then *P'* is true. Take any possible world *w*. If a fact *f* both supports *I* and guarantees *P* at *w*, then *f* guarantees *P'* at *w* because, necessarily, if *f* exists, then *f* (and thus some fact which guarantees *P*) possibly supports *I* (since *f* supports *I* at *w*) and thus—by the supposition—*P'* is true. (2) can be similarly proved.

Argument 23

Repent.  
Felicity and Letitia are nuns.  
So: Letitia is a nun.

Argument 24

Repent.  
Felicity and Letitia are nuns.  
So: Possibly, there is a reason for you to repent.

A second consequence of Definition 6 is that the following two arguments are valid:

Argument 25

Repent.  
If it is possible for you to repent,  
then you will repent.  
So: You will repent.

Argument 26

Either repent or undo the past.  
It is impossible for you to  
undo the past.  
So: It is possible for you to repent.

Indeed, necessarily, every fact that supports “repent” guarantees that it is possible for you to repent (see the discussion of Argument 16 in §4), so every fact that both supports “repent” and guarantees that you will repent if it is possible for you to repent guarantees both that (1) it is possible for you to repent and that (2) you will repent if it is possible for you to repent, and thus also guarantees that (3) you will repent—and Argument 25 is valid.<sup>38</sup> (Similarly for Argument 26.)

A third (and very useful) consequence of Definition 6 is that the mixed-premise declarative argument from *I* and *P* to *P'* is *not* valid if the following proposition is possible: some fact which supports *I* guarantees both *P* and the negation of *P'*. Indeed, if that proposition is possible, then it is possible that some fact which both supports *I* and guarantees *P* does *not* guarantee *P'* (since, necessarily, every fact that guarantees the negation of *P'* does *not* guarantee *P*), and then (by Definition 6) *I* and *P* do not jointly entail *P'*. For example, the following argument is not valid:

Argument 27

If you sinned, repent.  
You sinned.  
So: You will repent.

Indeed, it is possible that the fact that (1) you have promised that, if you sinned, you will repent but (2) you sinned and yet you will not repent—which, by (2), guarantees both that you sinned (namely *P*) and that you will not repent (namely the negation of *P'*)—supports, in virtue of (1), “if you sinned, repent” (namely *I*): there may be a reason for you to keep your promise even if you are going to break it. I trust that the result that Argument 27 is not valid is intuitively acceptable.

A fourth consequence of Definition 6 is that a mixed-premise declarative argument is valid if, necessarily, no fact both supports the imperative premise and guarantees the declarative premise of the argument. In other words, a mixed-premise declarative argument is valid if its premises are *inconsistent* as per the following definition:

---

<sup>38</sup> It might be thought that the validity of Argument 25 refutes the restricted version of Hare’s Thesis I examined in note 36. One might reply, however, that either (1) it is impossible for you to repent, and then the premises of Argument 25 are inconsistent (by Definition 7 below in the text and the assumption in note 28), or (2) it is possible for you to repent, and then the conclusion of Argument 25 follows from the declarative premise of that argument alone (because then it is necessarily possible for you to repent, so the antecedent of the declarative premise of Argument 25 is necessary, and then that premise is necessarily equivalent to its consequent, which is also the conclusion of Argument 25).



DEFINITION 7. A proposition and a prescription are (jointly) *inconsistent*—i.e., the proposition is inconsistent with the prescription; in other words, the prescription is inconsistent with the proposition—exactly if, necessarily, no fact both guarantees the proposition and supports the prescription (i.e., it is impossible for the proposition and the prescription to merit endorsement jointly; see §2.2.2), and are (jointly) *consistent* otherwise.<sup>39</sup>

Here are five (neither mutually exclusive nor collectively exhaustive) cases in which a proposition  $P$  and a prescription  $I$  are inconsistent. *Case 1:*  $P$  is impossible. In this case, necessarily, no fact guarantees  $P$ ; so, necessarily, no fact both guarantees  $P$  and supports  $I$ . *Case 2:*  $I$  is necessarily violated. In this case, necessarily, no fact supports  $I$  (given my standing assumption that, necessarily, a necessarily violated prescription is necessarily not supported by any fact<sup>40</sup>); so, necessarily, no fact both guarantees  $P$  and supports  $I$ . *Case 3:*  $I$  entails the negation of  $P$ . In this case, necessarily, every fact that supports  $I$  guarantees the negation of  $P$  and thus does not guarantee  $P$  (since, necessarily, every fact that guarantees the negation of  $P$  does not guarantee  $P$ ); so, necessarily, no fact both guarantees  $P$  and supports  $I$ . *Case 4:*  $P$  entails the *negation* of  $I$ , defined (see Vranas 2008: 536) as the prescription whose satisfaction proposition is the violation proposition of  $I$  and whose violation proposition is the satisfaction proposition of  $I$  (for example, the negation of “hide” is “don’t hide”, and the negation of “if there is a tornado, hide” is “if there is a tornado, don’t hide”). In this case, necessarily, every fact that guarantees  $P$  supports the negation of  $I$  and thus does not support  $I$  (since, necessarily, every fact that supports the negation of  $I$  does not support  $I$ , given that favoring is asymmetric);<sup>41</sup> so, necessarily, no fact both guarantees  $P$  and supports  $I$ . *Case 5:*  $P$  entails that no fact supports  $I$ . In this case, necessarily, no fact both guarantees  $P$  and supports  $I$ . Indeed, if one assumes for reductio that at some possible world

---

<sup>39</sup> One might propose the following alternative definition: a proposition and a prescription are inconsistent exactly if, necessarily, no fact both guarantees the proposition and *undefeatedly* supports the prescription (equivalently, the proposition entails that no fact undefeatedly supports the prescription; to see the equivalence, use a reasoning similar to that in note 11). If a proposition and a prescription are inconsistent according to Definition 7, they are also inconsistent according to the alternative definition. Not conversely, however: the proposition that no fact undefeatedly supports “run” and the prescription “run” are consistent according to Definition 7 (possibly, the fact that no fact undefeatedly supports “run” but you have promised to run both guarantees the proposition and supports the prescription) but are inconsistent according to the alternative definition. I have no clear intuition on whether the above proposition and prescription should count as inconsistent, but I think that Definition 7 is preferable to the alternative definition because I think that the General Definition, to which Definition 7 corresponds, is preferable to the most plausible definition of argument validity to which the alternative definition of inconsistency corresponds (see (4) in the Appendix).

<sup>40</sup> Given this assumption and the converse assumption that, necessarily, if it is necessary that no fact supports a given prescription, then the prescription is necessarily violated (cf. note 28), defining a prescription to be inconsistent exactly if it is necessarily violated (see Vranas 2008: 545-8 for a defense of this definition) is equivalent to defining a prescription to be inconsistent exactly if it is necessary that no fact supports it (and one can show then that a prescription  $I$  is inconsistent exactly if, for some necessary proposition  $P$ ,  $P$  and  $I$  are inconsistent). There is then no important disanalogy between my previously defended (Vranas 2008) definition of inconsistency for prescriptions (a definition that did not appeal to meriting endorsement) and Definition 7 (which does appeal to meriting endorsement).

<sup>41</sup> (1) If support is understood *weakly* (see §6.1), then for the above reasoning to go through  $I$  must be *unconditional* (see Vranas 2011: 389 n. 27). (2) The above reasoning, in conjunction with what I said in §3 (after I introduced Argument 4), fulfills the promise I made in §2.2.2 to defend the claim that the premises of Argument 3 are inconsistent. (3) Corresponding to relativized and quantified validity (see note 13), relativized and quantified consistency and inconsistency can be defined; quantified inconsistency is inconsistency relative to *all* possible times, agents, and kinds of support, whereas quantified consistency is consistency relative to *some* possible time, agent, and kind of support.

some fact  $f$  both guarantees  $P$  and supports  $I$ , then at that world it is the case both that no fact supports  $I$  (this follows from  $P$ ) and that  $f$  is a fact that supports  $I$ —a contradiction. I take it that in all five cases there is intuitively an incompatibility between the proposition and the prescription, and the desire to unify these cases motivates Definition 7.<sup>42</sup> The premises of the following three (trivially) valid arguments exemplify cases 3, 4, and 5 respectively:<sup>43</sup>

<p><u>Argument 28</u> Repent. It is impossible for you to repent. So: Letitia is a nun.</p>	<p><u>Argument 29</u> Repent. The fact that you have sworn not to repent is a conclusive reason for you not to repent. So: Letitia is a nun.</p>	<p><u>Argument 30</u> Repent. There is no reason for you to repent. So: Letitia is a nun.</p>
---	--	---

One might conjecture that, if a proposition and a prescription are inconsistent, then either the prescription entails the negation of the proposition or the proposition entails the negation of the prescription (or both). This is indeed so in the first four cases above, but some examples of the fifth case falsify the conjecture: “there is no reason for you to repent” and “repent” are inconsistent, but “repent” does not entail “there is a reason for you to repent” (see Argument 14) and “there is no reason for you to repent” does not entail “don’t repent” (because “there is no reason for you to repent” does not entail that there is any reason for you *not* to repent; see §3). (See Vranas 2011: 445 n. 75 for the failure of a comparable conjecture—and of its converse—concerning inconsistent prescriptions.) By contrast, it has in effect already been shown that the converse of the above conjecture is true: if  $I$  entails the negation of  $P$  or  $P$  entails the negation of  $I$ , then  $P$  and  $I$  are inconsistent (see cases 3 and 4 above).<sup>44</sup>

<sup>42</sup> It can be shown that the first three cases (but not the fourth one) can be subsumed under the fifth case. For example, concerning the first case: if  $P$  is impossible, then  $P$  (trivially) entails that no fact supports  $I$ . So the five cases are not mutually exclusive. To see that the five cases are not collectively exhaustive either, consider the prescription  $I$  expressed by “don’t tell the truth” and the proposition  $P$  that (1) you have sworn to tell the truth and (2) every fact that guarantees that you have sworn to tell the truth defeats the support that any fact provides to  $I$ . According to Definition 7,  $P$  and  $I$  are inconsistent: necessarily, every fact that guarantees  $P$  guarantees that you have sworn to tell the truth and defeats the support that any fact provides to  $I$ , and thus does not support  $I$  (because a fact that supports  $I$  cannot defeat that support). But  $P$  entails neither the negation of  $I$  (because  $P$  does not entail that any fact supports that negation) nor that no fact supports  $I$ , so this is not an example of the fourth or of the fifth case (and thus not of any of the first three cases either).

<sup>43</sup> Here are also five examples on which Definition 7 returns a verdict of *consistency* (cf. Vranas 2008: 562 n. 49). (1) The proposition that I do not permit you to kiss him and the prescription “kiss him” (cf. note 29) are consistent: possibly, they are both sustained by the fact that I do not permit you to kiss him but he will die if you do not kiss him. (2) The proposition that you are not permitted to kiss him and the prescription “kiss him” (cf. note 29) are consistent (contrast Hare 1967: 311): possibly, they are both sustained by the fact that you are required not to kiss him but he will be happy if you kiss him. (3) The proposition that you are already married to me and the prescription “marry me” (cf. note 33) are consistent: possibly, they are both sustained by the fact that you are already married to me but we have agreed to get a divorce and then get remarried. (4) The proposition that Dan has no daughter and the prescription expressed by “marry Dan’s only daughter” (understood as “if Dan has only one daughter, marry her”; if it is understood instead as the premise of Argument 20, see the last paragraph of §6.2.2) are consistent: possibly, they are both sustained by the fact that Dan has no daughter but you have promised that, if Dan has only one daughter, you will marry her. (5) The proposition that you will not marry me and the prescription “marry me” are consistent (cf. Williams 1966: 5): possibly, they are both sustained by the fact that you have promised to marry me but you will not marry me.

<sup>44</sup> Given Definition 7, the third consequence of Definition 6 that I examined above is equivalent to: if  $P \& \sim P'$  and  $I$  are consistent, then  $I$  and  $P$  do not jointly entail  $P'$ . The converse does not hold (contrast Sosa 1970: 221); for example, the argument from ( $I$ ) “marry me” and ( $P$ ) “the sky is blue” to ( $P'$ ) “there is a reason for you to marry me” is

Finally, a fifth consequence of Definition 6 is the following restricted version of Hare’s Thesis (see §4): if it is possible that the fact that  $P$  is true supports  $I$ , then  $P'$  follows from  $I$  and  $P$  only if  $P'$  follows from  $P$  alone (I show this in note 45).<sup>45</sup> For example, since it is possible that the fact that you have promised to repent supports “repent”, a proposition follows from “repent” and “you have promised to repent” only if it follows from “you have promised to repent” alone.

## 6. Mixed-premise imperative arguments

Recall that a mixed-premise imperative argument is an argument whose premises are a prescription and a proposition and whose conclusion is a prescription (see Table 1); for example, the argument from “if you sinned, repent” and “you sinned” to “repent”. Given that to sustain a proposition is to guarantee it and to sustain a prescription is to support it (see Table 2), the General Definition yields as a special case:

**DEFINITION 8.** A *mixed-premise imperative* argument is valid exactly if, necessarily, every fact that both supports the imperative premise and guarantees the declarative premise of the argument supports the (imperative) conclusion of the argument.

I conjecture that there is no useful equivalence theorem for mixed-premise imperative arguments, but I will render Definition 8 usable by providing several sufficient conditions (§6.1) and—indirectly—a necessary condition (§6.2) for a mixed-premise imperative argument to be valid.

### 6.1. Valid mixed-premise imperative arguments

Given the mixed-premise imperative argument from the prescription  $I$  and the proposition  $P$  to the prescription  $I'$ , say that its *pure subargument* is the argument from  $I$  to  $I'$ , and say that its *cross-species subargument* is the argument from  $P$  to  $I'$ . A first consequence of Definition 8 (in conjunction with Definition 2 and Definition 3) is that a mixed-premise imperative argument is valid if its pure subargument or its cross-species subargument is valid. A second consequence of Definition 8 (in conjunction with Definition 7) is that a mixed-premise imperative argument is valid if its premises are inconsistent. A third—and more interesting—consequence of Definition 8 is that the mixed-premise imperative argument from  $I$  and  $P$  to  $I'$  is valid if  $P$  entails that every fact that supports  $I$  also supports  $I'$ . Indeed, if  $P$  entails that every fact that supports  $I$  also supports  $I'$ , then, necessarily, if  $f$  is any fact that both supports  $I$  and guarantees  $P$ , then  $P$  is true and thus every fact that supports  $I$  also supports  $I'$ , so  $f$  supports  $I'$  (since  $f$  supports  $I$ ). For example, the following two arguments are valid:

#### Argument 31

Disarm the bomb.

“Disarm the bomb” entails

“cut the wire”.

#### Argument 32

Disarm the bomb.

Every reason for you to disarm the bomb

is a reason for you to cut the wire.

---

not valid (cf. Argument 14), but  $P \& \sim P'$  and  $I$  are inconsistent because  $\sim P'$  is (and thus  $P \& \sim P'$  entails) the proposition that no fact supports  $I$  (i.e., there is no reason for you to marry me).

<sup>45</sup> To show this, suppose that (1) at some possible world  $w$ , the fact—call it  $f_p$ —that  $P$  is true supports  $I$ , and that (2) at every possible world (and thus at  $w$ ), every fact that both supports  $I$  and guarantees  $P$  guarantees  $P'$ . Since, necessarily,  $f_p$  guarantees  $P$ , by (1)  $f_p$  both supports  $I$  and guarantees  $P$  at  $w$ , so by (2)  $f_p$  guarantees  $P'$  at  $w$ . Then, necessarily, if  $f_p$  exists, then  $P'$  is true. But, necessarily, if  $P$  is true, then  $f_p$  exists. So, necessarily, if  $P$  is true, then  $P'$  is true; i.e.,  $P$  entails  $P'$ .

So: Cut the wire.

So: Cut the wire.

Indeed, by Definition 2 the declarative premise of Argument 31 entails the proposition that every fact that supports “disarm the bomb” also supports “cut the wire”, and that proposition is equivalent to the declarative premise of Argument 32. Similarly, *if* the proposition that you can disarm the bomb only if you cut the wire entails that every reason for you to disarm the bomb is a reason for you to cut the wire (contrast Kolodny 2011), then the following argument is also valid:

Argument 33

Disarm the bomb.

You can disarm the bomb only if you cut the wire.

So: Cut the wire.<sup>46</sup>

The following theorem provides another sufficient condition for a mixed-premise imperative argument to be valid:

THEOREM 4. The mixed-premise imperative argument from the prescription  $I$  and the proposition  $P$  to the prescription  $I'$  is valid if  $P$  entails some prescription  $I^*$  such that, necessarily, every fact that supports both  $I$  and  $I^*$  also supports  $I'$ .

PROOF. Suppose that, (1) necessarily, every fact that guarantees  $P$  supports  $I^*$ , and that, (2) necessarily, every fact that supports both  $I$  and  $I^*$  also supports  $I'$ . Then, necessarily, every fact that both supports  $I$  and guarantees  $P$  supports both  $I$  and—by (1)— $I^*$ , and thus—by (2)—also supports  $I'$ .

The sufficient condition for validity provided by Theorem 4 is trivially satisfied if  $P$  entails  $I'$  (i.e., if the cross-species subargument of the mixed-premise imperative argument is valid). Before I apply Theorem 4 to a more interesting case, I need to go over a distinction between *strong* and *weak* support that I have introduced elsewhere (Vranas 2011: 384-90). Suppose it is a fact that you have promised to resign today. This fact is both a reason for you to resign today and a reason for you to resign. But it supports the prescriptions “resign today” and “resign” in different ways: it favors every proposition which entails that you resign today (and thus that your promise is not broken) over every proposition which entails that you do not resign today (and thus that your promise is broken), but it does not favor every proposition which entails that you resign over every proposition which entails that you do not resign (because, for example, it does not favor the proposition that you resign next year over the proposition that you do not resign: both propositions entail that your promise is broken). This example (in conjunction with other considerations; see Vranas 2011: 384-90) motivates the following definition:

---

<sup>46</sup> Similarly, *if* the proposition that Grimbly Hughes is the largest grocer in Oxford entails that every reason for you to go to the largest grocer in Oxford is a reason for you to go to Grimbly Hughes, then the argument from “go to the largest grocer in Oxford” and “Grimbly Hughes is the largest grocer in Oxford” to “go to Grimbly Hughes” is valid (cf. Geach 1958: 53; Hare 1952: 35; Pigden 2011: 2; Stalley 1972: 24-5). On arguments similar to Argument 33, see: Åqvist 1967: 23; Bergström 1962: 42; Grue-Sørensen 1939: 196-7; Hansen 2008: 4; Ledent 1942: 268-9; Poincaré 1913: 236; Rand 1939: 318, 1939/1962: 249; Rescher 1966: 100-1. One might claim that Argument 33 is not valid because the invalidity of its pure subargument (from “disarm the bomb” to “cut the wire”), which arises from the possibility that you disarm the bomb without cutting the wire, is not “rectified” by adding the premise that you can disarm the bomb only if you cut the wire, because that premise does not preclude the above possibility: maybe, although it is *possible* that you disarm the bomb without cutting (but rather, for example, by melting) the wire, you *cannot* do so (because, for example, you have no way to heat the wire). I reply that precluding the above possibility is not necessary for “rectifying” the invalidity: it is enough to add instead, for example, a declarative premise that entails “cut the wire” or that entails “don’t disarm the bomb”.

**DEFINITION 9.** A fact (1) *strongly supports* a prescription exactly if it favors every proposition which entails the satisfaction proposition of the prescription over every proposition which entails the violation proposition of the prescription, and (2) *weakly supports* a prescription *I* exactly if it strongly supports some prescription *I\** whose satisfaction proposition entails the satisfaction proposition of *I* and whose context is the same as the context of *I*.<sup>47</sup>

The distinction between strong and weak support did not matter in this paper so far (with a single exception: see note 41), but it does matter from now on. Note that the concepts I have defined in terms of support—namely the concepts of sustaining, being a reason for, meriting endorsement, being valid, entailing, following from, and being consistent—can be understood either in terms of strong support or in terms of weak support. In particular, define (for prescriptions) *strong sustaining* as strong support and *weak sustaining* as weak support (for propositions, define both strong and weak sustaining as guaranteeing; see Table 2), and say that an argument is (1) *s/s valid* exactly if, necessarily, every fact that *strongly* sustains every premise of the argument also *strongly* sustains the conclusion of the argument, and is (2) *w/w valid* exactly if, necessarily, every fact that *weakly* sustains every premise of the argument also *weakly* sustains the conclusion of the argument.<sup>48</sup> To simplify the exposition, I will continue to talk about support and validity simpliciter; whenever in the remainder of this section (including §6.2) I do this, *I should be understood as talking about weak support and w/w validity* (and similarly for sustaining etc.). In fact, from now on I use the more precise terminology only in some notes (never in the text).

The following theorem complements Theorem 4:

**THEOREM 5.** Let *C*, *C\**, and *C'* be the contexts and *V*, *V\**, and *V'* be the violation propositions of the prescriptions *I*, *I\**, and *I'* respectively, and suppose that *C* entails *C\** or *C\** entails *C*. Then (1) and (2) are equivalent:

(1) Necessarily, every fact that supports both *I* and *I\** also supports *I'*.

---

<sup>47</sup> In the above example, the fact that you have promised to resign today strongly and weakly supports the prescription “resign today”, and weakly but not strongly supports the prescription “resign”. For the sake of simplicity, the above definition of strong support differs in two respects from my previously proposed definition of strong support (Vranas 2011: 386): the above definition (1) omits the “satisfaction indifference condition”, which is not needed for my main results, and (2) has the consequence (cf. note 6) that any fact that strongly supports a prescription favors an impossible proposition over itself (because an impossible proposition entails both the satisfaction and the violation proposition of any prescription). Note that strong support entails both weak support and support, but weak support does not entail support (see Vranas 2011: 389 n. 27); nevertheless, I assume throughout the paper that every fact that weakly supports a prescription is a reason.

<sup>48</sup> Elsewhere (Vranas 2011: 433-7) I have proved the following *Equivalence Theorem*: if *S*, *V*, and *C* are, respectively, the satisfaction proposition, the violation proposition, and the context of the conjunction of the premises of a pure imperative argument and *S'*, *V'*, and *C'* are similarly defined for the conclusion of the argument, then (1) the argument is s/s valid exactly if either *V* is necessary or both *S'* entails *S* and *V'* entails *V*, and (2) the argument is w/w valid exactly if both *C'* entails *C* and *V'* entails *V*. A corollary of this theorem is that every s/s valid pure imperative argument is also w/w valid, so for *pure* imperative arguments I prefer “strongly valid” to “s/s valid” and “weakly valid” to “w/w valid”. I do not use this alternative terminology for *mixed-premise* imperative arguments, however, because some s/s valid mixed-premise imperative arguments are *not* w/w valid; an example is the argument from (a) the prescription “if you sinned, don’t repent” and (b) the proposition that the fact that you have sworn to repent if you sinned undefeatedly weakly supports “if you sinned, repent” to (c) the prescription “run” (one can show that the premises of this argument are weakly but not strongly consistent). One can show that every s/s valid cross-species imperative argument (see Table 1) is also w/w valid, and that every w/w valid cross-species declarative or mixed-premise declarative argument is also s/s valid.

(2)  $C'$  entails the disjunction of  $C$  and  $C^*$ , and  $V'$  entails the disjunction of  $V$  and  $V^*$ .<sup>49</sup>

One can now show that the following argument is valid:

Argument 34

If you promise to marry him, marry him. ( $I$ )

The fact that he is already married is an undefeated reason for you *not* to marry him. ( $P$ )

So: Don't promise to marry him. ( $I'$ )

Indeed, the sufficient condition for validity provided by Theorem 4 is satisfied:  $P$  entails the prescription ( $I^*$ ) “don't marry him” (see §3), and (1) above (in Theorem 5) holds because (2) holds. (2) holds because (a) the context of  $I'$  entails the disjunction of the contexts of  $I$  and  $I^*$  (because the context of  $I^*$  is necessary), and (b) the violation proposition of  $I'$ , namely the proposition that you promise to marry him, entails that you marry him or you promise to marry him, which is equivalent to the disjunction of the violation propositions of  $I$  and  $I^*$  (namely of the propositions (i) that you promise to marry him but you do not marry him and (ii) that you marry him).

6.2. Invalid mixed-premise imperative arguments

The following theorem enables one to show that certain mixed-premise imperative arguments are *not* valid:

THEOREM 6. If  $I'$  is unconditional and  $P$  is consistent with the proposition that some fact undefeatedly supports  $I \& \sim I'$  (i.e., the conjunction of  $I$  with the negation of  $I'$ ), then the mixed-premise imperative argument from  $I$  and  $P$  to  $I'$  is *not* valid.<sup>50</sup>

<sup>49</sup> To be explicit, Theorem 5 is about *weak* support. Before I prove Theorem 5, I introduce a definition: a pure imperative argument is *non-conjunctively w/w valid* exactly if, necessarily, every fact that weakly supports *every* premise of the argument also weakly supports the conclusion of the argument. By Definition 5 and the Equivalence Theorem in note 48, Theorem 5 is equivalent to the following theorem: given any two-premise pure imperative argument such that the context of one of its premises entails the context of the other, the argument is non-conjunctively w/w valid exactly if it is w/w valid. This theorem is a consequence of the conjunction of two claims: (1) necessarily, every fact that weakly supports the conjunction of two prescriptions also weakly supports both conjuncts (see Vranas 2011: 398 n. 38 for a proof), and (2) if the context of one of two prescriptions entails the context of the other, then, necessarily, every fact that weakly supports both prescriptions also weakly supports their conjunction. To prove (2), suppose that  $C^*$  entails  $C$ , and take any fact  $f$  that (at some possible world) weakly supports both  $I$  and  $I^*$ . Then, by Definition 9,  $f$  strongly supports some prescriptions  $I'$  and  $I'^*$  such that  $C' \sqsubseteq C$ ,  $C^* \sqsubseteq C^*$ ,  $S'$  entails  $S$ , and  $S'^*$  entails  $S^*$ —and thus  $V$  entails  $V'$  and  $V^*$  entails  $V'^*$ . By Definition 5, the context of  $I \& I^*$  is  $C \vee C^*$ ; this is just  $C$ , since  $C^*$  entails  $C$ , and thus is  $C'$ , since  $C' \sqsubseteq C$ . Given that  $f$  strongly supports  $I'$  and that  $C'$  is the context of  $I \& I^*$ , to show that  $f$  weakly supports  $I \& I^*$  it is enough (by Definition 9) to show that  $S'$  entails the satisfaction proposition of  $I \& I^*$ —or equivalently that the violation proposition of  $I \& I^*$ , namely  $V \vee V^*$ , entails  $V'$ . Given that  $V$  entails  $V'$ , it is enough to show that  $V^*$  entails  $V'$ . Given that  $V^*$  (entails  $C^*$  and thus) entails  $C'$ , it is enough to show that  $V^*$  entails  $\sim S'$ . To show this, suppose for reductio that  $V^* \& S'$  is possible. By Definition 9,  $f$  favors  $V^* \& S'$  over  $V \& S'^*$  (because  $V^* \& S'$  entails  $S'$ ,  $V \& S'^*$  entails  $V'$ , and  $f$  strongly supports  $I'$ ), and  $f$  also favors  $V \& S'^*$  over  $V^* \& S'$  (because  $V \& S'^*$  entails  $S'^*$ ,  $V^* \& S'$  entails  $V^*$  and thus) entails  $V'^*$ , and  $f$  strongly supports  $I'^*$ ). But this contradicts the asymmetry of favoring, and the reductio is complete.

<sup>50</sup> To be explicit, Theorem 6 is about *weak* support and *w/w* validity. I will prove the following generalization of Theorem 6: if  $I \& \sim I'$  is unconditional,  $\sim V$  entails  $C'$ , and  $P$  is consistent with the proposition that some fact undefeatedly weakly supports  $I \& \sim I'$ , then the argument from  $I$  and  $P$  to  $I'$  is not w/w valid. To prove this, note first that, necessarily, if  $P$  is consistent with the proposition that some fact  $f$  undefeatedly weakly supports  $I \& \sim I'$ , then, possibly, some fact (e.g., the conjunction of  $f$  with the fact that  $P$  is true) both guarantees  $P$  and weakly supports  $I \& \sim I'$ . So to show (under the conditions of the theorem) that, possibly, some fact guarantees  $P$  and weakly supports  $I$  but does not weakly support  $I'$  (i.e., that the argument from  $I$  and  $P$  to  $I'$  is not w/w valid), it is enough to prove the

A first consequence of Theorem 6 is that the following argument is not valid (cf. Parsons 2013: 88):

Argument 35

Either marry him or dump him. (*I*)  
 You are not going to marry him. (*P*)  
 So: Dump him. (*I'*)

Indeed, *I'* is unconditional, and the proposition that some fact undefeatedly supports “marry him and don’t dump him” (which is  $I \& \sim I'$ , as one can show by using Definition 5) does not entail that you are going to marry him (people do not always do what there is an undefeated reason for them to do) and thus is consistent with *P*.<sup>51</sup> To see that the result that Argument 35 is not valid<sup>52</sup> is intuitively acceptable, compare Argument 35 with the following two arguments:

Argument 36

Either marry him or dump him.  
 You are not going to marry him,  
 and you are not going to dump him.  
 So: Dump him.

Argument 37

Either marry him or dump him.  
 You are not going to marry him,  
 and you are not going to dump him.  
 So: Marry him.

One gets an argument equivalent (see §2.1) to Argument 36 by adding to the premises of Argument 35 a declarative premise (“you are not going to dump him”). But adding declarative premises preserves validity. Therefore, if Argument 35 is valid, Argument 36 is also valid. Moreover, if Argument 36 is valid, Argument 37 is also valid (by symmetry). Since these relations between the three arguments are intuitively clear, if Argument 36 or Argument 37 is intuitively not valid,

following *lemma*: if  $I \& \sim I'$  is unconditional and  $\sim V$  entails  $C'$ , then, necessarily, every fact that weakly supports  $I \& \sim I'$  also weakly supports *I* but does not weakly support *I'*. To prove this lemma, suppose that  $I \& \sim I'$  is unconditional and  $\sim V$  entails  $C'$ , and take any fact *f* that (at some possible world) weakly supports  $I \& \sim I'$  and thus (by Definition 9) strongly supports some unconditional prescription  $I^*$  whose satisfaction proposition  $S^*$  is possible (given my standing assumption that, necessarily, a necessarily violated prescription is necessarily not supported by any fact) and entails the satisfaction proposition of  $I \& \sim I'$ , namely  $\sim(V \vee S)$ —and thus also entails  $C'$  (since  $\sim(V \vee S)$  entails  $\sim V$ , which entails  $C$ ). By claim (1) in note 49, *f* weakly supports both *I* and  $\sim I'$ . To show that *f* does not weakly support *I'*, suppose for reductio that it does. Then *f* weakly supports both *I'* and  $\sim I'$ , and thus (by Definition 9) strongly supports some prescriptions (with context  $C$ )  $I_1$  and  $I_2$  such that  $S_1$  entails  $S'$  and  $S_2$  entails  $V'$ —and thus  $V'$  entails  $V_1$  and  $S'$  entails  $V_2$ . Then, by Definition 9, *f* favors  $S_1$  over  $S_2$  (because  $S_2$  entails  $V_1$  and *f* strongly supports  $I_1$ ) and also favors  $S_2$  over  $S_1$  (because  $S_1$  entails  $V_2$  and *f* strongly supports  $I_2$ ), so  $S_1$  and  $S_2$  are both impossible and the violation proposition of  $I_1$  (and of  $I_2$ ) is  $C'$ . Since  $S^*$  entails  $C'$  and *f* strongly supports  $I_1$ , *f* favors any impossible proposition over  $S^*$ . But since *f* strongly supports  $I^*$ , *f* favors  $S^*$  over any impossible proposition. This contradicts the asymmetry of favoring (given that  $S^*$  is possible), and the reductio is complete.

<sup>51</sup> Theorem 6 shows that Argument 35 is not *w/w* valid. To see that Argument 35 is not *s/s* valid either, note first that the proposition that some fact *f* undefeatedly strongly supports *I* is consistent with *P*. Therefore, (1) possibly, some fact (e.g., the conjunction of *f* with the fact that *P* is true) both guarantees *P* and strongly supports *I*. But, (2) necessarily, every fact that strongly supports *I* does *not* strongly support *I'* (because, by Definition 9, necessarily, every fact that strongly supports *I* favors the proposition that you marry him and you do not dump him, which entails the satisfaction proposition of *I* but the violation proposition of *I'*; over any impossible proposition, which entails the violation proposition of *I* but the satisfaction proposition of *I'*). (1) and (2) jointly entail that, possibly, some fact guarantees *P* and strongly supports *I* but does not strongly support *I'*; i.e., Argument 35 is not *s/s* valid.

<sup>52</sup> One can similarly show that the “Catch-22” argument in §1 and the mixed-premise imperative argument in Table 1 (cf. Argument 38) are not valid. Concerning the remaining mixed arguments in Table 1, in my view the cross-species imperative argument is valid (if Argument 9 is valid), the cross-species declarative argument is ambiguous (cf. Argument 19 and Argument 20), and the mixed-premise declarative argument is not valid (cf. Argument 27).

then Argument 35 is intuitively not valid either. But it should be intuitively clear that neither Argument 36 nor Argument 37 is valid: intuitively, from “do X or Y” and “you are not going to do X or Y” neither “do X” nor “do Y” follows. So Argument 35 is intuitively not valid either.<sup>53</sup>

The reasoning in the previous paragraph relied on the claim that adding declarative premises preserves validity. This claim—call it *Declarative Monotonicity*—is a consequence of the General Definition and is intuitively acceptable, but might be rejected by proponents of non-monotonic pure declarative logics. I reply that my project in this paper is to defend a definition of *deductive* validity that yields as a special case the *standard* (monotonic) definition of validity for pure declarative arguments; defending that standard definition lies beyond the scope of this paper. So in this paper I assume that Declarative Monotonicity holds.<sup>54</sup>

A second consequence of Theorem 6 is that the following argument is not valid:

---

<sup>53</sup> Similar remarks apply to the argument—call it *Argument 33\**—from “disarm the bomb” (*I*) and “you will disarm the bomb only if you cut the wire” (*P*) to “cut the wire” (*I*). (Contrast Argument 33.) By Theorem 6, Argument 33\* is not valid: *I*’s unconditional, and the proposition that some fact undefeately supports “disarm the bomb without cutting the wire” (which is  $I \& \sim I$ ) does not entail that you will disarm the bomb without cutting the wire (i.e., does not entail that *P* is false) and thus is consistent with *P*. The result that Argument 33\* is not valid is intuitively acceptable because (1) the arguments (a) from “disarm the bomb” and “you will not disarm the bomb” to “cut the wire” and (b) from “disarm the bomb” and “you will cut the wire” to “cut the wire” are intuitively not valid (cf. MacKay 1969: 153, 1971: 94; Parsons 2013: 68; Bennett 1970: 318) but (2) one gets arguments equivalent to the above two by adding to the premises of Argument 33\* the declarative premises “you will not disarm the bomb” and “you will cut the wire” respectively, so—it is intuitively clear that—the above two arguments are valid if Argument 33\* is valid (because adding declarative premises preserves validity). On arguments similar to Argument 33\*, see: Bennett 1970: 318; MacKay 1969: 150-1; Rescher 1966: 99; Sosa 1964: 89; Stalley 1972: 23-4; Vetter 1971: 75-6.

<sup>54</sup> Some people might accept the standard definition of validity for pure declarative arguments and still reject Declarative Monotonicity because (1) they reject the claim that adding *imperative* premises preserves validity—call this claim *Imperative Monotonicity*—and (2) they reason as follows that Declarative Monotonicity entails Imperative Monotonicity: if Declarative Monotonicity holds, then, for any prescription *I*, adding to the premises of a valid argument a declarative premise that entails *I* preserves validity, but then adding instead the imperative premise *I* also preserves validity, and Imperative Monotonicity also holds. Concerning first (2) above, I reply that the above reasoning is mistaken: even if an argument whose premises include a proposition *P* that entails a prescription *I* is valid, the argument that one gets by replacing *P* with *I* need not be valid. For example, the argument from the proposition “the fact that you have promised to marry me is an undefeated reason for you to marry me” to the proposition “there is a reason for you to marry me” is valid, and the former proposition entails “marry me” (cf. Argument 4), but the argument from “marry me” to “there is a reason for you to marry me” (Argument 14) is not valid. So those who reject Imperative Monotonicity should not reject Declarative Monotonicity on the basis of the above reasoning. Concerning now (1) above, by using claim (1) in note 49 one can show that Imperative Monotonicity is a consequence of the General Definition (for *weak* support; Imperative Monotonicity fails for strong support), so let me address an objection to Imperative Monotonicity. One might claim (cf. Horty 1997: 35-6) that (a) the argument from “don’t eat with your fingers” to “if you eat asparagus, don’t eat with your fingers” is valid but (b) the argument from “don’t eat with your fingers” and “if you eat asparagus, eat with your fingers” to “if you eat asparagus, don’t eat with your fingers” is not valid. I reply that the conjunction of the premises of the second argument is “don’t eat asparagus, and don’t eat with your fingers” (as one can show by using Definition 5), and the argument is w/w valid (as one can show by using the Equivalence Theorem in note 48). Perhaps those who deny the validity of the second argument understand its first premise as “except if you eat asparagus, don’t eat with your fingers”, and thus as different from the premise of the first argument; but then we have no counterexample to Imperative Monotonicity (contrast Horty 1994: 58-60). Note finally that, if Imperative Monotonicity holds and Argument 35 is valid, then the argument that one gets—call it *Argument 35\**—by adding to the premises of Argument 35 the imperative premise “marry him” is also valid. But the conjunction of “either marry him or dump him” with “marry him” is just “marry him” (as one can show by using Definition 5), so Argument 35\* is equivalent to the argument from “marry him” and “you are not going to marry him” to “dump him” and thus is (intuitively) not valid. It follows that, if Imperative Monotonicity holds, then Argument 35 is (intuitively) not valid either.



### Argument 38

If you drink (at the party), don't drive (after the party). (*I*)

You are going to drink (at the party). (*P*)

So: Don't drive (after the party). (*I*)

Indeed, *I'* is unconditional, and the proposition that some fact undefeatedly supports “drive (after the party) and don't drink (at the party)” (which is  $I \& \sim I'$ , as one can show by using Definition 5) does not entail that you are not going to drink (people do not always do what there is an undefeated reason for them to do) and thus is consistent with *P*.<sup>55</sup> The result that Argument 38 is not valid<sup>56</sup> may be surprising, so I will argue (in §6.2.1) in two ways that the result is intuitively acceptable, and then I will suggest an explanation (in §6.2.2) of why Argument 38 (mistakenly) appears valid.

#### 6.2.1. Why Argument 38 is intuitively not valid

Here is a first way to see that the result that Argument 38 is not valid is intuitively acceptable. Consider the following two arguments:

#### Argument 39

Don't drive. (*I*)

So: If you *don't* drink, don't drive. (*I'*)

#### Argument 40

If you drink, don't drive. (*I*)

You are going to drink. (*P*)

So: If you *don't* drink, don't drive. (*I'*)

One can show (by using the Equivalence Theorem in note 48) that Argument 39 is valid. I have extensively argued in previous work (Vranas 2011: 399-402) that such a result is intuitively acceptable: briefly, “don't drive” is the conjunction of “if you drink, don't drive” with “if you don't drink, don't drive” (as one can show by using Definition 5) and thus entails the first conjunct. Given that Argument 39 is valid, Argument 40 is also valid if Argument 38 is valid (by the transitivity of entailment). This relation between the three arguments is intuitively clear, and Argument 39 is intuitively valid; so, if Argument 40 is intuitively not valid, then Argument 38 is

---

<sup>55</sup> Theorem 6 shows that Argument 38 is not *w/w* valid. To see that Argument 38 is not *s/s* valid either, note first that the proposition that some fact *f* undefeatedly strongly supports the prescription (*I'*) “if you drink, don't drive, and if you don't drink, drive” is consistent with *P*. Therefore, (1) possibly, some fact (e.g., the conjunction of *f* with the fact that *P* is true) both guarantees *P* and strongly supports *I'*. Moreover, (2) necessarily, every fact that strongly supports *I'* also strongly supports *I* (as one can show by using the Equivalence Theorem in note 48) but does *not* strongly support *I'* (because, by Definition 9, necessarily, every fact that strongly supports *I'* favors the proposition that you drive and you do not drink, which entails the satisfaction proposition of *I'* but the violation proposition of *I'*, over the proposition that you do not drive and you do not drink, which entails the violation proposition of *I'* but the satisfaction proposition of *I*). (1) and (2) jointly entail that, possibly, some fact guarantees *P* and strongly supports *I* but does not strongly support *I'*; i.e., Argument 38 is not *s/s* valid.

<sup>56</sup> One might claim that Argument 38 is so intuitively compelling that there must be an interesting and satisfactory definition of validity on which the argument is valid. I reply that I cannot exclude this, but I have yet to see such a definition. Alternatively, one might claim that Argument 38 is valid even on my definition of validity because *P* entails that every fact that supports *I* also supports *I'* (see §6.1): necessarily, if you are going to drink, then every reason for you not to drive if you drink is a reason for you not to drive. I reply that this is false: *P* is consistent with the proposition (*O*) that some fact supports *I* but does not support *I'*. This is because (1) *O* follows from the proposition that some fact supports  $I \& \sim I'$  (see the lemma in note 50) and (2) the latter proposition is consistent with *P*: the proposition that some fact supports “drive and don't drink” does not entail that you are not going to drink.

intuitively not valid either. But Argument 40 is intuitively not valid.<sup>57</sup> So Argument 38 is intuitively not valid either. (Again, this is a claim about *tutored* intuitions; I am not denying that some people may have the *raw* intuition that Argument 38 is valid.)

Here is also a second way to see that the result that Argument 38 is not valid is intuitively acceptable. Consider the following argument:

Argument 41

If you drink, don't drive. (*I*)

You are going to drink, (*P*)

and the fact that you have sworn not to drive if you drink  
is an undefeated reason for you not to drive if you drink, (*Q*)

but the fact that your daughter will die if you don't drive  
her to the hospital is an undefeated reason for you to drive. (*R*)

So: Don't drive. (*I'*)

By Declarative Monotonicity, Argument 41 is valid if Argument 38 is valid. This relation between the two arguments is intuitively clear; so, if Argument 41 is intuitively not valid, then Argument 38 is intuitively not valid either. But Argument 41 is intuitively not valid: intuitively, its premises entail “drive”, not “don't drive”. So Argument 38 is intuitively not valid either. Moreover, it is a consequence of Theorem 6 that Argument 41 is not valid: its declarative premise (namely the conjunction of *P*, *Q*, and *R*) is consistent with—in fact, entails—the proposition that some fact undefeatedly supports “drive and don't drive” (which is  $I \& \sim I'$ ). Those who think that Argument 38 is valid might respond that Argument 41 *is* valid because its declarative premise is inconsistent: it entails “don't drive” (via *Q*—which entails *I*—and *P*, since Argument 38 is assumed to be valid), but it also entails “drive” (via *R*). I reply that the declarative premise of Argument 41 is clearly consistent: *Q* and *R* are jointly consistent (they jointly entail—see (2) in note 49—that some fact undefeatedly supports the conjunction of “drive” with “if you drink, don't drive”, namely “drive and don't drive”), and their conjunction does not entail that you are not going to drink (people do not always do what there is an undefeated reason for them to do) and thus is consistent with *P*. So I take the result that the declarative premise of Argument 41 is inconsistent *if* Argument 38 is valid to *support* my claim that Argument 38 is not valid. Note also

---

<sup>57</sup> (1) One might claim that Argument 40 is trivially valid because its conclusion is *irrelevant* given its declarative premise. I do not see how the irrelevance results in validity, but in any case the objection can be bypassed by replacing in the text the conclusion *I''* with “if there is a conclusive reason for you to drive, don't drive”—a prescription which is *not* irrelevant given the premise that you are going to drink. (2) One might note that the pure imperative argument from “if you drink, don't drive” and “drink” to “if you don't drink, don't drive” is—weakly but not strongly—valid (as one can show by using the Equivalence Theorem in note 48); how does this cohere with my claim that Argument 40 is intuitively not valid? I reply that the above pure imperative argument fails to be intuitively invalid because its conclusion is *redundant* (see Vranas 2011: 396), in the sense that its conjunction with the conjunction of the premises is the same as the conjunction of the premises (namely “drink and don't drive”). I see no similar reason for saying that Argument 40 fails to be intuitively invalid. (3) One might note that the pure declarative argument from “if you drink, you won't drive” and “you are going to drink” to “if you don't drink, you won't drive” is intuitively not valid but nevertheless valid; why not say the same thing about Argument 40? I reply that this suggestion (a) grants that Argument 40 is *intuitively* not valid, which is what I am claiming (in order to argue that the result that Argument 38 is not valid is intuitively acceptable), and (b) fails to refute the claim that Argument 40 is *in fact* not valid: in the Appendix I point out that some arguments are not valid although their “corresponding” pure declarative arguments are valid. (On the other hand, I have no proof that Argument 40 is not valid: Theorem 6 cannot be used because *I''* is conditional, and one can show that the generalization of Theorem 6 in note 50 cannot be used either.)

that, since the declarative premise of Argument 41 entails the imperative premise (via  $Q$ ), the premises of Argument 41 are jointly consistent.<sup>58</sup>

One might object as follows to my claim that Argument 38 is not valid. Take any fact that both supports the imperative premise  $I$  (“if you drink, don’t drive”) and guarantees the declarative premise  $P$  (“you are going to drink”) of Argument 38; for example, the fact that you are going to drink and you have promised that, if you drink, you will not drive. It seems that such a fact also supports the conclusion  $I'$  (“don’t drive”) of Argument 38, and thus that Argument 38 is valid. I reply that, even if *some* facts that both support  $I$  and guarantee  $P$  also support  $I'$ , this need not be so for *all* facts. For example, suppose it is a fact—call it  $f$ —that the declarative premise of Argument 41 is true. This fact both (undefeatedly) supports  $I$  (because it guarantees  $Q$ , which entails  $I$ ) and guarantees  $P$ , but it does not support  $I'$  because it (undefeatedly) supports  $\sim I'$  (“drive”).<sup>59</sup> This example shows that meriting *all-things-considered* endorsement (see D2JA in §2.2.3) is not transmitted from the premises to the conclusion of Argument 38: although  $f$  undefeatedly supports  $I$  and guarantees  $P$ , no fact undefeatedly supports  $I'$ . Indeed, if one assumes for reductio that some fact  $f'$  undefeatedly supports  $I'$ , then (given that  $f$  undefeatedly supports  $\sim I'$ ) the conjunction of  $f$  with  $f'$  supports both  $I'$  and  $\sim I'$ , contradicting the asymmetry of favoring. (The above example also shows that a man who drinks and has an undefeated reason not to drive if he drinks need not behave irrationally if he drives: he may have a reason not to drive, but he may also have a stronger reason to drive—e.g., the fact that his daughter will die if he does not drive her to the hospital.) One might respond that the above example does not falsify the claim that meriting *pro tanto* endorsement (see D2JP in §2.2.3) is transmitted from the premises to the conclusion of Argument 38.<sup>60</sup> In note 60 I use a different example to falsify that

---

<sup>58</sup> Interestingly, the “inconsistency response” does work against an attempt to argue that, contrary to what I said in §6.1, Argument 32 is *not* valid. More specifically, consider the argument—call it *Argument 32\**—from “disarm the bomb” and “every reason for you to disarm the bomb is a reason for you to cut the wire ( $P^+$ ), and the fact that someone will die if you don’t disarm the bomb is an undefeated reason for you to disarm the bomb ( $Q^+$ ), but the fact that ten other bombs will explode and ten people will die if you cut the wire is an undefeated reason for you *not* to cut the wire ( $R^+$ )” to “cut the wire”. By Declarative Monotonicity, Argument 32\* is valid if Argument 32 is valid. But Argument 32\* is not valid, so Argument 32 is not valid either—or so one might argue. I reply that Argument 32\* *is* valid because its declarative premise is inconsistent:  $Q^+$  and  $R^+$  jointly entail that some reason for you to disarm the bomb is not a reason for you to cut the wire, which is the negation of  $P^+$ .

<sup>59</sup> In this example,  $f$  guarantees  $P$  and *weakly* supports  $I$  but not  $I'$ . For an example in which a fact guarantees  $P$  and *strongly* supports  $I$  but not  $I'$ , suppose that the prescription “if you drink, don’t drive, and if you don’t drink, drive” is strongly supported by the fact that (1) you are going to drink and (2) you have promised that, if and only if you drink, you will not drive. Then this fact guarantees  $P$  and (as explained in note 55) strongly supports  $I$  but not  $I'$ .

<sup>60</sup> The point is that, although the above example (and, more generally, the possibility that some fact—like  $f$ —guarantees  $P$  and supports  $I$  but does not support  $I'$ ) falsifies the claim that, (1) necessarily, every fact that both supports  $I$  and guarantees  $P$  also supports  $I'$ ; it does not falsify the claim that, (2) necessarily, if some fact both supports  $I$  and guarantees  $P$ , then some (maybe *different*) fact supports  $I'$ : in the above example, although  $f$  does not support  $I'$ , maybe some different fact does. I reply that a different example falsifies (2). Suppose that “don’t drink” (and thus also  $I$ ; see the Equivalence Theorem in note 48) is supported by the fact  $g$  that (a) you have promised not to drink, (b) you are going to drink, and (c) there is no reason for you not to drive. Then some fact (namely  $g$ ) both supports  $I$  and guarantees  $P$ , but no fact supports  $I'$ , so transmission of meriting *pro tanto* endorsement jointly (and thus also separately) fails for Argument 38. Similarly, to see that transmission of meriting *pro tanto* endorsement fails for Argument 35, suppose that “marry him” (and thus also “either marry him or dump him”; see the Equivalence Theorem in note 48) is supported by the fact that (i) you have promised to marry him, (ii) you are not going to marry him, and (iii) there is no reason for you to dump him. Then some fact both supports “either marry him or dump him” and guarantees that you are not going to marry him, but no fact supports “dump him”.

claim, but here I reply that, even if the claim is true, it does not follow that Argument 38 is valid: transmission of meriting pro tanto endorsement is not sufficient for a mixed-premise imperative argument to be valid, as one can show by considering the (invalid) argument from “drive” and “there is a reason for you to tell the truth” to “tell the truth” (cf. Argument 7; see also Argument 14).

### 6.2.2. *Why Argument 38 (mistakenly) appears valid*

If Argument 38 is not valid, why does it *appear* valid? To suggest an explanation, I introduce first some concepts. Say that a proposition is *practically necessary* exactly if it is true and it would be true no matter what one were to do (among the things that one can do).<sup>61</sup> Say that two prescriptions are *practically equivalent* exactly if it is practically necessary that (1) their satisfaction propositions are materially equivalent and (2) their violation propositions are materially equivalent. Consider the following assumption:

EQUIVALENCE ASSUMPTION. Necessarily, if two prescriptions are practically equivalent, then every fact that supports one of them also supports the other. (In other words: necessarily, practically equivalent prescriptions are supported by exactly the same facts.)

Now consider the following argument:

#### Argument 42

If you drink, don’t drive. (*I*)

It is unavoidable (i.e., practically necessary) that you drink. (*P*\*)

So: Don’t drive. (*I*’)

As I show in a note, *P*\* entails that *I* and *I*’ are practically equivalent.<sup>62</sup> Therefore, if the Equivalence Assumption is true, *P*\* entails that every fact that supports *I* also supports *I*’; and then Argument 42 is valid (see §6.1).<sup>63</sup> I suggest that Argument 38 appears valid largely because it is

<sup>61</sup> What I call “practical necessity” amounts to one way of understanding what is known as “power necessity” (for an agent at a time), namely the way that corresponds to “C1” in Carlson’s (2000: 280) useful taxonomy. (Cf.: Finch & Warfield 1998: 525; Huemer 2000: 538; McKay & Johnson 1996: 120; Speak 2011; see also: Belzer & Loewer 1994: 411 n. 11; Carmo & Jones 2002: 287.) The operator of practical necessity is a *normal* modal operator; i.e., if *P* and  $P \rightarrow Q$  (namely the disjunction of *Q* with the negation of *P*) are practically necessary, then *Q* is also practically necessary. Indeed: if *P* and  $P \rightarrow Q$  are practically necessary, then (1) *Q* is true because *P* and  $P \rightarrow Q$  are true, and (2) *Q* would be true (i.e.,  $\sim Q$  would be false) no matter what one were to do (among the things that one can do) because otherwise, since *P* is true and would be true no matter what one were to do (among the things that one can do), one could do something such that, if one were to do it, then  $P \& \sim Q$  might be true (i.e.,  $P \rightarrow Q$  might be false), contradicting the practical necessity of  $P \rightarrow Q$ . (See Carlson 2000: 286-7 for a similar derivation.)

<sup>62</sup> Suppose *P*\* is true: it is practically necessary that you drink. (1) It is necessary—and thus practically necessary—that, if *I* is satisfied (i.e., if you drink and do not drive), then *I*’ is also satisfied (i.e., you do not drive). (2) Since it is practically necessary that you drink, it is also practically necessary that, if *I*’ is satisfied (i.e., if you do not drive), then *I* is also satisfied (i.e., you drink and do not drive). So *P*\* entails that it is practically necessary that the satisfaction propositions of *I* and *I*’ are materially equivalent. Similarly for the violation propositions.

<sup>63</sup> On the basis of my arguments to the effect that Argument 38 is (intuitively) not valid, one might raise three objections to my claim that those who accept (the intuitive acceptability of) the Equivalence Assumption should also accept that Argument 42 is (intuitively) valid. (1) One might take Theorem 6 to show that Argument 42 is not valid. I reply that Theorem 6 does not show this (if the Equivalence Assumption is true). Indeed, (one can show that) *P*\* entails that  $I \& \sim I$ ’ (namely “drive and don’t drink”) and “drink and don’t drink” are practically equivalent. Therefore, if the Equivalence Assumption is true, *P*\* entails that a fact supports  $I \& \sim I$ ’ exactly if it supports “drink and don’t drink”, so *P*\* entails that no fact supports  $I \& \sim I$ ’ (given that, necessarily, no fact supports “drink and don’t drink”) and thus *P*\* is inconsistent with the proposition that some fact undefeately supports  $I \& \sim I$ ’. (2) If Argument

confused with Argument 42: for the purpose of evaluating the validity of Argument 38, one often treats its declarative premise as if it were practically necessary (i.e., one assumes that you are going to drink, and this leads one to disregard the fact—if it is a fact—that you can avoid drinking).<sup>64</sup> Similarly, consider the following two arguments:

Argument 43

If you lied, apologize. (*I*)

You lied. (*P*)

So: Apologize. (*I'*)

Argument 44

If you lied, apologize. (*I*)

It is practically necessary that you lied. (*P\**)

So: Apologize. (*I*)

By adapting my reasoning concerning Argument 42, one can show that Argument 44 is valid if the Equivalence Assumption is true.<sup>65</sup> I suggest then that Argument 43 appears valid largely be-

42 is valid, then the argument—call it *Argument 42\**—that one gets by adding to the premises of Argument 42 the declarative premises *Q* and *R* (see Argument 41) is also valid (by Declarative Monotonicity). But Argument 42\* is (intuitively) not valid, so Argument 42 is (intuitively) not valid either—or so one might argue. I reply that Argument 42\* is valid because the declarative premise *P\** of Argument 42 is inconsistent with *Q&R* (if the Equivalence Assumption is true). Indeed, (one can show that) *P\** entails that “don’t drink” and “drink and don’t drink” are practically equivalent. Therefore, if the Equivalence Assumption is true, *P\** entails that a fact supports “don’t drink” exactly if it supports “drink and don’t drink”, so *P\** entails that no fact supports “don’t drink” and thus *P\** is inconsistent with *Q&R* (which entails that some fact supports “don’t drink”). (3) If Argument 42 is valid, then (given that Argument 39 is valid) the argument—call it *Argument 42\*\**—from the premises of Argument 42 to “if you *don’t* drink, don’t drive” (*I'*) is also valid (by the transitivity of entailment). But Argument 42\*\* is (intuitively) not valid, so Argument 42 is (intuitively) not valid either—or so one might argue. I reply that, in my view, Argument 42\*\* is valid (if the Equivalence Assumption is true). Indeed, (one can show that) *P\** entails that *I'* and “if you drink and don’t drink, don’t drive” are practically equivalent. Therefore, if the Equivalence Assumption is true, *P\** entails that a fact supports *I'* exactly if it supports “if you drink and don’t drink, don’t drive”, so *P\** entails that every reason—and thus every fact that supports *I*—supports *I'* (given that “if you drink and don’t drink, don’t drive” is *empty* and thus is necessarily supported by every reason; see note 6) and thus Argument 42\*\* is valid. It will not do to respond that Argument 42\*\* is *intuitively* not valid: I take it that we have no clear intuitions about (prescriptions that are practically equivalent to) empty prescriptions.

<sup>64</sup> Cf. Greenspan 1975: 267. Deontic analogs of Argument 42 are instances of what has been called “unalterability detachment” (Nute & Yu 1997: 9). For contrasts somewhat analogous to the contrast between Argument 38 and Argument 42, see: Greenspan 1975; Kolodny & MacFarlane 2010: 138-40. Another reason why Argument 38 appears valid may be that Argument 38 is isomorphic to the pure declarative argument from “if you drink, you will not drive” and “you are going to drink” to “you will not drive”. But this cannot be the whole story: a similar reasoning would lead one to expect Argument 41 to appear *valid*, but it does not.

<sup>65</sup> One can show that, for Argument 44, the declarative premise entails that the imperative premise and the conclusion are practically equivalent (cf. note 62). For other arguments, however, one cannot show this; an example is the argument—call it *Argument 44\**—from “keep your promises” and “it is practically necessary that you have promised to marry him” to “marry him”. The declarative premise of Argument 44\* entails that you can keep your promises only if you marry him; so, *if* this in turn entails that every reason for you to keep your promises is a reason for you to marry him, then Argument 44\* is valid (cf. Argument 33). (Alternatively, one can show that Argument 44\* is valid by (1) using Definition 5 to show that “keep your promises” (understood as “do everything you have promised to do”) is the conjunction of “if you have promised to marry him, marry him” with “for everything other than marrying him, if you have promised to do it then do it” and (2) using Imperative Monotonicity (see note 54). But this alternative method of showing validity does not—whereas the previous method does—work for arguments like the one from “push every blue button” and “it is practically necessary that every round button is blue” to “push every round button”.) On arguments similar to Argument 44\*, including the widely discussed argument from “take all the boxes to the station” and “this is one of the boxes” to “take this to the station”, see: Bohnert 1945: 302; Grelling 1939: 44; Grue-Sørensen 1939: 197; Hamblin 1987: 87-9; Hare 1952: 25-8; Jörgensen 1938: 290, 1938/1969: 11; Juárez-Paz 1959: 200-3; Kelsen 1979: 336-7 n. 161, 1979/1991: 401-2 n. 161; Ledent 1942: 269; Lemmon 1965: 65; MacKay 1969: 148; McArthur & Welker 1974: 225; Moutafakis 1975: 37; Ramírez 2003: 131-

cause it is confused with Argument 44. One might respond that, although confusing Argument 38 with Argument 42 is a mistake, confusing Argument 43 with Argument 44 is in a sense not a mistake *if* it is necessary that one cannot change the past. Indeed, necessarily, if one cannot change the past and  $P$  is true, then—given that  $P$  is about the past— $P$  is practically necessary (i.e.,  $P^*$  is true). Conversely,  $P^*$  entails  $P$ : by definition, every practically necessary proposition is true. Therefore, if it is necessary that one cannot change the past, then  $P$  and  $P^*$  are necessarily equivalent, so Argument 43 is equivalent to Argument 44, and then Argument 43 is valid if the Equivalence Assumption is true.<sup>66</sup> I reply that, in my view, it is *not* necessary that one cannot change the past (see Vranas 2005) and (as a consequence of Theorem 6) Argument 43 is *not* valid.<sup>67</sup> This dispute, however, is unlikely to matter for practical purposes (if the Equivalence Assumption is true). This is because, even if (as I believe) confusing Argument 43 with Argument 44 is a mistake, those who put forward Argument 43 (e.g., in order to convince you to apologize) typically need not worry if the argument is not valid: they typically accept that one cannot change the past, so they may put forward Argument 44, which is valid (if the Equivalence Assumption is true) *regardless* of whether it is necessary that one cannot change the past. By contrast, the mistake of confusing Argument 38 with Argument 42 is likely to matter for practical purposes. This is because those who put forward Argument 38 (e.g., in order to convince you not to drive) typically need to worry if (as I argued) the argument is not valid: they typically do not accept that the proposition that you are going to drink is practically necessary (even if, as I suggested, they often treat it as if it were practically necessary), so they may not put forward Argument 42 and they may have no valid argument (with premises that merit endorsement) to convince you not to drive.

To conclude this section, consider a puzzling result: as I explain in note 67, if the Equivalence Assumption is true and it is necessary that one cannot change the past, then the proposition that

---

4; Rand 1939: 318, 1939/1962: 249; Ross 1941: 55, 60 n. 1, 68-9, 1941/1944: 32, 36 n. 8, 44; Sosa 1966, 1970: 221; Tammelo 1975: 39; Turnbull 1960: 380-1; cf. Bergström 1962: 48-9; Hansen 2008: 3; Holdcroft 1978: 85-6; Parsons 2012: 51; Sellars 1956: 239; Weinberger 1981: 21.

<sup>66</sup> Practical necessity (like support; see note 13) is relative to times and to agents: in general, what an agent can do at a time the agent cannot do at another time, and what an agent can do at a time another agent cannot do at the time. Similarly for practical equivalence, so strictly speaking the Equivalence Assumption is the claim that, necessarily, if two prescriptions are practically equivalent at time  $t$  for agent  $j$ , then every fact that supports at  $t$  relative to  $j$  one of the prescriptions also supports at  $t$  relative to  $j$  the other prescription. So if the declarative premise  $P^*$  of Argument 44 is understood as the claim that it is practically necessary *now* for *you* that you lied, then Argument 44 is valid relative to *now* and to *you* (if the Equivalence Assumption is true). On the other hand, if  $P^*$  is understood as the claim that it is practically necessary now for *everyone* that you lied (and this understanding is reasonable if it is necessary that *no one* can change the past), then Argument 44 is valid relative to now and to *everyone* (if the Equivalence Assumption is true).

<sup>67</sup> Here is why I take it to be a consequence of Theorem 6 that Argument 43 is not valid:  $I'$  is unconditional, and the proposition ( $N$ ) that some fact undefeately supports “don’t apologize, and let it be the case that you did not lie” (which is  $I \& \sim I'$ , as one can show by using Definition 5) does not entail that you did not lie and thus is consistent with  $P$ . Note, however, that (perhaps surprisingly), if the Equivalence Assumption is true and it is necessary that one cannot change the past, then the proposition ( $M$ ) that some fact supports “let it be the case that you did not lie” entails that you did not lie (and thus so does  $N$ , which entails  $M$ ). To see this, consider the contrapositive: the proposition ( $P$ ) that you lied entails that no fact supports “let it be the case that you did not lie”. Indeed, if it is necessary that one cannot change the past, then  $P$  entails  $P^*$  (as explained in the text); but  $P^*$  can be shown to entail that “let it be the case that you did not lie” and any necessarily violated prescription (e.g., “drink and don’t drink”) are practically equivalent, so  $P^*$  entails (if the Equivalence Assumption is true) that no fact supports “let it be the case that you did not lie” (given that, necessarily, no fact supports “drink and don’t drink”).

some fact supports “let it be the case that you did not lie” entails that you did not lie (so that, by contraposition and case 5 in §5, “you lied” and “let it be the case that you did not lie” are inconsistent). Those who do not know what to make of this result because they do not know how to make sense of prescriptions about the past (like “let it be the case that you did not lie”; cf. Vranas 2008: 555 n. 17) should note that a similar result holds for propositions and prescriptions about the present: if the Equivalence Assumption is true and it is necessary that one cannot change the present, then the proposition that some fact supports “let it be the case that the room is empty now” entails that the room is empty now (so that “the room is not empty now” and “let it be the case that the room is empty now” are inconsistent). But, one might argue, the existence of a reason for the room to be empty now does not entail that the room is empty now!<sup>68</sup> One can avoid this puzzling result by rejecting (as I do, for independent reasons) the assumption that, necessarily, one cannot change the past or present. But maybe the result is not so puzzling after all: reasoning contrapositively, if the room is not empty now, maybe it does follow that no fact (now) supports “let it be the case that the room is empty now”.

## 7. Conclusion

The general definition of argument validity that I proposed in this paper is supported by several considerations. (1) The definition is *general*: it provides a unified account of validity for pure, mixed-premise, and cross-species declarative and imperative arguments (see Table 1). (2) The definition is *usable*: it enables one to decide—via the theorems that I proved—whether specific arguments are valid.<sup>69</sup> (3) The definition is *useful*: it satisfies transmission both of meriting pro tanto and of meriting all-things-considered endorsement (see §2.2.3). (4) The definition is *formally acceptable*: it satisfies reflexivity and transitivity.<sup>70</sup> (5) The definition is *intuitively ac-*

---

<sup>68</sup> The above remarks are also relevant to an imperative variant of “Chisholm’s paradox” (Chisholm 1963). Consider the argument (inspired by Prakken & Sergot 1996) from “let it be the case that the room is empty”, “if the room is empty, let it be the case that the alarm is on”, “if the room is not empty, let it be the case that the alarm is off (i.e., not on)”, and “the room is not empty” to “let it be the case that the alarm is both on and off”. It is paradoxical to claim that this argument is valid: its conclusion is inconsistent, but its four premises look jointly consistent. However, if the Equivalence Assumption is true and it is necessary that one cannot change the present, then the conjunction of the three imperative premises—which, by Definition 5, is “let it be the case that the room is empty and the alarm is on”—is inconsistent with the declarative premise (“the room is not empty”), so one does not escape the paradoxical result that the above argument is valid. (Much more can be said about this paradox; cf. Carmo & Jones 2002.)

<sup>69</sup> Although the definition is not immediately *reductive* (i.e., it does not immediately reduce the validity of an argument to the validity of a pure declarative argument), it is usable mainly because the equivalence theorems that I proved do reduce the validity of (1) cross-species imperative arguments, (2) cross-species declarative arguments, and (3) mixed-premise declarative arguments to the validity of pure declarative arguments. The definition is not *fully* usable, however, given the lack of an equivalence theorem for mixed-premise imperative arguments. (Recall, for example, that I have no proof that Argument 40 is not valid; see the end of note 57.) It is an open question whether there is an equivalence theorem reducing the validity of a mixed-premise imperative argument to the validity of *two* pure declarative arguments (just as the equivalence theorem in note 48 reduces the (w/w) validity of a *pure* imperative argument to the validity of two pure declarative arguments).

<sup>70</sup> It can also be shown that w/w (but not s/s) entailment satisfies *monotonicity* (if  $\Gamma$  w/w entails  $A$  and  $\Gamma \subseteq \Delta$ , then  $\Delta$  w/w entails  $A$ ; cf. note 54) and *projection* (if  $A \in \Gamma$ , then  $\Gamma$  w/w entails  $A$ ). ( $\Gamma$  and  $\Delta$  are any non-empty sets of propositions or prescriptions or both, and  $A$  is any proposition or prescription.) Moreover, it can be shown that w/w entailment satisfies *strong cut* (if  $\Gamma$  w/w entails  $A$  and  $\Delta \cup \{A\}$  w/w entails  $A'$ , then  $\Gamma \cup \Delta$  w/w entails  $A'$ ) if the condition holds that, necessarily, every fact that weakly supports two prescriptions also weakly supports their conjunction. (It is not clear whether this condition holds; it is stronger than result (2) of note 49. Cf. Vranas 2011: 398 n. 38. Strong cut fails for s/s entailment.) In contrast to reflexivity and transitivity, I do not consider monotonicity, projection, and strong cut necessary for formal acceptability (see Vranas 2011: 438 n. 69).

*ceptable*: it yields intuitively acceptable results concerning the validity of a wide variety of arguments. (6) The definition is *principled*: it is motivated by considerations that go beyond a mere appeal to intuitions. (7) The definition is *in harmony with previous work*: it yields as special cases both the standard definition of validity for pure declarative arguments and my previously defended definition of validity for pure imperative arguments.

In this paper I did not deal with *syntactic* aspects of argument validity. The natural next steps are to introduce a formal language and a proof procedure, and to prove the soundness and the completeness of the proof procedure with respect to a semantics based on the General Definition. These are the main tasks of a sequel to this paper.

### **Appendix: Alternative definitions of argument validity**

In this appendix I briefly examine several alternative definitions of argument validity that have been proposed in the literature or in discussion.

(1) Material conditionals. For any prescription *I*, let its *corresponding* proposition be the material conditional whose antecedent is the context of *I* and whose consequent is the satisfaction proposition of *I*. For any argument *A*, let its *corresponding* pure declarative argument be the argument that one gets by replacing those premises of *A* that are prescriptions with their corresponding propositions, and also replacing the conclusion of *A*, if it is a prescription, with its corresponding proposition. Following Clarke (1970: 103), one might propose that an argument *A* is valid exactly if (a) its corresponding pure declarative argument is valid (cf. Smart 1984: 17; Pigden 2011: 4-5) and (b) *A* satisfies the following *Principle of Mood Constancy*: “The constituent elements of a mixed inference must be in the same mood for every occurrence within the inference” (Clarke 1970: 101). This proposal has several problems. (i) Whether an argument satisfies the Principle of Mood Constancy can depend on how the argument is formulated: the imperative sentences “if you kill, kill” and “if you kill, steal or don’t steal” express the same prescription (namely the prescription whose satisfaction proposition is the proposition that you kill and whose violation proposition is impossible), but the argument from that prescription to itself violates the Principle of Mood Constancy if the prescription is expressed by the former sentence and satisfies the principle if the prescription is expressed by the latter sentence. (ii) Arguments 4, 12, 30, and 32 are valid, but their corresponding pure declarative arguments are not valid. (iii) The argument from “kill” and “you kill” to “you kill” is valid (cf. MacKay 1971: 92, 94-5; Morscher & Zecha 1971: 211), and so is (more interestingly) Argument 25, but both arguments violate the Principle of Mood Constancy. (iv) Arguments 10, 21, and 38 are not valid, but they satisfy (at least as I formulated them) the principle of Mood Constancy, and their corresponding pure declarative arguments are valid.

(2) Deontic propositions. One might propose that an argument is valid exactly if its corresponding *deontic* argument is valid (cf. Charlow 2014; Kaufmann 2012), the corresponding deontic argument being defined as in (1) above but by replacing any prescription (not with a material conditional, but rather) with the deontic proposition that the satisfaction proposition of the prescription is all-things-considered obligatory given the context of the prescription. A first problem with this proposal is that many deontic arguments correspond to a given argument, depending on whether obligatoriness is understood morally, legally, epistemically, and so on. This problem is not decisive: there are also many kinds of *relativized* validity (see note 13), and one might claim that an argument is valid relative to *moral* (legal, epistemic, etc.) support exactly if its corresponding *moral* (legal, epistemic, etc.) deontic argument is valid. A second problem with the



proposal is more serious, however: the argument from “marry me” to “it is all-things-considered obligatory for you to marry me” is not valid, but its corresponding deontic arguments are trivially valid (and similarly for Argument 14). Similar remarks apply if one replaces a prescription (not with a deontic proposition, but rather) with the proposition that some fact undefeatedly supports the prescription.

(3) Inconsistency. By analogy with pure declarative arguments, one might propose that an argument is valid exactly if the set that consists of the premises and the negation of the conclusion of the argument is *inconsistent*, in the sense that the conjunction of the propositions in the set is inconsistent with the conjunction of the prescriptions in the set (or, if there are only propositions or only prescriptions in the set, their conjunction is inconsistent; cf. note 40). A first problem with this proposal is that the proposed implication from inconsistency to validity fails for pure imperative arguments (see Vranas 2011: 445), for cross-species arguments (see the paragraph after Argument 30 in §5), and for mixed-premise arguments (see note 44). A second problem with the proposal is that the proposed implication from validity to inconsistency fails for pure imperative arguments; for example, the argument from “sing” to “if you dance, sing” is valid (cf. Argument 39) but the conjunction of the prescriptions “sing” and “if you dance, don’t sing” is consistent (the conjunction is “sing but don’t dance”, so it is not necessarily violated). On the other hand, the implication from validity to inconsistency does hold for cross-species arguments (see §5), for mixed-premise declarative arguments (see note 44), and for mixed-premise imperative arguments with unconditional conclusions (as one can show by a reasoning similar to my proof of Theorem 6 in note 50).

(4) Undefeated sustaining. One might propose that an argument is valid exactly if, necessarily, every fact that *undefeatedly* sustains every premise of the argument also *undefeatedly* sustains the conclusion of the argument. A first problem with this alternative definition is that, as far as I can see, it does not satisfy transmission of meriting pro tanto endorsement (see D2JP in §2.2.3 and note 12; the definition does satisfy transmission of meriting all-things-considered endorsement). One can show that every argument which is valid according to the General Definition is also valid according to the alternative definition, and that the two definitions are equivalent for cross-species imperative arguments. However, the two definitions are not equivalent for declarative or mixed-premise imperative arguments. For example, the argument from “marry me” to “possibly, there is an *undefeated* reason for you to marry me” (cf. Argument 12) is not valid according to the General Definition but is valid according to the alternative definition—and I take this to be a second problem with the alternative definition. One might reply that the above argument *is* valid according to the General Definition on the plausible assumption that, necessarily, if some fact possibly supports any given prescription, then some fact possibly *undefeatedly* supports the prescription. Indeed, one can show that on this assumption the two definitions are equivalent for cross-species declarative arguments. (One can also show that on a related assumption, namely an analog of Assumption 1 in Vranas 2011: 433, the two definitions are equivalent for pure imperative arguments.) Nevertheless, the assumption might be considered controversial, so I think that the General Definition is preferable to the alternative definition. One might alternatively propose that an argument is valid exactly if, necessarily, every fact that *indefeasibly* (see §2.2.3) sustains every premise of the argument also *indefeasibly* sustains the conclusion of the argument. This proposal turns out to have the (to mind mistaken) consequence that Argument 14 is valid.

(5) Other definitions. (a) Parsons (2013) defines the *content* of, e.g., “if you run, smile” as the set of ordered pairs of possible worlds  $\langle w, w' \rangle$  such that either “you run” is false at  $w$  or “you smile” is true at  $w'$  (and defines similarly the contents of, e.g., “you run” and “smile”), and proposes that an argument is valid exactly if the intersection of the contents of its premises is a subset of the content of its conclusion. According to this proposal, however, the argument from “if you run, smile” to “if you run, run and smile” is not valid, so reflexivity is violated (since the imperative sentences “if you run, smile” and “if you run, run and smile” express the *same* prescription). Another problem is that, according to the proposal, cross-species arguments like Argument 4 and Argument 12 are not valid. (b) Finally, Sosa (1970: 219-20) proposes a definition of validity for mixed-premise imperative arguments which turns out to have the (to my mind mistaken) consequences that Argument 38 is valid and that neither Argument 32 nor Argument 34 is valid.

### REFERENCES

- Adler, Melvin J. (1980). *A pragmatic logic for commands*. Amsterdam: John Benjamins.
- Åqvist, Lennart (1967). [Review of Rescher 1966.] *Philosophical Books*, 8, 18-23.
- Barker, Stephen, & Jago, Mark (2012). Being positive about negative facts. *Philosophy and Phenomenological Research*, 85, 117-138.
- Belzer, Marvin, & Loewer, Barry (1994). Hector meets 3-D: A diaphilosophical epic. In J. E. Tomberlin (Ed.), *Philosophical Perspectives: Vol. 8. Logic and language* (pp. 389-414). Atascadero, CA: Ridgeview.
- Bennett, Jonathan F. (1970). [Review of articles on imperative inference.] *The Journal of Symbolic Logic*, 35, 314-318.
- Bergström, Lars (1962). *Imperatives and ethics: A study of the logic of imperatives and of the relation between imperatives and moral judgments*. Stockholm: Stockholm University.
- Bergström, Lars (1970). Imperatives and contradiction. *Mind*, 79, 421-424.
- Bohnert, Herbert G. (1945). The semiotic status of commands. *Philosophy of Science*, 12, 302-315.
- Boisvert, Daniel, & Ludwig, Kirk (2006). Semantics for nondeclaratives. In E. Lepore & B. C. Smith (Eds.), *The Oxford handbook for the philosophy of language* (pp. 864-892). New York: Oxford University Press.
- Borchardt, Edward (1979). The semantics of imperatives. *Logique et Analyse*, 22, 191-205.
- Borowski, E. J. (1977). A Pyrrhic defense of moral autonomy. *Philosophy*, 52, 455-466.
- Burgess, John P. (1999). Which modal logic is the right one? *Notre Dame Journal of Formal Logic*, 40, 81-93.
- Burgess, John P. (2003). Which modal logics are the right ones (for logical necessity)? *Theoria: An International Journal for Theory, History and Foundations of Science*, 18, 145-158.
- Carlson, Erik (2000). Incompatibilism and the transfer of power necessity. *Noûs*, 34, 277-290.
- Carmo, José, & Jones, Andrew J. I. (2002). Deontic logic and contrary-to-duties. In D. M. Gabbay & F. Guenther (Eds.), *Handbook of philosophical logic* (2nd ed., Vol. 8, pp. 265-343). Dordrecht: Kluwer.
- Castañeda, Hector-Neri (1958). Imperatives and deontic logic. *Analysis*, 19, 42-48.
- Castañeda, Hector-Neri (1960a). Imperative reasonings. *Philosophy and Phenomenological Research*, 21, 21-49.
- Castañeda, Hector-Neri (1960b). Outline of a theory on the general logical structure of the language of action. *Theoria: A Swedish Journal of Philosophy*, 26, 151-182.
- Castañeda, Hector-Neri (1963). Imperatives, decisions, and ‘oughts’: A logico-metaphysical investigation. In H.-N. Castañeda & G. Nakhnikian (Eds.), *Morality and the language of conduct* (pp. 219-299). Detroit: Wayne State University Press.
- Castañeda, Hector-Neri (1968). Actions, imperatives, and obligations. *Proceedings of the Aristotelian Society*, 68, 25-48.
- Castañeda, Hector-Neri (1974). *The structure of morality*. Springfield, IL: Charles C. Thomas.
- Castañeda, Hector-Neri (1975). *Thinking and doing: The philosophical foundations of institutions*. Dordrecht: Reidel.
- Charlow, Nate (2014). Logic and semantics for imperatives. *Journal of Philosophical Logic*, 43, 617-664.
- Chaturvedi, Abha (1980). In defence of ‘satisfaction-logic’ of commands. *Indian Philosophical Quarterly*, 7, 471-481.
- Chisholm, Roderick M. (1963). Contrary-to-duty imperatives and deontic logic. *Analysis*, 24, 33-36.
- Clark-Younger, Hannah, & Girard, Patrick (2013). Imperatives and entailment. Unpublished.
- Clarke, David S., Jr. (1970). Mood constancy in mixed inferences. *Analysis*, 30, 100-103.
- Clarke, David S., Jr. (1973). *Deductive logic: An introduction to evaluation techniques and logical theory*. Carbondale, IL: Southern Illinois University Press.
- Clarke, David S., Jr. (1975). The logical form of imperatives. *Philosophia: Philosophical Quarterly of Israel*, 5, 417-427.
- Clarke, David S., Jr. (1985). *Practical inferences*. London: Routledge & Kegan Paul.
- Dubislav, Walter (1937). Zur Unbegründbarkeit der Forderungssätze. *Theoria: A Swedish Journal of Philosophy*, 3, 330-342.
- Duncan-Jones, Austin (1952). Assertions and commands. *Proceedings of the Aristotelian Society*, 52, 189-206.
- Espersen, Jon (1967). The logic of imperatives. *Danish Yearbook of Philosophy*, 4, 57-112.

- Finch, Alicia, & Warfield, Ted A. (1998). The *Mind* argument and libertarianism. *Mind*, 107, 515-528.
- Frey, Gerhard (1957). Idee einer Wissenschaftslogik: Grundzüge einer Logik imperativer Sätze. *Philosophia Naturalis*, 4, 434-491.
- Geach, Peter T. (1958). Imperative and deontic logic. *Analysis*, 18, 49-56.
- Gensler, Harry J. (1990). *Symbolic logic: Classical and advanced systems*. Englewood Cliffs, NJ: Prentice-Hall.
- Gibbard, Allan (2005). Truth and correct belief. In E. Sosa & E. Villanueva (Eds.), *Philosophical Issues: Vol. 15. Normativity* (pp. 338-350). Oxford: Blackwell.
- Gibbons, P. C. (1960). Imperatives and indicatives. *Australasian Journal of Philosophy*, 38, 107-119 & 207-217.
- Gombay, André (1967). What is imperative inference? *Analysis*, 27, 145-152.
- Greenspan, Patricia S. (1975). Conditional oughts and hypothetical imperatives. *The Journal of Philosophy*, 72, 259-276.
- Grelling, Kurt (1939, January). Zur Logik der Sollsaetze. *Unity of Science Forum*, pp. 44-47.
- Grice, Herbert P. (1989). Presupposition and conversational implicature. In H. P. Grice, *Studies in the way of words* (pp. 269-282). Cambridge, MA: Harvard University Press. (Originally published 1981.)
- Grue-Sörensen, K. (1939). Imperativsätze und Logik. Begegnung einer Kritik. *Theoria: A Swedish Journal of Philosophy*, 5, 195-202.
- Hamblin, Charles L. (1987). *Imperatives*. Oxford: Blackwell.
- Hansen, Jörg (2008). *Imperatives and deontic logic: On the semantic foundations of deontic logic*. Doctoral dissertation, University of Leipzig, Germany.
- Hare, Richard M. (1952). *The language of morals*. Oxford: Clarendon Press.
- Hare, Richard M. (1967). Some alleged differences between imperatives and indicatives. *Mind*, 76, 309-326.
- Hare, Richard M. (1977). Geach on murder and sodomy. *Philosophy*, 52, 467-472.
- Hare, Richard M. (1979). Universal and past-tense prescriptions: A reply to Mr. Ibberson. *Analysis*, 39, 161-165.
- Harman, Gilbert (1972). Is modal logic logic? *Philosophia: Philosophical Quarterly of Israel*, 2, 75-84.
- Harnish, Robert M. (2006). Mood and inference. *Research in Language*, 4, 57-75.
- Harrison, Jonathan (1991). Deontic logic and imperative logic. In P. T. Geach (Ed.), *Logic and ethics* (pp. 79-129). Dordrecht: Kluwer.
- Heller, Joseph (1994). *Catch-22*. New York: Simon & Schuster. (Originally published 1961.)
- Hoche, Hans-Ulrich (1995). Universal prescriptivism revisited; or: The analyticity of the golden rule. *Revista Filosófica de Coimbra*, 4, 337-363.
- Holdcroft, David (1978). *Words and deeds: Problems in the theory of speech acts*. Oxford: Clarendon Press.
- Horty, John F. (1994). Moral dilemmas and nonmonotonic logic. *Journal of Philosophical Logic*, 23, 35-65.
- Horty, John F. (1997). Nonmonotonic foundations for deontic logic. In D. Nute (Ed.), *Defeasible deontic logic* (pp. 17-44). Dordrecht: Kluwer.
- Horty, John F. (2012). *Reasons as defaults*. New York: Oxford University Press.
- Huemer, Michael (2000). Van Inwagen's consequence argument. *The Philosophical Review*, 109, 525-544.
- Jørgensen, Jørgen (1938). Imperatives and logic. *Erkenntnis*, 7, 288-296.
- Jørgensen, Jørgen (1969). Imperatives and logic. *Danish Yearbook of Philosophy*, 6, 9-17. (Reprint of Jørgensen 1938.)
- Juárez-Paz, Rigoberto (1959). Reasons, commands and moral principles. *Logique et Analyse*, 2, 194-205.
- Katz, Jerrold J. (1977). *Propositional structure and illocutionary force: A study of the contribution of sentence meaning to speech acts*. New York: Thomas Y. Crowell.
- Kaufmann, Magdalena (2012). *Interpreting imperatives*. New York: Springer.
- Kelsen, Hans (1979). *Allgemeine Theorie der Normen* (K. Ringhofer & R. Walter, Eds.). Vienna: Manz.
- Kelsen, Hans (1991). *General theory of norms* (M. Hartney, Trans.). Oxford: Clarendon Press. (Translation of Kelsen 1979.)
- Kolodny, Niko (2011). Instrumental reasons. In D. Star (Ed.), *The Oxford handbook of reasons and normativity* (forthcoming).
- Kolodny, Niko, & MacFarlane, John (2010). Ifs and oughts. *The Journal of Philosophy*, 107, 115-143.
- Lalande, André (1963). *La raison et les normes: Essai sur le principe et sur la logique des jugements de valeur* (2nd ed.). Paris: Hachette.
- Ledent, Adrien (1942). Le statut logique des propositions impératives. *Theoria: A Swedish Journal of Philosophy*, 8, 262-271.
- Lemmon, Edward J. (1965). Deontic logic and the logic of imperatives. *Logique et Analyse*, 8, 39-71.
- MacFarlane, John (2009). Logical constants. In *Stanford encyclopedia of philosophy (fall 2009 edition)*. URL = <<http://plato.stanford.edu/archives/fall2009/entries/logical-constants/>>. (Originally published 2005.)
- MacIntyre, Alasdair (1965). Imperatives, reasons for action, and morals. *The Journal of Philosophy*, 62, 513-524.
- MacKay, Alfred F. (1969). Inferential validity and imperative inference rules. *Analysis*, 29, 145-156.
- MacKay, Alfred F. (1971). The principle of mood constancy. *Analysis*, 31, 91-96.
- Mavrodes, George I. (1968). On deriving the normative from the nonnormative. *Papers of the Michigan Academy of Science, Arts, and Letters*, 53, 353-365.
- McArthur, Robert P., & Welker, David (1974). Non-assertoric inference. *Notre Dame Journal of Formal Logic*, 15, 225-244.
- McKay, Thomas J., & Johnson, David (1996). A reconsideration of an argument against compatibilism. *Philosophical Topics*, 24, 113-122.
- Molnar, George (2000). Truthmakers for negative truths. *Australasian Journal of Philosophy*, 78, 72-86.

- Moore, George E. (1942). A reply to my critics. In P. A. Schilpp (Ed.), *The philosophy of G. E. Moore* (pp. 535-677). Evanston, IL: Northwestern University.
- Moore, George E. (1944). Russell's "Theory of descriptions". In P. A. Schilpp (Ed.), *The philosophy of Bertrand Russell* (pp. 175-225). New York: Tudor.
- Moore, George E. (1993). Moore's paradox. In T. Baldwin (Ed.), *G. E. Moore: Selected writings* (pp. 207-212). London: Routledge.
- Moritz, Manfred (1954). Der praktische Syllogismus und das juristische Denken. *Theoria: A Swedish Journal of Philosophy*, 20, 78-127.
- Morscher, Edgar (1972). Poincaré's Rule (oder: Wie aus einer schlechten Übersetzung eine Legende entsteht). *Journal of the History of Philosophy*, 10, 350-353.
- Morscher, Edgar (1974). Das Sein-Sollen-Problem logisch betrachtet: Eine Übersicht über den gegenwärtigen Stand der Diskussion. *Conceptus*, 8(25), 5-29.
- Morscher, Edgar, & Zecha, Gerhard (1971). Clarke's principle of mood constancy. *Philosophia: Philosophical Quarterly of Israel*, 1, 209-217.
- Moutafakis, Nicholas J. (1975). *Imperatives and their logics*. New Delhi: Sterling.
- Mulligan, Kevin, & Correia, Fabrice (2009). Facts. In *Stanford encyclopedia of philosophy (spring 2009 edition)*. URL = <<http://plato.stanford.edu/archives/spr2009/entries/facts/>>. (Originally published 2007.)
- Nute, Donald, & Yu, Xiaochang (1997). Introduction. In D. Nute (Ed.), *Defeasible deontic logic* (pp. 1-16). Dordrecht: Kluwer.
- Parsons, Josh (2012). Cognitivism about imperatives. *Analysis*, 72, 49-54.
- Parsons, Josh (2013). Command and consequence. *Philosophical Studies*, 164, 61-92.
- Pietroski, Paul (2014). Logical form. In *Stanford encyclopedia of philosophy (fall 2014 edition)*. URL = <<http://plato.stanford.edu/archives/fall2014/entries/logical-form/>>. (Originally published 1999.)
- Pigden, Charles R. (2011). Is George a traitor? Geach's problem and imperative consequence. Unpublished.
- Pigden, Charles R. (2012). Queerness reconfigured. Unpublished.
- Poincaré, Henri (1913). *Dernières Pensées*. Paris: Flammarion.
- Pollock, John L. (1970). The structure of epistemic justification. In N. Rescher (Ed.), *Studies in the theory of knowledge* (American Philosophical Quarterly monograph series, no. 4, pp. 62-78). Oxford: Blackwell.
- Pollock, John L. (1974). *Knowledge and justification*. Princeton, NJ: Princeton University Press.
- Pollock, John L. (1987). Defeasible reasoning. *Cognitive Science*, 11, 481-518.
- Popper, Karl R. (1945). *The open society and its enemies: Vol. 1. The spell of Plato*. London: Routledge.
- Popper, Karl R. (1948). What can logic do for philosophy? *The Aristotelian Society: Supplementary Volume*, 22, 141-154.
- Prakken, Henry, & Sergot, Marek (1996). Contrary-to-duty obligations. *Studia Logica*, 57, 91-115.
- Prior, Arthur N. (1949). *Logic and the basis of ethics*. Oxford: Clarendon Press.
- Ramírez, Miguel P. (2003). *Formal pragmatic model for imperatives interpretation*. Doctoral dissertation, University of Essex.
- Rand, Rose (1939). Logik der Forderungssätze. *Revue Internationale de la Théorie du Droit*, 1, 308-322.
- Rand, Rose (1962). The logic of demand-sentences. *Synthese*, 14, 237-254. (Translation of Rand 1939.)
- Rescher, Nicholas (1966). *The logic of commands*. London: Routledge & Kegan Paul.
- Rodriguez-Pereyra, Gonzalo (2006). Truthmaking, entailment, and the conjunction thesis. *Mind*, 115, 957-982.
- Ross, Alf (1941). Imperatives and logic. *Theoria: A Swedish Journal of Philosophy*, 7, 53-71.
- Ross, Alf (1944). Imperatives and logic. *Philosophy of Science*, 11, 30-46. (Reprint of Ross 1941.)
- Sellars, Wilfrid (1956). Imperatives, intentions and the logic of "ought". *Methodos*, 8, 227-268.
- Smart, John J. C. (1984). *Ethics, persuasion and truth*. London: Routledge & Kegan Paul.
- Sosa, Ernest (1964). *Directives: A logico-philosophical inquiry*. Doctoral dissertation, University of Pittsburgh.
- Sosa, Ernest (1966). Imperatives and referential opacity. *Analysis*, 27, 49-52.
- Sosa, Ernest (1967). The semantics of imperatives. *American Philosophical Quarterly*, 4, 57-64.
- Sosa, Ernest (1970). On practical inference, with an excursus on theoretical inference. *Logique et Analyse*, 13, 215-230.
- Speak, Daniel (2011). The consequence argument revisited. In R. Kane (Ed.), *The Oxford handbook of free will* (2nd ed., pp. 115-130). New York: Oxford University Press.
- Stalley, Richard F. (1972). Intentions, beliefs, and imperative logic. *Mind*, 81, 18-28.
- Tammelo, Ilmar (1975). The logic of demands in legal thought. *ITA Humanidades*, 11, 34-42.
- Turnbull, Robert G. (1960). Imperatives, logic, and moral obligation. *Philosophy of Science*, 27, 374-390.
- Vanderveken, Daniel (1990). *Meaning and speech acts: Vol. 1. Principles of language use*. New York: Cambridge University Press.
- Vetter, Hermann (1971). Deontic logic without deontic operators. *Theory and Decision*, 2, 67-78.
- Vranas, Peter B. M. (2005). Do cry over spilt milk: Possibly you can change the past. *The Monist*, 88, 370-387.
- Vranas, Peter B. M. (2007). I ought, therefore I can. *Philosophical Studies*, 136, 167-216.
- Vranas, Peter B. M. (2008). New foundations for imperative logic I: Logical connectives, consistency, and quantifiers. *Noûs*, 42, 529-572.
- Vranas, Peter B. M. (2010). In defense of imperative inference. *Journal of Philosophical Logic*, 39, 59-71.
- Vranas, Peter B. M. (2011). New foundations for imperative logic: Pure imperative inference. *Mind*, 120, 369-446.

- Vranas, Peter B. M. (2013). Imperatives, logic of. In H. LaFollette (Ed.), *International encyclopedia of ethics* (Vol. 5, pp. 2575-2585). Oxford: Blackwell.
- Warmbröd, Ken (1999). Logical constants. *Mind*, 108, 503-538.
- Warnock, Geoffrey (1976). Imperatives and meaning. In H. D. Lewis (Ed.), *Contemporary British philosophy: Personal statements* (4th series, pp. 292-304). London: Allen & Unwin.
- Wedeking, Gary A. (1969). *A critical examination of command logic*. Doctoral dissertation, Washington University, Saint Louis, Missouri.
- Weinberger, Ota (1972). Bemerkungen zur Grundlegung der Theorie des juristischen Denkens. In H. Albert, N. Luhman, W. Maihofer, & O. Weinberger (Eds.), *Jahrbuch für Rechtssoziologie und Rechtstheorie: Vol. 2. Rechtstheorie als Grundlagenwissenschaft der Rechtswissenschaft* (pp. 134-161). Düsseldorf: Bertelsmann Universitätsverlag.
- Weinberger, Ota (1976). Poincaré's Rule (oder: Ein bisschen Hermeneutik, Herr Morscher!). *Journal of the History of Philosophy*, 14, 356-358.
- Weinberger, Ota (1981). *Normentheorie als Grundlage der Jurisprudenz und Ethik: Eine Auseinandersetzung mit Hans Kelsens Theorie der Normen*. Berlin: Duncker & Humblot.
- Williams, Bernard A. O. (1966). Consistency and realism. *The Aristotelian Society: Supplementary Volume*, 40, 1-22.
- Zellner, Harold M. (1971). *The logic of imperatives*. Doctoral dissertation, The University of Miami, Coral Gables, Florida.