Knowing How To Do Semantics

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written by

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Chapter 1

Introduction

Stanley and Williamson's 2001 article "Knowing How" introduced a new way of thinking about an old question in epistemology. Their unique perspective is developed in full detail by Stanley in his 2011 book *Know How*. The question they address, "What is knowledge-how?", can be uncontroversially traced to Gilbert Ryle's *The Concept of Mind*.[1]

I am interested in the particular account of knowledge-how that emerges from Stanley's work – I will focus on his theory over the less detailed and quite similar sketch co-authored with Williamson – because it is at the interface of philosophy and semantics. In the larger space consisting of all accounts of knowledge-how, I will show that Stanley's account suggests further investigation of knowledge-how along interesting and potentially fruitful directions.

The broadest reading of this thesis would use this example to gain a better understanding of how semantics relates to philosophy in general practice. With respect to this reading, the nature of such a relation depends on and determines how each discipline is understood. As I will discuss, traditional metaphysics, ontology, and epistemology still feature prominently in Stanley's theory. What is distinctively *semantic* about his approach is that it is primarily motivated by semantic rather than traditional philosophical concerns. I will make some speculative remarks with respect to the relationship between linguistic theory and philosophy at the end of this thesis. Most of what follows is not this general, however. It focuses quite specifically on the methodology of Stanley's theory of knowledge-how, and is therefore perhaps well read as a case study. With this in mind, I will now discuss some of the relevant philosophical background.

1.1 Ryle and Ginet

As I mentioned in the last section, Stanley's theory is a recent addition to a discussion of knowledge-how that is commonly referred back to the work of Gilbert

[1] It can probably be traced back further than that; a history in the Western philosophical tradition could start with *technē*, *epistemē*, and the ancient Greeks.

Ryle. Ryle's views on knowledge-how retain widespread popularity among analytic philosophers despite the fact that the behaviourist theory of which it was a part has long since gone out of fashion in linguistics.[2] For Ryle, knowledge-how is a part of a bigger philosophical project. In discussing it, his primary interest is to establish whether or not knowledge-how can be expressed as a proposition – whether it is a species of *propositional knowledge*. A satisfactory resolution of Ryle's problem, therefore, depends both on an account of knowledge-how and on an account of propositional knowledge.

Ryle's defines his conception of knowledge-how in contrast with the *intellectualist*. This is someone who thinks that knowledge-how is propositional knowledge. It does not take too much creativity to name any view that rejects this reduction *anti-intellectualist*. Ryle supported his anti-intellectualism by a famous regress; the following impressively succinct form features in (Ryle 1949 : 19).

> The crucial objection to the intellectualist legend is this. The consideration of propositions is itself an operation the execution of which can be more or less intelligent, less or more stupid. But if, for any operation to be intelligently executed, a prior theoretical operation had first to be performed and performed intelligently, it would be a logical impossibility for anyone ever to break into the circle.

In order for the intellectualist to exercise any piece of knowledge how, Ryle argues, they must consider the propositional knowledge on which their knowledge-how is based. This itself is a skilled act. By the intellectualist's hypothesis, then, considering a proposition itself banks on propositional information. But considering these propositions then requires recourse to further propositions, and considering those forces us to consider even more propositions. In this way Ryle forms the infinite regress.

The intuition behind Stanley's account of knowledge-how can be traced to Carl Ginet's refutation of Ryle's regress argument. Ginet's own words are a brief but convincing argument against Ryle; see the following passage of (Ginet 1975 : 7).[3]

> All that [Ryle] actually brings out, as far as I can see, is that the exercise (or manifestation) of one's knowledge of how to do a certain sort of thing need not and often does not involve any separate mental operation of considering propositions and inferring from them instructions to oneself. But the same thing is as clearly true of one's manifestations of *knowledge that* certain propositions are

[2] See (Stanley & Williamson 2001 : 1) for some sociological discussion on the popularity of Ryle's perspective on knowledge-how.

[3] Stanley and Williamson credit Ginet and so can be said to have been quite directly inspired by this idea.

> true, especially one's knowledge of truths that answer questions of the form "How does one...?" or "How should one...?" I exercise (or manifest) my knowledge *that* one can get the door open by turning the knob and pushing it (as well as my knowledge *that* there is a door there) by performing that operation quite automatically as I leave the room; and I may do this, of course, without formulating (in my mind or out loud) that proposition or any other relevant proposition.

Ginet argues here that knowledge can be manifested without necessitating a separate act of consulting some propositions or instructions. This passage also makes clear that whether knowledge is knowledge-how or knowledge-that is quite independent of whether or not its manifestation requires the prior act of consulting some propositions. The example Ginet gives of propositional knowledge is also an example of knowledge-how: I know how to open the door because I know that turning the doorknob is a way to open the door.

Notice that knowledge-how to open a door can be described as knowledge of a proposition that contains a way of opening the door.[4] Stanley generalizes this to the slogan: knowledge-how to F is knowledge of a proposition that contains a way to F. A natural objection is the following. Turning a doorknob is a very concrete example of a way to do something. An abstract way to do something, on the other hand, is considerably more difficult to conceptualize. In the following chapters, I will demonstrate how the semantic methods Stanley uses provides this conceptual ground.

1.2 The thesis

The first move Stanley makes is to change the subject: instead of "What is knowledge-how?", he asks "What do ascriptions like 'X knows how to F' mean?". For clarity, let's say the first question is *phenomenal* and the second is *ascriptional*. The slogan "meaning is use" motives this change in perspective to a degree.[5] Such a conception suggests that to understand a word requires an understanding of how that word is used in everyday language.

I will note some advantages of changing the subject in this way as they come up in later sections. To answer the ascriptional question, Stanley turns to the formal semantics of questions. It is at this point where comparison with alternative formal semantic theories of questions becomes a reasonable pursuit.[6]

An important complicating factor here is *authority*. One way to read Stanley's use of semantics is as the incorporation of insights from an empirical scientific discipline into epistemology. If that is the case, then perhaps his arguments

[4] What "contains" means depends on what theory of propositions we adopt. This will become clear in the next chapter.

[5] This view is often identified with Ludwig Wittgenstein's later work; see, for example, section 43 of the *Philosophical Investigations*.

[6] Jonathan Ginzburg's work plays a peripheral but nonetheless significant role in this thesis. I only focus on those points which are relevant and comparable to aspects of Stanley's theory.

ought to be considered differently than they would had they not been motivated by empirical science. It is well beyond my means to answer whether or not the authority of sources a work references does and/or should correlate with its acceptance among the community it is directed towards. While understanding Stanley's methodology may be give some perspective on this grand question, it is also useful for simply putting his ideas in context.

Although I will not comment directly on whether the formal semantic methods at play here are empirical, I will not take any assumptions made for granted as "obvious", "natural", or given by empirical study. I mention this because there are portions of Stanley's text which read as if he intends his methods to be taken this way:

> Perhaps we have a single concept for propositional knowledge and [knowledge how], but science will reveal that in fact (say) propositional knowledge ascriptions and ascriptions of knowing-where or knowing-who are very different in kind. In short, perhaps the situation is similar to what happened with the concept corresponding to the expression "jade". Our single concept turned out to be a concept corresponding to two very different kinds, jadeite and nephrite. Our concept of knowledge turns out upon further investigation to be fractured.

It seems, from this quote, that Stanley hopes to apply "science" to this problem in a way that resembles the science by which Damour distinguished jadeite from nephrite. [7] I cannot say whether or not Stanley would agree with this much (he may not commit so strongly to an analogy!). What is relevant for my analysis is that this analogy suggests an interesting question. Assume that there are philosophical contexts where analyses like Damour's are authoritative. Do the formal tools Stanley employs exert similar authority in his discussion of knowledge-how? What light does this shed on the use of semantics in philosophy more generally?

The picture that emerges from my treatment of Stanley's work casts formal semantics as a medium in which to do epistemology rather than an authority to decide epistemological problems.

This thesis can be thought of as the conjunction of positive and a negative components. The positive view is of formal semantics as a medium for philosophy. As I mentioned earlier, we will see that traditional philosophical reasoning still occurs in Stanley's work, but does so with respect to a set of concerns which is primarily linguistic.

The negative view goes against the idea of formal semantics as an authority to decide philosophical problems. There are two main supports for this view.

[7] Alexis Damour (1808-1902), French mineralogist. There is a significant list of minerals he is credited with discovering. Among his many achievements is the distinction of jadeite from nephrite by the analysis of their chemical composition.

One reason is that Stanley adopts the methods he does freely, rather than being compelled to do so by the facts.[8] Arguments for the positive component of this thesis, which frame semantics as a medium for philosophy, are also relevant evidence for this point. Another reason is that a central notion in Stanley's theory, the *semantic content* of knowledge-how ascriptions, is an idealized rather than an abstract construction. My use of the terms *abstraction* and *idealization* are owed to Martin Stokhof and Michiel van Lambalgen. I will discuss this in more detail in chapter 4.

[8] Indeed, it is not even clear what counts as a fact. As Martin Stokhof has written in "Intuitions and Competence in Formal Semantics", the intuitions of native speakers are often taken to be both the object of and data for semantic theory. Yet there are other potential sources of data: the everyday practice of speakers, for instance. This is touched upon tangentially, as its omission can be traced to where the line is drawn between competence and performance.

Chapter 2

Ascriptions of knowledge-how

Before proceeding, I would like to make a few notes about terminology and the layout of the thesis. In translating an expression of natural language into something formal, it is not enough simply to replace a word or concept by a symbol. An adequate symbolic representation ought to behave within the formalism in the way that the concept it represents behaves in natural language. Of course, this way of speaking *assumes* that the target of formalization has a meaning which behaves in a systematic way. This assumption is not a trivial one, although it will be assumed for expository efficiency until the critical sections of this thesis. This thesis is built upon work couched in terms of of words, expressions, signs, and lexical items. In accordance with the literature, I will use the word *expression* liberally to refer to sentences as well as to linguistic objects which may be more precisely called *lexical items* – when I intend to speak in this semitechnical sense I will use this term instead. The term *ascription* will feature prominently in this paper, and I intend it, naturally enough, to mean that specific sort of expression which ascribes something to something (possibly else). By *ascription of knowledge-how* I mean a phrase like 'X knows how to F' where X is a subject and F is a verb phrase.

2.1 Semantic content

2.1.1 Use and content

The distinction between use and content is a common feature of contemporary philosophy. In "Semantics, Pragmatics, and the Role of Semantic Content", Jeffrey C. King and Jason Stanley illustrate the distinction between these two concepts by reading them out of some contemporary philosophical discussion. Consider the following example of (King & Stanley 2005 : 1-2):

1. According to the contextualist about knowledge, the (propositional) semantic content of knowledge-claims is sensitive to context. In a context in which skeptical possibilities are sufficiently salient, the word "know" expresses a relation that holds between persons and a highly restricted range of propositions. In a context in which skeptical possibilities are not salient, the word"know" expresses a different relation, one that a person can bear to a proposition even if she is in a fairly weak epistemic position with respect to it. In support of her position, the contextualist often points to the undisputed fact that speakers? willingness to make knowledge-claims varies with context. Those who reject contextualism about knowledge typically try to give non-semantic accounts of variations in speaker hesitancy about knowledge-claims. In short, dissenters from contextualism try to argue that the facts that support contextualism are really facts about the use of knowledge-ascriptions, rather than their semantic contents.

2. In ethics, one version of internalism about reasons holds that someone understands a sentence containing genuinely normative vocabulary only if they are motivated in a certain way. That is, an internalist about moral reasons holds that being motivated is an essential part of the grasp of the semantic content of moral sentences. An internalist about reasons motivates her position in part by appealing to the fact that it is odd to utter an ethical sentence unless one has the relevant motivation. An externalist about reasons, by contrast, rejects the internalist thesis that being motivated is part of grasping the semantic content of moral sentences. An externalist seeks to explain the evidence about motivation by attributing it to facts (merely) about the proper use of ethical sentences, rather than the semantic content thereof.

These cases suggest that semantic content requires more than facts about use. Those who dissent from epistemic contextualism believe the evidence for it reflects the use of the relevant ascriptions but does not influence the content of those ascriptions. The ethical externalist, according to King and Stanley, does not think that "being motivated is part of grasping the semantic content of moral sentences" because they think that the relevant evidence only pertains to the use of such sentences. This gives us an idea of what semantic content is not, but does not really say much positive about it. In their article, King and Stanley describe and choose between three different perspectives on the distinction between semantics and pragmatics. This is a vast topic which I will not directly address. What is important for me here is that the distinction between semantics and pragmatics that they settle on allows for a clearer definition of semantic content.

This definition of content relies on a distinction originally due to David

Kaplan. Kaplan distinguished between the *character* and the *content* of expressions. He was particularly concerned with *indexicals* (like "I", 'and "she") and *demonstratives* (like "this" and "that"). In addition to propositions and their truth-conditions (i.e. truth-values at a world), Kaplan also speaks of the content of a *sentence*. Context determines the content of a sentence; this propositional content in context then determines an intension (i.e. a function from worlds to extensions). In this way context determines the truth-conditions of an expression. The function which associates an expression to its content in a context is called the *character* (or *standing meaning* of that expression. [1] Stanley adopts Kaplan's ideas but pitches a wider tent with respect to semantic content. Semantic content, to Stanley, includes both character and content in Kaplan's sense. (King & Stanley 2005 : 23) puts his perspective like this:

> On our favored conception of the semantics/pragmatics distinction, there are two levels of genuinely semantic content. On the first level are properties of individual words, rather than complex expressions. This is standing meaning, or character. On the second is semantic content, a property of expressions relative to contexts. The semantic content of any term relative to a context is the referential content in that context that is in accord with its standing meaning, and the semantic content of a complex expression is derived by combining the semantic contents of its parts in accord with the composition rules corresponding to its syntactic structure.

The second tier of Stanley's view concerns expressions understood in context. The semantic content of such expressions is the referential content that agrees with the standing meaning of the expression in context. Finally, Stanley affirms his commitment to *the principle of compositionality*, which holds that the meaning of a complex expression can be straightforwardly derived from the meanings of its constituent terms.

2.1.2 Form and content

In addition to use, content is also often discussed in the same context as *form*.

Form features here as *logical form* and *grammatical form*. These forms can be thought of as the products of logical and grammatical analyses, respectively. A grammatical analysis takes an expression of a natural language as input and returns an expression in terms of grammatical categories. Although I will often use grammatical terminology that is recognizable from grade school, I wish to emphasize that the categories used in analysis are also left to choice. A possible grammatical form of the sentence 'I have sorpotel' classifies "I" as a subject, "have" as a transitive verb, "sorpotel" as a direct object.[2]

[1] See section 3.2 of David Braun's article "Indexicals" in the *Stanford Encyclopedia of Philosophy* for a thorough exposition of Kaplan's theory.

[2] Sorpotel is a pork dish from the Konkan coast of India.

Logical form will play a more explicit and prominent role in this thesis. Like grammatical form, logical form can be described as the product of a logical analysis which presupposes a number of logical and representational choices. Not every formalism applies equally well to a given fragment of a natural language. For instance, in the predicate calculus it is easy to analyze 'I have sorpotel' as 'there exists an object x such that (a) x has the *sorpotel* property and (b) I am in the *have* relation with x.'[3] Carrying out such an analysis in the propositional calculus seems more unintuitive, since sorpotel is more easily thought of as an object than as a proposition.[4] Jason Stanley outlines two conceptions of logical form in "Context and Logical Form". In this thesis I will think about logical form in what Stanley calls the *descriptive* sense. This is one that he himself adopts and summarizes as follows in (Stanley 2000 : 2).

> [W]e may discover that the "real" structure of a natural language sentence is in fact quite distinct from its surface grammatical form. Talk of Logical Form in this sense involves attributing hidden complexity to sentences of natural language, complexity which is ultimately revealed by empirical inquiry.

Contrast this view with one which sees logical form as a tool to make expressions more precise or well-behaved in some specific area of technical inquiry. Stanley himself supports the descriptive view of logical form. Let us briefly consider why this fact is important in understanding his formal account of knowledge-how. Stanley uses logical forms because he believes that they reflect the "real" structure of knowledge-how ascriptions to a greater degree than the grammatical or surface form, not because they provide an analytical tool to clarify some issues in the subject. In this sense his project can be interpreted as one which aims to demonstrate what and how knowledge-how ascriptions "really" are.

2.2 States and possible worlds

A famous distinction which will be essential in understanding the ideas at play in this thesis dates back to Frege's classic "On Sense and Reference". As its title suggests, this article explores two different ways in which we commonly regard expressions: in terms of their *sense* and in terms of their *reference*. The purpose of this distinction is to consider what an expression refers to (its reference) separately from the thought of the expression itself (its sense). A number of writers use the term *intension* interchangeably with Frege's sense, and the term *extension* interchangeably with Frege's reference. I will follow this convention. These terms still leave much to the imagination of the formally-inclined: they do not explicitly describe either sense (intension) or reference (extension) in mathematical or logical terms. It is therefore unsurprising that

[3] My use of italics signifies the fact that *sorpotel* and *have* are taken to be relations within some formal structure (unary in the first case, and binary in the second).

[4] What I mean by "proposition" will be made clear in a later section.

theorists proceeded to interpret Frege's distinction in a number of different formal structures. The theorists whose work concerns this thesis make Frege's intuitions precise by adopting a *possible world semantics* where the extension (reference) of an expression e in a given world is what e refers to in that world, while the intension of e is the function which maps a world to the extension of e in that world.[5] A first step towards implementing these ideas is to come up with a formal representation of an expression. This is done through a variety of systems in contemporary formal semantics; Stanley's theory is based on a system called Ty2.[6]

According to a possible-worlds semantics, a proposition is usually identified with the worlds at which it is true. In order to apply this notion in epistemology, Stanley needs to relate possible-worlds to knowledge. He does this by invoking the idea of a *state*. In this thesis I will think of states as states-of-affairs (or states-of-the-world) rather than mental states or states of some machine. Although there is a cognitive component to some of Stanley's work, I will not follow that trail here. In Stanley's account, states and ascriptions are intrinsically related. (Stanley 2011 : 37) writes:

> Surely, if humans thought of the sort of state expressed by ascriptions of the form 'X knows that p' and the verb 'know' in [knowing-wh] sentences as clearly distinct, there would be many languages in which different words were employed. The fact that we do not employ different words for these notions suggests they are at the very least intimately related concepts.

It is worth mentioning that this passage features in Stanley's book before any formal semantic treatment of knowledge-ascriptions does. The function of this claim is to establish a "default" position before the analysis; read this way, the claim is that we ought to start with the belief that there is one state of knowledge.

The passage concerns the states expressed by knowledge ascriptions. The default position, Stanley claims, is that there is only one state expressed by both knowledge-that and knowledge-how ascriptions. Stanley claims that the existence of multiple such states would be reflected in many natural languages. Since this is not the case, he concludes that before formal analysis it is reasonable to assume that there is either a single concept or two very closely related concepts of knowledge at play here.

[5] Background on possible world semantics can be found in L.T.F. Gamut's "Logic, Language, and Meaning".

[6] Ty2 is a more convenient way to convey ideas which may otherwise be thought in Intensional Logic (IL).

2.3 Truth-conditions and theories of propositions

Semantic interpretation, according to (Stanley 2000 : 3), "results in truth-conditions". Stanley appropriates Jeroen Groenendijk and Martin Stokhof's (henceforth G&S) semantic analysis of questions to his work on knowledge-how. (Groenendijk & Stokhof 1997 : 2) write that "the term *proposition* is generally used to refer to the truth-conditional content of a sentence". As we will see, in practice, propositions are interpreted as collections of possible worlds. If a proposition p is the truth-conditional content of a sentence e, then e is true at each world in p.

One natural question to ask about truth-conditions and propositions is the degree to which they depend on context. Stanley has written quite a lot about this question. I quote him at length from (Stanley 2007 : 38).

> My own view of the truth-conditional role of context is very conservative. First, there are expressions which are obviously indexicals in the narrow sense of the term, words such as "I", "here", "you", "now", and their brethren. Secondly, there are expressions which are obviously demonstratives, such as "this" and "that". Third, there are expressions that are obviously pronouns, such as "he" and "she". Overt expressions that are in none of these classes are not context-dependent. If the truth- conditions of constructions containing them are affected by extra-linguistic context, this context dependence must be traced to the presence of an obvious indexical, demonstrative, or pronominal expression at logical form, or to a structural position in logical form that is occupied by a covert variable.

According to Stanley, context does have an impact in the "narrow" sense of expressions involving indexicals, demonstratives, and pronouns. However, he draws the line here. Indeed, (Stanley 2007 : 31) goes as far as defending "the claim that all effects of extra-linguistic context on the truth-conditions of assertions are traceable to logical form". I will not argue for or against this position. What is important for my work is that the only contextual variation that Stanley believes impacts the truth-conditional content of a sentence (i.e. the proposition corresponding to that sentence) can be traced to a narrow range of syntactic features of that sentence.

In the next chapter we will see that the role of context in this narrow sense turns out to be quite important to Stanley's account of knowledge-how. As an intellectualist, he believes that knowledge-how is the knowledge of a proposition (or set of propositions). In connection with Ginet's intuition, this proposition contains a specification of a way to do the thing that the subject is said to know how to do. So the state expressed by an ascription of knowledge-how can be expressed by the ascription of knowledge of the existence of true propositions containing ways of doing something. The idea of a way of doing something

depends on who that way is a way for. The specification of the way w in "I know that w is a way to climb that tree" should vary based on who "I" is.[7] A three hundred pound bodybuilder presumably cannot climb a spindly tree in the same way that a light gymnast can. It is reasonable, therefore, for the propositions containing these ways to vary based on what value the indexical "I" takes in a given context.

In order for Stanley's position to check out, the propositional knowledge-ascription it assigns to "I know how to climb that tree" should denote a proposition which varies as "I" does. This brings up two related notions: *ways of thinking* and *modes of presentation*. Ways of thinking apply to propositions while modes of presentation apply to the constituents of propositions. To make sense of the idea of a constituent of a proposition, note that formalizing expressions of natural language requires us to think in terms of objects, properties, relations, and functions (taken extensionally).[8] In this setting we can discuss one of Frege's famous puzzles:

Example 2.3.1.

1. Hesperus is Hesperus.

2. Hesperus is Phosphorus.

'Hesperus' and 'Phosphorus' are two different names for the planet Venus. For this reason, both propositions are true. The first proposition is true by definition, while the second proposition is true because both 'Hesperus' and 'Phosphorus' refer to Venus. When we embed these propositions to form knowledge-ascriptions, on the other hand, things get more complicated.

1. Hussain knows that Hesperus is Hesperus.

2. Hussain knows that Hesperus is Phosphorus.

Hussain does not know of Venus as either 'Hesperus' or 'Phosphorus'. For this reason the second sentence is false. He does not need to know anything about the referents, of course, to see that 'Hesperus is Hesperus' is true by definition; so the first sentence is true.

This example motivates the introduction of *modes of presentation*. 'Hesperus' and 'Phosphorus' present the same object, Venus, differently. Philosophers call those who accept this distinction *Fregean* and those who reject it *Russellian*. A Russellian may still accept ways of thinking as part of their theory of propositions: propositions may be presented in different ways, but where they disagree with the Fregean is about the presentation of objects, relations, and the other constituents of propositions. (Stanley & Williamson 2001 : 427) gives the following concise summary of the relevant points.

[7] Assume that the tree-climbing is being discussed from a first-person perspective.

[8] That the intensions of these constituents (that is, their definition in terms of possible worlds) is related to their extension will be made clear in the next chapter.

> According to the first theory, the contemporary Russellian theory, propositions are ordered sequences of properties and objects. According to the second theory, the Fregean theory, propositions contain modes of presentations of properties and objects, rather than the properties and objects themselves. Finally, according to the third standard theory, verbs such as 'believes' and 'knows' express three-place relations between persons, Russellian propositions, and ways of thinking of Russellian propositions.

We are now equipped to discuss the way that Stanley incorporates modes of presentation into his account at an informal level. In his solo work, he adopts a Fregean view. In his article with Timothy Williamson, he adopts a Russelian one.

2.4 Stanley and the knowledge relation

One of the most important steps in formalizing an ascription of knowledge-how is formalizing the word 'know'. The tradition that Stanley and Ginzburg both draw upon, differently and to different degrees, thinks of knowledge as a relation between a subject and something. For propositional knowledge, this something is a proposition. If the relation holds in a given state, then the subject knows the relevant proposition in that state.[9]

Intellectualism is a relevant question at this point. If knowledge-how is propositional knowledge, then the same relation that holds between a subject and a proposition should hold between of a subject in an ascription of knowledge-how.

Looking at the ascription 'X knows how to F', intellectualism presupposes that 'know' is a relation between X and the content of 'how to F'. This does not need to be the case, of course: perhaps we should instead consider the phrase 'know how' as a distinct relation between X and the content of 'to F'.[10] (Stanley & Williamson 2001) gives some syntactically-motivated reasons to choose the first option.[11] This is an important point because Stanley assumes that "the objects of semantic interpretation are the actual logical forms of English sentences" (Stanley 2000 : 6). Instead of assuming that the logical form of 'know how' and 'know' are different, Stanley believes that the logical form of 'know

[9]This phrasing is due to the fact that I take Stanley's states as states-of-affairs. To say that the subject is *in the state of knowing* a proposition would phrase the case in terms of mental states.

[10]This is a stronger position than anti-intellectualism requires. Given a certain semantic theory, it may be that knowledge is a single formal relation but that the content of 'how to F' is not a proposition. Ginzburg takes this route.

[11]I will not comment on their reasoning here, but instead refer the reader to Ian Rumfitt's 2003 "Savoir Faire" and Stanley's response in *Know How* for an interesting discussion around this topic.

how' is derived from the logical form of 'know' by complementation with 'how'. In the semantic stage of interpretation, therefore, a knowledge-ascription is true when a single state obtains, independently of what complement 'know' takes in that ascription.

Given that 'know' is considered as a distinct relation between a subject and a 'how to' clause, Stanley's process can be broken into two steps. The first is step is to account for the *embedded question* 'how to F?'. The semantic theory of questions that he employs posits that questions are constituted (in a way to be discussed) in terms of their answers. Answers to the question 'how to F?', according to the semantics Stanley uses, look like 'w is a way to F' – a clear connection to Ginet's intuition. The second step clarifies the nature of these ways and the propositions which present them. In particular, Stanley wishes to account for the fact that subjects encounter ways in both the third-person and the first-person. As I will explain in more detail, he does this by linking a piece of generative syntactic theory to a Fregean theory of propositions. Before proceeding to this portion of the discussion, however, I would like to briefly summarize Stanley's views on how the relation 'know' should be understood. He does not comment explicitly on this in *Know How*, but has written extensively on the subject elsewhere.

2.4.1 Interest-relative invariantism

Stanley outlines his unique perspective on knowledge in his book *Knowledge and Practical Interests* (Stanley 2005). In that work, he focuses on how the truth of knowledge ascriptions depends on practical facts about the situation in which knowledge is ascribed. He calls this view *interest-relative invariantism* or *IRI*. The interest-relative portion suggests that the truth-conditions of knowledge-ascriptions depends on the interests of the speaker and the audience. The invariantism portion of the name corresponds to Stanley's belief that interests are the *only* contextual factor that is relevant in the determination of these truth-conditions. This notion is not in itself a standalone theory of knowledge. Rather, it is conceived of as a *condition* on any potentially acceptable theory of knowledge. Stanley himself makes this fact very clear; in (Stanley 2005 : 87) he writes that he is "not sanguine about the possibility of providing a theory of knowledge, and that is not [his] interest here". The thrust of Stanley's argument pertains to the relationship between context and the content of knowledge ascriptions. According to IRI, the truth of a knowledge ascription depends on context only inasmuch as they depend upon the interests of the speaker and audience.

Consider the following example from (Stanley 2005 : 3-5). Hannah and her wife Sarah are deciding on whether or not to go to a bank to deposit their paycheques on a Friday afternoon, a time henceforth written t. It so happens that the line at the bank is very long. Hannah says that she had been at that bank two weeks ago on Saturday morning. The proposition p under their mutual

consideration is therefore whether or not the bank will be open the following Saturday morning.

Stanley considers a set of possible situations that the pair find themselves in at t. In the *low stakes* case, the two have no immediate need to deposit the money. In this case, Stanley claims that Hannah's utterance of 'I know the bank will be open' is true. Another possible situation is the *high stakes* case. In this case, the pair need to deposit the money as soon as possible and so it is very important to be sure that the bank will be open tomorrow, on Saturday morning. In this case, Stanley claims that Hannah's utterance of 'I don't know that the bank will be open' is true. The reason that Stanley comes to these apparently contradictory conclusions is that, to him, the truth of each ascription depends on what is at stake.

At this point it is natural to ask *whose* practical interests determine the content of a knowledge ascription. An ascription 'X knows p' has a subject X as well as an attributor. The two cases we mentioned so far have Hannah as both attributor and subject of the relevant ascription. The other conceivable case is to have someone attribute knowledge to someone (or something) else. Stanley mentions two cases when the attributor is not the subject. The *high attributor - low subject stakes* case is a modification of the high stakes scenario. The stakes remain high, but in this case Hannah asks Bill whether the bank will be open. Bill, who has considerably less at stake, tells Hannah that the bank will be open because he was there two Saturday mornings ago. Stanley then claims that Hannah is right when she says 'Bill doesn't really know that the bank will be open on Saturday'. This is because Bill's evidence, that he was at the bank two Saturday mornings prior, is evidence that Hannah already possessed when she concluded that she did not know that the bank would be open. Bill communicated that this was his reasoning to Hannah, and so she not only knew that he had less at stake than she did but also that he had the same evidence. Hence the truth of her ascription.

It is not always the case that the attributor's stakes are the dominant ones in determining the truth of a knowledge ascription. In the *low attributor - high subject stakes* case, Hannah and Sarah once again have a lot at stake. This time the ascription is made by Jill, who met Hannah at the bank two weeks prior and has nothing at stake. Stanley claims that her ascription 'Hannah knows the bank will be open on Saturday' is false. Although both Jill and Hannah have the same evidence that the bank can be open on Saturday morning, the fact that Jill has much less at stake than Hannah leads her to accept evidence as sufficient that Hannah rejects as insufficient. In the low and high stakes situations there is only one relevant set of stakes by which the truth of a knowledge ascription can be determined. In the cases where the stakes of the attributor and the subject vary it seems as if the one whose stakes are higher determines the truth conditions.

As he writes in (Stanley 2005 : 86), "a knowledge ascription such as 'Herman knows at 1:30 p.m. on September 24, 2004 that Hillary Clinton is a Democrat' expresses the same proposition relative to every context of use, and hence is not context-sensitive". Herman's knowledge is the locus about which the content of Stanley's example ascription can vary. According to IRI, whether or not Herman knows Hillary Clinton is a Democrat can be assessed at this point, since once Herman's stakes can be determined as the evaluation of his practical interests at the time (1:30 p.m.). This can be thought of as the 'interest-relative' component of Stanley's condition. The 'invariantism' portion of the name comes from the stipulation that the content of the ascription is fixed once its truth is assessed under the practical interests manifested at the relevant point of time. In other words, the truth of a knowledge ascription is invariant after interest-variance is taken into consideration. Stanley himself does not focus on IRI in *Know How*. I have included it here for two reasons: one is that I believe that the question of interests is a helpful consideration in the understanding of knowledge. This is a point which emphasizes an advantage of the ascriptional approach: interests easily come to mind in the context of conversation or linguistic behaviour about knowledge. They are perhaps harder to draw out of abstract discussion of Knowledge with a capital K. Another reason I have included this point is to put Stanley's theory of propositional knowledge in context; this is relevant information, I believe, since the meaning of the word 'know' is an important part of an account of knowledge-how. There is much more to be said than this about IRI, but I will not say it here.

2.5 Semantic externalism

According to Stanley, predicates like 'knowledge' have a particular extension when they are semantically interpreted. How this extension is determined depends on the framework in which the predicate is being considered. A contextualist will say that the extension of such a predicate varies across a discourse as the context changes. To an interest-relative invariantist, the predicate's extension only depends on what is at stake for speaker and audience at the time of utterance.[12] What is common to all of these accounts is that there are objects for these predicates to refer to. In this sense, Stanley's theory of knowledge relies on the doctrine of *semantic externalism*. As we will see, this way of thinking pervades the semantic frameworks of questions that are to come. It is *by* this doctrine that Stanley can sensibly define what a way is. The premise of external reference is intuitive enough: 'table' ought to refer to a table simply based on common sense.

The linguistic objection, however, is natural enough as well. Why should *words* so neatly cut out objects? Why not parts of words, or collections of words, or strings of consonants? Noam Chomsky puts the point well in the

[12]This is not to say that interests are only manifested as stakes. Rather I am just saying that they are relevant in an interest-variant semantic theory because they allow for the specification of what is at stake at a given time.

following quote:

> As far as is known, it is no more reasonable to seek some thing-in-the-world picked out by the word 'river' or 'tree' or 'water' or 'Boston' than to seek some collection of motions of molecules that is picked out by the first syllable or final consonant of the word 'Boston'. With sufficient heroism, one could defend such theses, but they seem to make no sense at all. Each such usage of the words may well pick out, in some sense, specific motions of molecules and things-in-the-world (the world as it is, or is conceived to be); but that is a different and entirely irrelevant matter. (Chomsky 1996: 48.)

Chomsky strikes me as very reasonable. Although words are the common-sense locus of meaning, linguistics as Chomsky and the generativists see it studies the language faculty by scientific, not common sense, methods. There is no good linguistic reason, Chomsky argues, to associate words with anything in the world at all. It may be objected that linguistic behaviour is intimately tied to things in the world – in a (usual) interaction between a barista and a customer, one expects an espresso when asking for 'espresso'.[13] It is worth nothing that this intuitive objection becomes increasingly less intuitive when we move from lexical items like 'espresso', which to the externalist would denote everyday objects, to items like 'knowledge', which cannot so intuitively be identified with some everyday object. Furthermore, such an interaction is the product of many factors, only some of which are semantic. It involves a combination of social norms, specific contextual features (and possibly more); for instance, it may be that both the barista and the customer are drug smugglers and use 'espresso' to refer to contraband. This does not mean that the barista will give every customer contraband when asked for 'espresso'. Employing pragmatics, e.g. a maxim that changes reference, can explain this reply away. How that process works is then put firmly out of the explanatory capacity of semantics. But then it is hard to see why an identification of word with world that relies so heavily on non-semantic factors should be so central in the constitution of a semantic theory. In short, Chomsky suggests that it makes no more sense to adopt such a hypothesis for words than it does to do so for syllables or consonants. While I will not dwell on this consideration throughout, I will return to it in the later chapters of this thesis.

2.6 A summary of what's to come

Enough concepts are in place at this point for me to outline the general line of inquiry I will follow for the rest of this thesis.

1. What justifies or necessitates Stanley's use of a Fregean theory of propositions?

[13] Thanks to Martin Stokhof for this point.

2. Is the adoption of Fregeanism a semantic move, or is it a philosophical move of a different sort?

The short answers to these questions are:

1. The *Hamblin-style* semantic theories of questions Stanley employs necessitate his adoption of Fregeanism.[14]

2. Stanley ties propositional attitudes to a postulated phonologically null element in contemporary generative syntax known as PRO.[15]

The short rebuttals to these answers are:

1. It is not necessary to adopt a Hamblin-style semantic theory of questions to treat knowledge-how ascriptions formally.

2. Not all linguists accept a theory of syntax which postulates phonologically null elements.

[14] This will be detailed in the next chapter.
[15] This will also be detailed in the next chapter.

Chapter 3

Stanley's theory of knowledge-how

This chapter details the formal semantic methods that Stanley uses to support his theory of knowledge-how. A primary component of Stanley's theory of knowledge-how is his treatment of the *embedded question* in an ascription of knowledge-how. He gets this component from the formal semantics of questions. He explicitly adopts the framework outlined in Groenendijk & Stokhof's (henceforth G&S) 1982 paper "Semantic Analysis of Wh-Complements". (Stanley & Williamson 2001) uses Lauri Karttunen's 1977 semantics, which is in many ways a precursor to the G&S framework. I am only interested in Karttunen's theory in order to motivate Stanley's choice of the G&S semantics. I will sometimes refer to both the Karttunen and G&S semantic theories as *Hamblin-style*. This position, it will be seen in a later chapter, is not universally accepted. Indeed, an alternative to this position motivates Jonathan Ginzburg's own formal semantic account of knowledge-how.

3.1 Hamblin-style semantics

Groenendijk & Stokhof characterize the Hamblin picture of interrogative semantics by three postulates.

1. An answer to a question is a sentence, or statement.
2. The possible answers to a question form an exhaustive set of mutually exclusive possibilities.
3. To know the meaning of a question is to know what counts as an answer to that question.

(Groenendijk & Stokhof 1997 : 21-22) briefly discusses these three postulates and what they mean for a semantic theory of questions. The third postulate

reduces questions to answers while the first two postulates say what it means for a proposition to be an answer. Instead of taking answers to be subsentential phrases, the authors tell us to consider them as ways of conveying information.[1] The second postulate defines the sort of propositions that answers are – mutually exclusive and exhaustive. The term 'exhaustive' is taken with respect to a notion of logical space, described on page 22 of GSQ as "the space of possibilities [a question] leaves the world to be like". It is for this reason that the answers of a question are said to partition its induced logical space. A literal reading of the third postulate keeps us away from a direct characterization of the meaning of a question. Instead it says what it is to *know* the meaning of a question; it says that this knowledge is the knowledge of what counts as an answer. I will follow the literature and identify this definition with that which views a question as the partitioned logical space of its answers.

Lauri Karttunen's 1977 paper "Syntax and Semantics of Questions" differs from Hamblin by understanding the logical space associated to a question only by its *true* answers. It is therefore sufficient, according to Karttunen, to omit the false answers to a question when considering its semantics.

To Hamblin, a question was the set of all its answers. Karttunen's theory cuts this set down to only the true answers. The convenience here is that a set of true answers can be represented by a characteristic function from the set of propositions to the boolean set $\{0, 1\}$. Karttunen's theory of questions allows us to represent questions in the λ-calculus. At this point I can give some examples that gesture towards the type of representation that I will soon discuss.

Example 3.1.1. These two examples are taken from (Stanley 2011 : 45).

1. Let's start with a simple question: "Is it raining?". This question does not have any wh-phrases or any other complicating factors. Let r denote the proposition that it is raining and $\neg r$ the proposition that it is not raining. We can represent this question according to Hamblin like this:

$$\lambda p.\ p = r \vee p = \neg r$$

   Karttunen, in contrast, only considers true propositions:

$$\lambda p.\ p(i) \text{ is true} \wedge (p = r \vee p = \neg r)$$

   Notice that there are two types of representation here. When I write that $p = r$, for example, I am writing at the level of propositions. In Fregean terms, this is the level of sense. When I write $p(i)$, on the other hand, I am at the level of reference, considering the denotation of p at the

[1] The relationship between answerhood and informativity will be cast in another light when we examine Ginzburg's theory and his surrogate notion of *resolvedness*. G&S also discuss this relation in their 1984 thesis, but Stanley uses their 1982 rather than their 1984 work.

given world i.[2] G&S incorporate both of these types into a two-sorted type theory Ty2, originally developed by Daniel Gallin in 1975. In their theory, it is possible to abstract over both propositions and possible worlds (which they call *indices*.) The informal notation I am using now is motivated in part by their notation. In general, I will write $p(i)$ for the denotation of the proposition p at index i, while I will write p when I wish to refer to the proposition as an object.

2. Consider the question "How did the milk spill?". The previous example was simple enough to be represented in the propositional calculus with λ-abstraction. The predicate calculus is an appropriate scheme to answer 'How did the milk spill?', as it allows for the specification of ways in which the milk spilled.

   The set of true answers to "How did the milk spill?" at a given index is then the set $\{\ p\ |p(i)$ is true $\wedge\ \exists w : p =$ 'the milk spilled in way w'$\}$. This is naturally represented in Karttunen's semantics as:

   $$\lambda p.\ p(i) \text{ is true} \wedge \exists w(p = \text{'the milk spilled in way } w\text{'})$$

   Perhaps there is only one way that the milk spilled: the cat knocked it over. It is also possible that the milk spilled in more than one way: perhaps the cat knocked it over at the same time as the dog did. What counts as a way for milk to spill, and how to tell different ways of spilling milk apart, is a question for the philosophy of spilling (possibly of milk-spilling) and not quite my concern here. However, these sort of questions are worth asking of ways in general: how many ways are there to spill milk? To ride a bicycle? To roll a cigarette? To write a thesis? It does not seem like an easy question to answer.

One point that can be noted at this point is that truth has so far been only mentioned with respect to a particular world. I will discuss this in more detail when I address the G&S theory.

3.2 Knowledge in Karttunen's theory

Both the Karttunen and G&S accounts take wh-questions – that is, who/ what/ where/ why-questions – to have the same structural properties as whether-questions.[3] Whether-questions are also referred to as yes/no questions. Karttunen notes that whether-questions and wh-questions are not identically distributed: dubitative verbs take whether-complements but not wh-complements

[2] Instead of writing out functions explicitly, Karttunen relies on the $\wedge$ / $\vee$ notation in his work. I will not go into that here as it does not really concern my topic, but interested readers are referred to the second volume of L.T.F. Gamut and (Karttunen 1977).

[3] (1) See (Karttunen 1977 : 5) for details on Karttunen's reasoning. (2) G&S do not explicitly deal with how-complements in their work. The identification of 'how' as one of the wh-phrases is due to Stanley (and Williamson). More on this later.

while emotive factives have the opposite tendency. However, these instances are sparse enough to conclude that "wh-questions and whether-questions should be assigned to the same syntactic category" (Karttunen 1977 : 5).

Since I only am interested in discussing it inasmuch as it motivates the G&S semantics, I have not and will not go into how Karttunen's theory actually works. However, from what has been said so far, a problem with his theory as regards knowledge and Stanley's project can already be made apparent. To see this, recall two facts. First, Karttunen regards whether-questions and wh-questions as objects of the same category. Second, he regards wh-/whether-questions as *sets* of propositions rather than single propositions. According to Karttunen, the knowledge-whether ascription 'Bill knows whether John walks' is represented by the following expression at an index i:

$$\text{Know'}(b, \lambda p.(p(i) \text{ is true} \wedge (p = walk'_*(j) \vee p = \neg walk'_*(j)))$$

'Know' is represented here as a relation $Know'$ between (the intension of) an individual and a collection of propositions. Now consider an typical example of propositional knowledge; for instance, take 'Bill knows q'. This can be straightforwardly translated to $know'(b, q)$. I deliberately use the symbol $know'$ instead of $Know'$ here to denote that the relations are actually *different*. The knowledge relation in the whether-ascription relates an individual with a set of propositions while the knowledge relation in the that-ascription relates an individual to a single proposition. Since the two relations have different types they cannot be formally the same. To Karttunen, whether and wh-questions have the same grammatical category and so wh-questions prone to the same problem. It is an additional stipulation (of Stanley's) that how-questions and wh-questions should be treated analogously, and so Karttunen's semantics would pose this same problem for Stanley's account of how-questions. In what follows I will briefly discuss Karttunen's response to this problem. A response is warranted since there is a close relationship between knowledge-wh/knowledge-whether and knowledge-that.

It is worth mentioning that this problem sits particularly badly with the intellectualist project: given Stanley's intuition that there is only a single state of knowledge, there should be a *single* knowledge relation.

Even without intellectualism in mind, this discrepancy between knowledge-wh and knowledge-that is concerning. A substantial issue is how such a system can deal with the conjunction of embedded wh-questions (or whether-questions) with that-clauses. For example, 'I know both how to roll a cigarette and that cigarettes are bad for my lungs' is a perfectly sensible sentence, yet it involves a conjunction of elements of two different types, according to Karttunen. Formally, conjunction is nicest when it is between objects of the same type. Since the translation of 'know' varies based on the complement that it takes, either a very flexible theory of connectives or a way to relate the two variants of the knowledge-relation is necessary. Karttunen takes the second route.

Another substantive objection regards the close relationship Karttunen's two

variants of knowledge have in descriptions of everyday reasoning. To see this directly, consider the following example.

Example 3.2.1.

1. Suppose that John walks in the relevant context. Then the following inference is valid.

$$\text{Bill knows whether John walks} \wedge \text{John walks} \Rightarrow \text{Bill knows that John walks}$$

2. Suppose that John doesn't walk in the relevant context. Then the following inference is valid.

$$\text{Bill knows whether John walks} \wedge \text{John doesn't walk} \Rightarrow \text{Bill knows that John doesn't walk}$$

Karttunen notices and accounts for this relation between the two representatives of the knowledge relation in his theory. He distinguishes the variant which takes embedded questions by writing it formally as $know_q$. This sets it apart from the variant which arises in ascriptions of propositional knowledge, denoted $know'$.

Definition 3.2.1. A subject X $knows_q$ F if and only if X $know'$ p for all propositions p for which $F(p)$ holds. If there is no such p and yet X $knows_q$ F, then X $know'$ q holds, where q is the proposition that there is no p for which $F(p)$ holds.

Some computation with Karttunen's theory confirms that his postulate functions as he intends it to, and patches the hole in question. I will not go into any more detail about this point, however, since Stanley himself chooses to go with the approach in (Groenendijk & Stokhof 1982). G&S do not take the same route as Karttunen: instead of relating one knowledge relation to the other via a meaning postulate, they incorporate both of Karttunen's relations in a single knowledge relation.

3.3 Groenendijk and Stokhof's semantics

I will begin this section by recalling the fact that knowing whether ϕ implies knowing that ϕ ($\neg\phi$) given ϕ ($\neg\phi$). This means that an ascription of knowing whether ϕ is a *function* which returns an ascription of propositional knowledge given the truth or falsity of ϕ. Groenendijk and Stokhof understand this as a property of *whether*. They regard the complement 'whether ϕ' as a function. In any given state of affairs ϕ will either be true or false. So the denotation of 'whether ϕ at a particular world will, intuitively enough, return ϕ or $\neg\phi$ depending on whether ϕ. On the other hand, 'that ϕ denotes that ϕ. It is this

intuition that Groenendijk and Stokhof use to provide a unified formal account of the knowledge relation.

As a result, the two knowledge predicates postulated by Karttunen can be regarded as one and the same relation. According to (Groenendijk & Stokhof 1982 : 2) write,

> The denotation of that-complements is *index independent*: at every index *that* ϕ denotes the same proposition. The denotation of a whether-complement may vary from index to index, it is *index dependent*. At an index at which ϕ is true it denotes the proposition that ϕ; at an index at which ϕ is false it denotes the proposition that not ϕ.

According to G&S, wh-complements (including whether-complements) and that-complements are both functions mapping possible worlds to propositions. The two classes differ, however, as that-complements are constant functions, while whether-complements may vary based on their input.

Definition 3.3.1. Let ϕ be a proposition with formal representative ϕ'. Then *whether* ϕ is formally defined:

$$\lambda w.\lambda i.\Big(\phi'(i) = \phi'(w)\ \Big)$$

This definition means that, evaluated at a particular index w, *whether* ϕ is that proposition which returns true at exactly and only those indices i where ϕ has the same truth value that it does at w. Let's quickly test this to make sure that the implication we want to work does work after all.

Example 3.3.1. Suppose ϕ is a proposition that is true at w. Then we have the following short calculation.

$$\begin{aligned}(\textit{whether}\ \phi)(w_0) &= \lambda w.\lambda i.\Big(\phi'(i) = \phi'(w)\ \Big)(w_0)\\ &= \lambda i.\Big(\phi'(i) = \phi'(w_0)\Big)\\ &= \lambda i.\Big(\phi'(i) = 1\Big)\end{aligned}$$

In set-builder notation, the final product is $\{i|\phi'(i) = 1\}$. This is identical to the proposition that ϕ. Now suppose ϕ is false at w. An analogous calculation results in the set $\{i|\phi'(i) = 0\} = \neg\phi$.

3.3.1 Knowledge-how and knowledge-wh

Let's move now from knowledge-whether to knowledge-wh. G&S do not describe the semantics of knowledge-how in their work. They restrict themselves to yes/no questions as well as wh-questions in the more restricted sense of who/which/where/when/why. The inclusion of how-questions in the class of

wh-questions is therefore a step in itself. It is, furthermore, a very important step in Stanley's analysis: without it, he would not be able to use the wh-complement analysis of G&S. Some argument for this identification can be found in (Stanley & Williamson 2001 : 6-10). The reason this is complicated is because 'know' is often thought of as an *epistemic resolutive*, like 'learn', 'discover' and 'forget'. Epistemic resolutives, in general, do not naturally take 'how-to' complements. Constructions like 'Niraj believes how to walk' or 'Niraj discovers how to cycle' or 'Niraj forgets how to eat' do not have a clear meaning. 'Niraj knows how to walk/cycle/eat', on the other hand, does. There are other epistemic resolutives, like 'learn' and the transitive 'teach', which behave like 'know' in this respect. What is important for the time being is that Stanley takes a step which G&S do not, and also that some epistemic resolutives (particularly 'know', 'learn', and 'teach') take 'how-to' complements while others do not. It is conceivable, therefore, that Stanley's analysis of knowledge here *also* applies to 'learn' and 'teach'. However, as Ginzburg notes in (Ginzburg : 5), "in English, 'know' cannot combine with infinitivals like 'learn' and 'teach' can. There are, nonetheless, various languages where the same lexical item is used to describe propositional knowledge and skills or abilities". He includes Greek, Italian, and Hebrew in this class. This is relevant because Stanley is interested in cross-linguistic analysis. He has discussed the topic of knowledge-how in French and English with Ian Rumfitt, and has dedicated a considerable amount of writing to cross-linguistic concerns in the sixth chapter of *Know How*. Therefore, the fact that 'know' behaves slightly differently from 'learn' and 'try' in English, but not in a number of other languages from different language families, need not impact Stanley's equal treatment of the three words.

We saw that an ascription of the form 'X knows whether ϕ outputs different propositions depending on whether ϕ is true or false at the index in question. Although I have been speaking of whether-complements and what Karttunen called wh-complements as objects of the same type, at this point it is useful to note that the translation of a whether-complement is simpler than the translation of a wh-complement. With this distinction accounted for, all wh-complements can be translated the same way; what differs is the way we think of the models in which the complements are interpreted. Who-phrases correspond to propositions about people, where-phrases to propositions about places, and so on. How-phrases correspond to propositions about ways. Consider the ascription 'Bill knows how to ride a bicycle'. In the context this ascription is evaluated in, there is some (possibly empty) set of ways in which Bill can ride a bicycle.[4] A reasonable parallel to the knowledge-whether implicature is:

$$\begin{aligned}&\text{Bill knows how to ride a bicycle} \wedge C \text{ is a way to ride a bicycle}\\ &\qquad\qquad\Rightarrow \text{Bill knows that } C \text{ is a way to ride a bicycle}\end{aligned}$$

[4]The nature of ways is an important feature of both formal semantic accounts of knowledge how. I will address this topic in detail in subsequent sections.

This form of implication is clearly similar to the knowledge-whether implications we mentioned earlier: the truth of a knowledge-that ascription follows from the truth of a knowledge-wh ascription given a fact about the world. Yet the two forms are not the same. In the knowledge-whether form, the required truth about the world is one of two mutually exclusive and exhaustive propositions. In the knowledge-how form, the required truth is a fact about what ways of carrying out the relevant action are available to the subject in the given world. Knowing ways is not necessary for demonstrating knowledge-whether (although it is sufficient). It is in this sense that knowledge-how, along with all other forms of knowledge-wh except knowledge-whether, requires the world to have a *domain* with which the ascription interacts. We saw that whether-complements could be understood only in terms of λ-abstraction and propositional modal logic. We just saw that wh-complements rely on quantification over a domain (of ways, in the case of how-complements) that is associated to each index. As a result, any model of the translations must have enough structure to support quantification.

3.3.2 Knowledge-how ascriptions and ways of knowing

The informal scheme of Stanley's thesis can be boiled down to this. Ascriptions of knowledge-how can be treated just like ascriptions of knowledge-wh (who, what, why, where, which). According to G&S semantics, the propositional content reflects Ginet's intuition and contains a specification of a way of knowing. The fact that these ascriptions are translated into propositions in the G&S framework implies the intellectualist position that Stanley maintains.

The question that we can now approach is whether and how this method provides justification for Ginet's intuition that knowledge-how is knowledge of a proposition that contains a specification of a way. The G&S theory (and the Ty2 system in which it is framed) provides an *ontological* space in which ways are well-defined objects. There are, however, objections to this approach which can be formulated at this point. One potential objection is that, while ways can be formalized in the same manner as more intuitive everyday objects like tables and chairs, the fact that it is only possible to point to a way or describe it in some circumstances – contrast "a way to write a thesis" with "a table" – should be a warning against regarding the two as the same type of thing.

A way, according to the G&S theory, has a denotation which inhabits a possible world. It also has an intension or sense which returns that denotation at that particular world. Instead of dealing only with referents of ways (in the case of a who-question, people; in case of a where-question, places, and so on) at particular indices, G&S abstract over the *sense* of ways. They then evaluate this sense at the indices in question to return the relevant referents. This step is not totally obvious. I will assume the semantic externalist idea that *words* correspond to things in the world. Yet it remains unclear what the sense of a word is: perhaps in the possible world which I am concerned with, the reference of 'espresso' is indeed espresso. In another possible world, it might be

contraband. This is totally unknown to me – I have never gone to a cafe where I receive contraband instead of espresso. So it is hard to say that my sense of the word 'espresso' includes contraband. If sense is a function from worlds to referents, on the other hand, the possibility of my use of 'espresso' referring to contraband is enough to include it in the sense of 'espresso'. I am not going to dwell on the last two considerations; I only mentioned them to note that I am somewhat uneasy with how sense is defined. With this said, I will proceed with the exposition.

Since there are two types of abstraction occurring when dealing with wh-complements, one over indices and another quantification over individuals in the domain of a particular index, some additional notation is helpful. Let s denote the type of indices and t the type of truth-values. Then (the intension) of a way can be represented as a thing of type $\langle s, t\rangle$. I will write $a : T$ to indicate that a is of type T. For example, $i : s$ means that i is an index.

Definition 3.3.2. Let ϕ be an intransitive verb phrase with formal representative ϕ'. Consider the phrase 'how to ϕ'. According to Stanley, this is a wh-complement and so G&S semantics applies.

$$\textit{how to } \phi = \lambda w : s.\ \lambda i : s.\ \lambda x : \langle s, t\rangle.\ \phi'(i)(x(i)) = \phi'(w)(x(w))$$

Notice the specification of types: for future reference, note that I will always use w and i to refer to indices (more than two will not be needed in this work) and use x, y, z to refer to senses of ways (or people, places, etc.). This should be kept in mind, as I will not continue to explicitly specify the type of each variable in each expression. Let's test this definition out on the implication we just went over.

Example 3.3.2. The verb 'know' in 'Bill knows how to ride a bicycle' is a relation between 'Bill' and 'how to ride a bicycle'. Since a primary motivation of this theory is its unified treatment of the knowledge relation, we can work with the single relation *know* without concern.

Let b denote 'Bill' in our system. Then 'Bill knows how to ride a bicycle' has translation

$$\textit{know}'(b, \lambda w.\lambda i.\lambda x.\Big(\textit{cycle}'_*(i)(b, x(i)) = \textit{cycle}'_*(w)(b, x(w))\Big)$$

The proposition that C is a way to ride a bicycle is the function $\lambda i.\textit{cycle}'_*(i)(C)$, and the proposition that Bill knows that C is a way to ride a bicycle is therefore $\textit{knows}'(b, \lambda i.\textit{cycle}'_*(i)(C))$. Let us consider the implication at some world w_0 and suppose that both premises are true.

$$know'\Big(b, \lambda w.\lambda i.\lambda x.\ cycle'_*(i)(b, x(i)) = cycle'_*(w)(b, x(w))\Big)(w_0)$$
$$= know'\Big(b, \lambda i.\lambda x.\ cycle'_*(i)(b, x(i)) = cycle'_*(w_0)(b, x(w_0))\Big)$$
$$= know'\Big(b, \lambda i.\lambda x.\ cycle'_*(i)(b, x(i)) = cycle'_*(w_0)(b, x(w_0))\Big)$$

We know that $cycle'_*(w_0)(b, C(w_0))$ is true, so:

$$know'\Big(b, \lambda i.\ \lambda x.\ cycle'_*(i)(b, x(i)) = cycle'_*(w_0)(b, x(w_0))(C)\Big)$$
$$= know'\Big(b, \lambda i.\ cycle'_*(i)(b, C(i)) = cycle'_*(w_0)(b, C(w_0))\Big)$$

Since $cycle'_*(w_0)(b, C(w_0))$ is true (i.e. $= 1$),

$$\lambda i.\ cycle'_*(i)(b, C(i)) = 1$$

is the proposition which is true exactly when and where C refers to a way to cycle. So we can conclude that Bill knows that C is a way to cycle, as expected.

3.4 Theories of propositional attitudes

A Fregean theory is quite natural given what has been seen of the G&S theory: there are already intensions and extensions, the only variable left to interpretation is whether propositions are made up of elements (as a Russelian would say) or of presentations of elements (as a Fregean would say). Although Stanley spends considerably more time on ways of knowing in his standalone work, I will draw from his article with Williamson here. I think that their briefer and more succinct exposition is enough given that we have already covered a good deal of formal background that was not examined in (Stanley & Williamson 2001). The one caveat for this section is to think of 'Fregean' whenever a quote mentions a Russelian proposition.[5]

According to (Stanley & Williamson 2001 : 16), the ascription 'Hannah knows how to ride a bicycle' is true if the knowledge relation holds between Hannah and a Russelian proposition containing a way of riding a bicycle (along with other objects and properties)".[6] The propositional content of this ascription depends on how it is entertained (or, to the Fregean Stanley, how the way is presented).

[5] Stanley & Williamson settle with a Russelian account of propositions but note that their account works for either Russelian or Fregean accounts. Stanley's solo work adopts a Fregean perspective. I will note differences when they present themselves.

[6] As with all of Stanley & Williamson's work that I will discuss here, replace "Russelian" with "Fregean".

Under one way of entertaining the proposition, she only needs to point to someone cycling to show that she knows that *that* way is a way for one to ride a bicycle. This may be called "demonstrative", and can analogously be applied to the way of knowing to cycle when speaking in Fregean terms. If there is no cyclist in sight, Hannah could also simply describe the act of cycling in generic terms. This description does not need to capture exactly how Hannah would cycle herself. All that is required is for Hannah to give a way for one to cycle – this is obviously something with flexible truth conditions, but in principle it is easily possible for Hannah to spell this out in a set of propositions.

Another way of reading 'Hannah knows how to ride a bicycle' is as a *de se* ascription. This sort of attitude is summed up by Stanley and Williamson's example of the unfortunate and remarkably dense John, who sees himself on fire in a mirror but mistakes the mirror for a window. As a result, in this context 'John believes that that man has burning pants' is true while 'John believes that he himself has burning pants' is false. To capture ascription *de se* – that is, ascription pertaining to oneself – Stanley (and Williamson) invoke the idea of knowledge of a proposition under a different mode of presentation. Stanley and Williamson call these "practical". The relationship between practical modes of presentation of ways and how-to instances, the authors claim, parallels the connection between "pronouns such as 'he himself' and first-person modes of presentation" (Stanley & Williamson 2001 : 25). In the case of John with the burning pants, 'John believes that he himself has burning pants' is practical while 'John believes that that man has burning pants' is demonstrative.

Fregean theory differs from Russelian one is in what it regards as the locus of presentation. A Russelian believes that we access entities themselves, while a Fregean believes that we access presentations. Thus (Stanley & Williamson 2001), as a Russelian account, speaks in terms of *propositions* being entertained under different presentations. A Fregean account can be more direct and speak directly of the entertainment of different presentations of *ways* themselves.[7]

One clear moral of this analysis is that much of the contemporary discussion on the relationship between knowledge-how and propositional knowledge may be misplaced. The variety named explicitly in (Stanley & Williamson 2001) is "practical knowledge". Practical knowledge intuitively corresponds to that subcategory of knowledge-how which is not easily thought of in terms of propositional knowledge. The other variety, which corresponds to a naive understanding of propositional knowledge, was not named explicitly by Stanley and Williamson. Let's call it "theoretical knowledge". These are the two most obvious means by which ways can be presented, but they are not necessarily the only presentations of ways. Indeed, the spectrum of presentations corresponding to a given way (intension) presumably depends on the ascription it features in. Some cases may have both practical and theoretical readings while others may

[7]If the reader is interested in seeing the Fregean account built from the ground up, they are advised to consult chapter 4 of (Stanley 2011).

have practical and demonstrative readings, as it was with Hannah the cyclist. There does not appear to be an easy answer to the question of how many modes of presentation a particular (intension of a) way has.

Let me quickly recap the discussion in formal terms. Consider 'Ali knows how to climb'. Let's say that this ascription is true at an index i if there is a way for Ali to climb at i. This would mean there is some intension x whose denotation at i, is a way of climbing $x(i)$. At i there is a spectrum of presentations of $x(i)$. An interesting question is what we can know about the spectrum of presentations of a way. For example, how does this spectrum vary as the way features in different propositions? How does it vary as the way features in different indices? Can these phenomena be understood concretely, or mostly at the symbolic level? These seem like interesting considerations, but also hint at how abstract – or, as I will argue in the next chapter, ideal – the contents of knowledge-how ascriptions are to Stanley.

3.5 PRO

(Stanley 2007 : 31) defends "the claim that all effects of extra-linguistic context on the truth-conditions of assertions are traceable to logical form". The last section showed that Stanley believes that the content of a knowledge-how ascription varies based on context (whether a demonstrative or a practical or a theoretical explanation is called for). In this section, I intend to demonstrate the connection between this hidden element, known as PRO, and the theories of propositional attitudes that were just discussed.

3.5.1 What is PRO?

Let X denote a subject, F an infinitive, and V a relation between X and the phrase 'to F'. A typical instance of PRO has the form 'X V's PRO COMP to F' – in the case of knowledge-how, this becomes 'X knows how to F'. The two major interpretations of controlled PRO that Stanley addresses are called *predicational* and *propositional*, respectively.[8] The first theory is called predicational because it considers the infinitive F to be a property of X. In this framework the infinitival phrase is formally represented by a λ-abstract.[9] The other theory is propositional because it regards controlled PRO as a pronoun. As a result, the ascription 'X V's PRO to F' is considered a relation between X and the proposition that $F(X)$. In other words, the predicational account claims that propositional attitudes are better described as attitudes towards properties, while the propositional account more conservatively regards propositional attitudes at face value. As we shall see, these accounts coincide with respect to some classes of ascriptions but differ over others. Chapter 3 of (Stanley 2011) goes into considerable detail on this point, but it is enough for us to note that

[8] See (Stanley 2011) for considerably more detail.
[9] See chapter 3 of (Stanley 2011).

neither interpretation is watertight. In some instances it is easier to consider PRO according to the predicational account while in others it is more natural to use the propositional account. Stanley himself prefers the propositional account.

3.5.2 PRO in practice

To get a feel for why PRO is used, consider the following sentences.

1. (a) Anjali asked Bikram to read *Gitanjali*.
   (b) Anjali$_i$ asked Bikram PRO$_i$ to read *Gitanjali*.
2. (a) Anjali asked Bikram$_j$ PRO$_j$ to read *Gitanjali*.

Case (1) is subject-controlled, since the subject, Anjali, is reading *Gitanjali*. Case (2), on the other hand, is object-controlled.

In the previous example, PRO indicated that the infinitival phrase was controlled by, or took its subject from, a subject that occurred elsewhere in the expression. For this reason it is called *controlled* PRO. This is the variant of PRO which corresponds to practical knowledge in Stanley's sense.

The other variety is known as *arbitrary* PRO. Arbitrary PRO indicates that the relevant infinitive has an arbitrary subject rather than one specified elsewhere in the expression. In English, this arbitrary subject is usually written as 'one'. To see this distinction in action, let's return to Stanley and Williamson's example, 'Hannah knows how to ride a bicycle'. According to them, there are four possible interpretations. These four are due to two orthogonal distinctions, one of which is controlled vs. arbitrary. The other is between deontic and epistemic readings; this does not play an important role in Stanley's analysis so I will leave it at a note.[10]

1. Hannah knows how she ought to ride a bicycle.
2. Hannah knows how one ought to ride a bicycle.
3. Hannah knows how she could ride a bicycle.
4. Hannah knows how one could ride a bicycle.

The readings involving 'she' and those involving 'one' differ by the sort of PRO in the subject position of the phrase 'to ride a bicycle'. To be explicit, this difference is given by:

1. Hannah$_i$ knows how PRO$_i$ to ride a bicycle.

[10]Stanley accounts for the distinction between deontic and epistemic readings by using Angelika Kratzer's work on modality. See, for example, her 1977 "What 'must' and 'can' must and can mean" and her 1981 "The Notional Category of Modality". This development is interesting, but I will not address it here for reasons of time and space. The issues I introduce here are, I believe, sufficient for my thesis to hold.

2. Hannah knows how PRO_{arb} to ride a bicycle.

This case illustrates the usefulness of PRO in Stanley's theory. It serves as a way to connect the syntax of ascriptions of knowledge-how to the Fregean theory of propositional attitudes. Stanley regards PRO as a syntactically postulated element, and so it is part of the logical form of the ascription in which it features. This is consistent with his view that extra-linguistic context only modifies truth-conditions through logical form.

3.6 Mention-some and mention-all readings

The difference between the epistemic and deontic readings does not directly involve PRO, but also plays a small role in the theory of Stanley (and Williamson). A more relevant consideration is the distinction between *mention-some* and *mention-all* readings. Formally, this is how the quantification over ways of knowing occurs when the abstract $\lambda x : \langle s, t \rangle$ is interpreted. The mention-all reading interprets this abstract as universal quantification over the domain at the relevant indices, while the mention-some reading interprets it as an existential quantification. If the choice of reading has an influence on the semantic content, then that should be relatable, by Stanley's convictions, to the logical form of the ascription in question. (Stanley 2011 : 175-176) considers Craige Roberts' proposal to regard both readings as one phenomenon: the difference between the two is explained by *quantifier domain restriction*. The default position here is the mention-all reading; the mention-some reading is the result of the fact that the domain that is quantified over is restricted to a single thing. However, as Stanley notes himself on (Stanley 2011 : 177), "the proposal does not capture the fact that mention-some readings seem to be *systematically* associated with certain kinds of embedded questions" and "if the distinction had simply to do with pragmatics (the choice of the quantifier domain), then we would not expect the mention-all / mention-some distinction to correlate so strongly with the particular linguistic construction chosen". Stanley believes that the mention-some reading is more natural for some expressions and less natural for others – in other words, it is a semantic property rather than a pragmatic one, and so this reading should be factored into the content of the expressions.

For this reason, Stanley provides another account of mention-some readings. His treatment simply stipulates that the denotation of a mention-some reading of "how-to-ϕ" is:

$$\lambda w.\lambda i.\exists x \; a \text{ can } \phi(x(w), w) \wedge a \text{ can } \phi(x(i), i)$$

Where x is a way of knowing, w, i are indices and a is the value of PRO. This perspective stipulates what the semantic content of a mention-some reading of a knowledge-how ascription is. It does not provide a means of determining how the choice is made between mention-some and mention-all readings. This

implies, presumably, that Stanley regards the question as pertaining to the effect of *linguistic* rather than *extra-linguistic* context on content. In this sense the question of how mention-some and mention-all readings are selected differs from the question of how PRO is determined in a knowledge-how ascription.

3.7 Summary

As I noted in the last section, Stanley shifts the focus from the distinction between knowledge-how and propositional knowledge to the distinction between different presentations of ways. I have named two of these practical and theoretical to reflect one intuitive boundary between knowledge-how and propositional knowledge. There is, however, no need to restrict our consideration of representations to only these two. Although a practically presented way of knowing may be something which is radically subjective and impossible to communicate, knowledge of such a way can still be truly ascribed by someone else (even if that someone else's explanation ends at the ascription of the way in question). For example, Anjali can ascribe to Bikram the propositional knowledge of a way to control depression. Anjali cannot write or say how Bikram controls his depression, but she can still ascribe to him that propositional knowledge. I believe that this shift of focus may be a potentially fruitful contribution of Stanley's work.

Another potentially fruitful aspect of Stanley's ascriptional perspective was made evident in the last example. It forces us to acknowledge that *situational* aspects influence the truth-conditions of knowledge-ascriptions. Stanley himself is a staunch supporter of this idea, as we saw through his work on Interest-Relative Invariantism in the last chapter. This, I believe, is a potentially healthy shift in perspective away from "Knowledge with a capital K" to knowledge as it is encountered in its usual context. It is my opinion that thinking of Things with a capital T (like Knowledge, Truth, etc.) runs the risk of reflecting and reinforcing views that dominate for reasons of social and political power rather than reflecting the broad diversity of conceptions that emerge in everyday interactions.

To get back to the main topic of this thesis, one theme has been a noticeable absence of "facts" in the discussion. First, we assumed that questions are best thought of in terms of answers without examining any data to the contrary. In the next section, I will discuss Ginzburg's take on knowledge-how: he rejects Hamblin's idea and cites examples to back his case. I will use this observation to support my view of formal semantics as a medium for epistemology rather than an authority to decide epistemological problems.

Additionally, some linguists, including Construction Grammarians, argue against the postulation of hidden syntactic elements like PRO. On their conception of linguistics, in contrast to the generative tradition, the visible, surface

phenomena of language are the primary objects of analysis. As we will see, they are more skeptical of hidden elements than Chomsky and the generativists are. Thus it does not seem to be the case that the existence of PRO is a "fact" either. If this is indeed the case, then Stanley cannot justify his Fregean position by his own reasoning. The extra-linguistic contextual phenomenon (of how the relevant proposition (or way) is presented) on the truth-conditional content of the ascription cannot be justified by appealing to its logical form.

Chapter 4

Alternative semantic approaches

4.1 Ginzburg's theory of knowledge-how

In "How to Resolve 'How To'", Jonathan Ginzburg gives an alternative formal semantic account of knowledge-how. Ginzburg's work highlights the considerable diversity in views within even the specific formal semantics of questions (indeed, the formal semantics of knowledge-how ascriptions). This is made clear in a footnote at the end of (Ginzburg 2011 : 20), where he writes "although I have argued that from a semantic point of view, the intellectualist project is empirically unsustainable, Stanley and Williamson's goal of deriving the semantics of resolutive 'how to' clauses from the semantics for resolutive wh-clauses in general is laudable". It was noted earlier that it is Stanley's step, not one of G&S, to identify how-phrases with wh-phrases. It is what allowed him to apply the G&S semantics for wh-phrases to knowledge-how ascriptions. Ginzburg agrees with Stanley consideration of the semantics of wh-phrases as a basis for his analysis of knowledge-how. On the other hand, as will be explained shortly, he disagrees with the notion of answerhood that the G&S analysis (and thereby Stanley's theory) inherits from Hamblin's postulates.

Both Karttunen and G&S are Hamblin-style in that they accept Hamblin's definition of questions in terms of exhaustiveness answerhood conditions or EACs. Ginzburg rejects the idea that Hamblin's postulates apply to all questions. As he writes in (Ginzburg 2011 : 10), "Ginzburg (1995a) and Ginzburg and Sag (2000) conclude that the motivation for identifying a question?the semantic object associated with the attitude of wondering and the speech act of asking?with an entity that encodes exhaustive answerhood conditions is flawed". In his article on 'how to', Ginzburg maintains this rejection of EACs. He summarizes his alternative in (Ginzburg 2011 : 2):

> In its stead, this approach offers a view of questions as propositional abstracts and proposes *resolvedness*, an agent-relative gen-

> eralization of exhaustiveness that has a strongly *teleological* nature, as the key notion needed for the semantics of *resolutive* complements (interrogatives embedded by, e.g., 'know', 'discover', 'learn', and 'forget').

Ginzburg observes that what is exhaustive is *agent-specific*.[1] As he writes in (Ginzburg 2011 : 12), "resolvedness is an agent-relativized generalization of exhaustiveness". He gives an example of two agents, one linguist and one politician, asking the director of a linguistics conference who attended the talks. A list of the participants is likely not an answer that would satisfy either of the agents. The linguist is likely to be satisfied by an answer which describes the demographics by area of expertise (e.g. 'cognitive phoneticians') while the politician is likely to be satisfied by an answer like 'some linguists and psychologists'. This example suggests, therefore, that the representation of a question in terms of an exhaustive collection of answers would have to depend on the agent asking the question. This is teleological in that what an agent considers resolutive depends on their interests. Ginzburg writes the following in (Ginzburg 2011 : 9).

> These data point to the fact that the semantically absolute notion of exhaustiveness is not appropriate as the notion underpinning the meaning of resolutive clauses – nonexhaustive answers can be resolving, and which answers are resolving can vary across agents even in a single discourse context. Moreover, the putative mention-all/mention-some ambiguity – appealed to by Stanley and Williamson (2001) and Roberts (2009) in their accounts of knowing how – is an artifact of EAC-based theories.

This passage is interesting for a number of reasons. For one, Ginzburg believes that nonexhaustive answers can be resolving, as evidenced by his example of the politician and the linguist. Another important note is that, as I mentioned in the last chapter, Stanley's theory does not have a clear systematic way of resolving the ambiguity between mention-some and mention-all readings. Ginzburg, by contrast, asks first whether a proposition can potentially resolve a question, and then asks whether the question does actually have a resolution (a more precise formulation of this follows in the next section). As a result, there is no ambiguity between whether the meaning of the question involves some or all of its answers.

Another reason Ginzburg rejects the Hamblin picture is that he believes that questions have a broader meaning than answerhood, or even than resolution. According to (Ginzburg 2011 : 9), "there are propositions that under no conditions resolve a question, yet are about the question, emphasizing that potential resolvedness and aboutness are distinct". The answers to the question 'Is it

[1] Agent-relativity has been a topic of discussion since the 1970s and 1980s work of Boer & Lycan.

raining?', according to a Hamblin-style theory, are 'It is raining' (or something equivalent modulo some theory of semantic content, like 'yes') and 'It is not raining' (or 'no'). But it is common (and acceptable) to reply 'Is it raining?' with 'probably'. While this does not resolve the question, it is still a reply that is about the question and, according to Ginzburg, worth considering as part of the question's content. This is another example of the considerable breadth of views within the formal semantics of questions, and, given this basic disagreement about *what a question is*, suggests that at least this area of the subject is more a medium for philosophical reasoning than an authority on the objects it treats.

Although resolvedness seems to be a more intuitive notion than answerhood in Hamblin's sense, it is worth mentioning that many of Ginzburg's views are similar to Stanley's. One important point of similarity is that both writers believe that knowledge-how should be treated as part of knowledge-wh. Recall that Stanley appropriated the G&S analysis of wh-phrases to the case of how-phrases. Ginzburg agrees with Stanley in the case of 'know', but also includes other epistemic resolutives like 'learn', 'discover' and 'forget' (Ginzburg 2011 : 3). How-phrases, when complementing 'know' and other epistemic resolutives, are propositional". They can be treated just like other wh-phrases.

However, according to Ginzburg, although how-to phrases are propositional when they are embedded by resolutives, they need not be so in general. His is the more careful claim that interrogatives *function like* propositions when embedded under epistemic resolutives like 'know' and 'discover'.[2] Indeed, he makes clear in (Ginzburg 2011: 3) that when embedded under so-called truth falsity epistemic predicates like 'believes', 'doubts', 'supposes', and 'assumes', it is easiest to assume that"interrogatives do not have a proposition-denoting manifestation". Even when embedded under epistemic resolutives like 'know', Ginzburg writes that "it is natural to assume that resolutive complements denote facts", operating under the "Vendlerian assumption (Vendler 1972; Asher 1993; Peterson 1997) that facts and true propositions are distinct". The subtle issue here is that propositions and facts, to Ginzburg, feature in identical grammatical forms but remain distinct. Ginzburg represents facts as "conversationally shared assumptions" (Ginzburg 2011 : 17); propositions need not be co-assumed in this way by everyone in a conversation.

It is not my interest to distinguish facts from propositions in this discussion. What is more important is that Ginzburg belieces that interrogatives do not, in general, denote propositions. According to (Ginzburg 2011 : 13), "since there are good reasons to assume that interrogatives never denote propositions or facts in contexts outside embedding by resolutives, resolutive embedding needs to arise by coercion. He writes in (Ginzburg 2011 : 12) that "the coercion process will be well defined if and only if the question is resolved. In other words, it is a presupposition of the coercion that there is a resolving fact for the question". What this means in the context of knowledge-how ascriptions is

[2]This is like saying that they are in the same grammatical category.

that the relevant 'how-to' clause has propositional content (i.e. denotes a fact) if and only if the question is resolved.

So, to Ginzburg, how-to phrases function like propositions when embedded under resolutives. A natural follow-up question is asked and answered by Ginzburg himself in (Ginzburg 2011 : 218): "Which facts? Facts that resolve the question".

4.1.1 Resolvedness and ontological commitments

Ginzburg uses the notion of resolvedness to invert the Hamblin picture of questions. It is worth mentioning that the representation of Ginzburg's questions are not so different, in some sense, from the representation favoured by Karttunen and G&S. Ginzburg considers questions as *propositional abstracts*. Hamblin, Karttunen, and G&S define questions as classes of (true) answers. Ginzburg, on the other hand, starts in (Ginzburg 2011 : 12) with a question and uses it to define "a class of true propositions, each of which is *potentially* resolving". Whether or not a potentially resolving answer is actually a resolving answer depends on context, as well as some agent-dependent conditions: *information state* and *desired outcome*. Ginzburg puts this in the following way in (Ginzburg 2011 : 12).

> p resolves q relative to B's information state I iff p is a potentially resolving answer to q, and relative to B's information state I p leads to B's desired outcome o.

This notion, Ginzburg writes on the same page, collapses to exhaustiveness under certain assumptions. This collapse presumably does not occur under all conditions, and even if it did, Ginzburg's account would still differ from Hamblin-based theories on the grounds of where it places ontological emphasis. It differs from Stanley's account in what actually counts as a resolution in a given context depends on the information state and desired outcome of the asking agent. It is worth mentioning that Groenendijk & Stokhof, in their 1984 dissertation, do consider information states in their consideration of questions. They still maintain the Hamblin picture, but consider information as a set of states. Very briefly, an answer is in accordance with the information if the information states fall within the partition of logical space corresponding to that answer. Stanley does not discuss this, however, and so it is not relevant to the semantic comparison at issue here.

Ginzburg constructs his formal theory in what he calls *Type Theory with Records* or TTR. The ontology at play is given in (Ginzburg 2011 : 10), as one which "involves propositions and other abstract semantic entities (e.g, outcomes, the denotata of imperatives; facts, the denotata of exclamatives) being constructed in terms of "concrete" entities of the ontology such as situations and situation types".

Situations are the focus of situational semantics, a variant developed by Jon Barwise in *Scenes and Other Situations* (1981) and Barwise & Perry in *Situations and Attitudes* (1983). Situations are novel with respect to what we have so far seen in that they only capture *parts* of the world; in particular, those parts of the world that are relevant to the conversation under consideration. An expression like 'Anjali read a book" involves only Anjali, reading, and a book. This differs markedly from the possible-worlds conception, which considers the truth of expressions with respect to entire worlds. A concrete example of a situation follows the next two paragraphs. The relationship between propositions and situations is that a situation can be associated to – built out of – a proposition. How this happens will be clear in the example. *Outcomes* are, to Ginzburg, "closely related to propositions, with the main difference being temporal – outcomes are intrinsically futurate but with temporal dimension that is typically unanchored (at speech time), which makes them useful entities for reasoning about future action" (Ginzburg 2011 : 15). Outcomes differ from propositions because "truth is not applicable to such entities; what is applicable is the notion of being fulfilled" (Ginzburg 2011 : 15). Ginzburg also makes space for *abilities* or skills, which (Ginzburg 2011 : 16) suggest are "functions relating situations where a certain effect obtains to their preconditions". For example, as Ginzburg writes on the same page, the representation of Bo's swimming ability "maps situations in which Bo is swimming to situations in which his hands and legs are moving at that time". He also discusses *information states*, both as public context and private information, in (Ginzburg 2011 : 17). The details are not as important as the fact that these types of thing are all recognized and incorporated within a system. The interrelation of these types that is presently of concern is given by the definition of resolvedness. Information states and outcomes are used to resolve questions; the potential resolutions of questions are propositions.

That propositions, outcomes, and abilities have different satisfaction conditions is not of concern to Ginzburg's model, since all the relevant forms of satisfaction can be represented in terms of *witnessing*. A witness for a type T is an element a of that type.[3] This could be a true proposition witnessing a proposition type, an obtained outcome witnessing an outcome type, and so on. I will not outline the theory in its entirety, but hope that this gives enough of the gist of Ginzburg's ideas.

TTR must be able to handle these sort of constructions. Those familiar with mathematical logic and/or homotopy type theory might be interested to note that this theory is "a model-theoretic descendent of Martin-Löf Type Theory" (Ginzburg 2011 : 11). Like Martin-Löf's theory, it comes equipped with some basic types and has rules by which *dependent* types can be defined. Dependent types are types which are constructed by some rule from other, already existing types. An ascription is understood as a *situation*, which Ginzburg models as an

[3]See (Ginzburg 2011 : 13-15) for details.

object he calls a *record* in TTR. A record is an ordered tuple. Each successive entry of a record can depend on the preceding entries. A *record type* is a tuple to which a record may belong, and, again, each successive entry of a record type can be a type which depends on the preceding entries. These ideas are much clearer in an example.

Example 4.1.1. In (Ginzburg 2011 : 14), Ginzburg represents the type of a situation with a woman riding a bicycle as a tuple indicating variables of different types. This situation can be formalized in TTR by employing three basic types, individuals (IND), times (TIME) and location (LOC), and then by constructing dependent types from these three. To be more precise, Ginzburg introduces individual variables x, y : IND, a time variable $time$: TIME, and a location variable loc : LOC. c_1 : woman(x), c_2 : bicycle(y), and c_3 : ride($x, y,$ time, loc). The situation type is obtained by arranging these items in order of dependency.

A witness for this type would be a tuple specifying individuals a, b such that $x = a$ and $y = b$, a time t_0 such that time $= t_0$, a location l_0 such that loc $= l_0$, and propositions $p_1 =$ woman$(a), p_2 =$ bicycle$(b), p_3 =$ ride(a, b, t_0, l_0) such that $c_i = p_i$ $(i = 1, 2, 3)$. The witnessing situation record is constructed by arranging these entries in order of dependency.

The way that propositions are constructed from existing situation types by means of relations (which serve as type-constructors) is quite clear from the example. The propositions p_i are true if and only if there are witnesses in the types on which they depend which in turn allow them to witness their proposition type.

I have not covered any of the seriously heavy lifting in Ginzburg's theory, but rather only sketched his ontological assumptions and his general goals. In (Ginzburg 2011 : 16-17), Ginzburg writes that "the general setting for such a theory needs to be a theory of interaction in which agents interact with each other". The analysis "needs to make reference to the cognitive or the *information* states of the participants, given that resolvedness is a notion relativized by the desired outcomes and the inferential abilities of agents. Moreover, we also need a means of explicating how presuppositions concerning the resolvedness of questions enter into context." Understanding how all of this fits into Ginzburg's picture is a worthy endeavour which would take us too far afield from the central topic of this thesis. Interested readers are directed to his text.

4.1.2 Methodological reflections

Recall the example of the linguistics conference which Ginzburg used to demonstrate the fact that resolvedness depends on who asks the question. There is some ground from which Stanley could make a counter-argument. As a Fregean, he believes that individuals are only accessible via modes of presentation. In Ginzburg's example, the politician may not consider the list of all people present

an answer, but that is simply because of the way that those individuals are presented. Identifying the individuals designated by their names with a different property, like their faculty or departmental affiliation, presents the same answer more favourably to the questioner. What is unfortunate, according to this reply, is that the conference organizer chose to present the content the way that he or she did. It is in *this* sense that they gave the wrong answer.

It is clear from the previous discussion of Ginzburg that his take on how knowledge-how should be semantically understood differs considerably from Stanley's. His perspective differs in a number of ways: for one, he has a more pragmatic idea of what answers a question, which relates to some work by G&S but not that appropriated by Stanley. He frames his ideas in a theory which does not rely on possible-worlds, but instead only captures the situation at hand; that is, the conversation itself as well as the relevant information states. Unlike Stanley, Ginzburg's system adopts not only propositions but also outcomes and abilities.

This section provides evidence for my thesis that the role of formal semantics in this epistemological problem is one that is closer to a medium than an authority. One reason is the considerable divergence in the ontology that Ginzburg and Stanley assume. Another is that this ontological difference carries over to a difference in their epistemological conclusions. Stanley reaches an intellectualist conclusion while Ginzburg suggests that 'know' can combine with different types of entity, thereby contradicting intellectualism (see (Ginzburg 2011 : 1-2)). The fact that these two thinkers look at the same problem quite differently and come to opposite conclusions using "formal semantic methods" suggests that those methods are considerably more diverse and less univocal than something like a factual authority. On the other hand, it is clear from the previous exposition that philosophical reasoning can proceed via reasoning about formalisms, hence the plausibility of the "medium-picture".

4.2 Knowledge-how and Construction Grammar

In "Knowledge Ascription by Grammatical Construction", Laura Michaelis provides an alternative linguistic account of knowledge-how. Although her take on this question is very interesting and merits study in its own right, the primary reason I have included it in this thesis is that she writes from a background which rejects some of the syntactic theory that Stanley assumes. In particular, her school of thought rejects the postulation of hidden syntactic elements like PRO. While Stanley employed the compositional G&S theory to straightforwardly relate knowledge to 'how to' phrases, Michaelis believes that the content of the verb 'know' is often altered in combination with other clauses. She broadens the scope of analysis beyond the word 'know' to include 'teach' and 'learn'. These three epistemic resolutives are able to take 'how-to' complements, unlike other resolutives – indeed, the fact that 'know' could do so allowed Stanley to

apply the G&S analysis – and so have reason to be treated similarly from a semantic perspective. This proposal may be debatable, but strikes me as reasonable: it seems clear that we can ascribe knowledge without explicitly using the verb 'know'. Intuitively, if x teaches y something, then there is something that x knows and which y will know if the process of teaching is successful. Similarly, if x learns something, then there is something, at the end of the process of knowing, that x knows. There is no need, I believe, to suppose that knowledge-how is exhausted by the analysis of ascriptions which explicitly look like 'X knows how to F'.[4]

In (Michaelis 2011 : 2), Michaelis clarifies her position. According to her, the combinatory potential of phrases can vary based on syntactic context. As evidence for this point, she considers the fact that the first of the following knowledge-ascriptions implies neither of the others.

1. I learned that wider tires have better traction.
2. I learned to change a tire.
3. I learned how to change a tire.

According to Michaelis, 'learn' relates a person to a proposition in the first case, a person to a procedure in the second, and a person to a method of performing a procedure in the third. "In short", she writes, "the argument is that a verb assigns different roles according to its syntactic context". This view is clearly quite different from the one espoused by Stanley, who believes that the embedded 'how to' question in a knowledge-how ascription always denotes a proposition. It bears somewhat more resemblance to Ginzburg's view, which holds that 'know' (and other epistemic resolutives) coerces interrogatives into denoting propositions, but does not agree with Stanley that interrogatives denote propositions in general, regardless of what they are embedded as. Differentiating Michaelis from Ginzburg is not the focus of this section, but their differences will become apparent in the following paragraphs.

Michaelis differs from Stanley (and Ginzburg) because she works from the position of *construction grammar*. The focus of this subject, as the name suggests, is on *constructions*. (Goldberg 2003 : 219) defines a construction as a "any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other constructions recognized to exist." Let's compare this perspective with (Hornsby & Stanley 2005 : 136) where Stanley writes that "the view I favour is the fairly standard one that semantic competence amounts to grasp of a compositional semantic theory for that language." Goldberg did not suggest that there is no compositional semantic aspect to language, so construction grammar

[4]This concern coalesces with the critique against the focus on words in semantic externalism. Meaning is not necessarily "localized" in words.

is not totally inconsistent with Stanley's view. The point of disagreement is better thought of in terms of *scope*. The objects of construction grammar are those linguistic items which "are not strictly predictable" from their components. The situation can then be summarized thusly: Stanley believes that *all* of semantic competence is the grasp of a compositional semantic theory; construction grammarians are interested in studying those linguistic patterns which contradict his belief. Construction grammarians see those aspects of semantics which can be understood compositionally as a particularly nice case, but do not assume that compositionality holds in general.

Construction grammar also disagrees with a number of aspects of that generative tradition in grammar which is most closely identified with Chomsky. (Goldberg 2003 : 219) is clear enough to make this her third tenet of construction grammar: "*Tenet 3.* A 'what you see is what you get' approach to syntactic form is adopted: no underlying levels of syntax or any phonologically empty elements are posited." Many who adopt a compositional formal semantics are also skeptical of the use of syntactic elements that do not feature in surface form.[5] The compositionality and acceptance of PRO can therefore be seen as independent adoptions on Stanley's part. Construction grammar's rejection of phonologically empty elements is considerably more problematic for Stanley's theory than its rejection of compositionality. Perhaps on a view which only rejects the fact that compositionality applies to all of semantics could still accommodate Stanley's theory of knowledge-how as an account of those knowledge-how phenomena whose ascriptions behave compositionally. However, Stanley needs PRO for his Fregean theory of propositional attitudes to gel with his view that extra-linguistic contextual effects on truth-conditions must go via logical form. Without it, he would need to provide another path to his point or would have to concede the existence of a linguistic gap in his reasoning.

Whether construction grammar is more plausible than Stanley's approach to knowledge-how is a question that I believe is best answered by thorough consideration of data. I am neither equipped nor able to provide such a study here. My humbler intention is to make clear how methodologically diverse linguistic analyses of knowledge-how can be. Construction grammar gives reason to suggest that PRO should not simply be assumed to be part of "standard" syntactic theory and therefore regarded as a solid foundation for a theory. Stanley assumes that PRO is an uncontroversial part of syntactic theory, which does not appear to be the case. From what I have said earlier, the validity of his account of knowledge-how depends crucially on PRO. My use of this limited slice of the construction grammarian's view suggests that Stanley's theory ought to be understood as *conditional on* the acceptance of PRO. This fits with my overall theme: semantics does not feature in this epistemological application as an authority to decide what is the right interpretation of lexical items.

[5] Pauline Jacobson and Emmon Bach are among these.

Chapter 5

Conclusions

5.1 Stanley's semantic content as an idealization

The concept of semantic content is central to the semantic theories that Stanley employs in his account of knowledge-how. It is quite clear that the notion of semantic content found in these theories is not, at least explicitly, meaning as we encounter it in everyday life. It is clear that semantic content as it is presented in the Hamblin-style theories of Karttunen and G&S may resemble natural meanings in some respects. Despite this, it is clear that semantic content is *not* simply what we think of as meaning in the everyday sense.[1] In a series of recent articles, Stokhof and van Lambalgen (henceforth S&vL) distinguish *abstractions* from *idealizations* and use this distinction to characterize empirical science. According to them, empirical sciences tend to employ abstractions but not idealizations. I believe that the notion of semantic content that Stanley employs is an idealized, not an abstract, version of natural language meaning. The centrality of this concept in the formal semantic project, I believe, is a significant strike against the empirical reading of Stanley's work.

5.1.1 Evidence from comparison with Ginzburg

Ginzburg's account of questions emphasized that what counts as a resolution to a question is often agent-specific. This consideration, I believe, sheds light on an idealistic aspect of Stanley's conception of semantic content. While it is worth mentioning that Stanley's theory of knowledge-ascription does flex enough to include interest-variance, by committing to G&S semantics for his theory of questions, he is forced into accepting Hamblin's definition of what a question is.[2] For this reason, the following arguments against the theory of the semantic content of questions induced by accepting Hamblin's postulates

[1] It seems awfully difficult, if not impossible, to say precisely what meaning in the everyday sense is, anyway.

[2] I have already noted that Stanley does not use the pragmatic notion of answerhood that G&S introduce in their 1984 thesis.

are also arguments against whatever larger theory of content is built around it. For this reason I believe that the following arguments indicate the idealized nature of Stanley's semantic content as they demonstrate the idealized nature of content in Hamblin-based theories of questions.

I will now provide some reasons to support my belief that Hamblin-based theories of questions assume an idealized notion of semantic content. Let me first point out that this induced notion of semantic content is not an *abstraction* in S&vL's sense. According to (Stokhof & van Lambalgen : 3),

> Features of a phenomenon that are abstracted are real features that at some point in time are considered to be too complex or too intractable, or, in some cases, not sufficiently relevant, to be taken into account in conducting a scientific inquiry into the nature of the phenomenon. A decision to abstract away from a feature is thus context- dependent, and reflects various types of constraints that may obtain at a particular moment in time, relating to the availability and accuracy of instrumentation, availability and access to data, and so on. What needs to be pointed out is that abstraction is an intentional move: the features that are abstracted from are acknowledged as real, and they do occur, albeit in a special way, in subsequent theories, and, being actual features of the phenomenon, they will manifest themselves in experiment and observation.

In Ginzburg's example, is the difference between what the politician and what the linguist consider a resolution to their question sufficiently relevant to the semantic content of their question? In the Hamblin-picture, the semantic content of a question is the content of its true answers. Thus, in the Hamblin-picture, truth rather than resolvedness is relevant in determining the content of a question. Every answer in the case of the politician at a linguistics conference is true in the actual world: 'linguists and psychologists' is true, as is a a list of participants. However, according to Stanley's treatment, who-questions quantify over individuals and so the answers correspond naturally to the list of participants, but not to the answer 'linguists and philosophers'. This is because the notion of answerhood that Stanley adopts does not account for attributes of the individuals (like their professions). These attributes are accounted for as modes of presentation: to a Fregean, 'Hesperus' and 'Phosphorus' denote the same object, so 'Linguist A' and 'a linguist' may also denote the same object. This is strategy is not clearly inconsistent. However, I do believe that it is more an idealization than an abstraction. This claim boils down to my belief that the content of a question may depend on who asks it. Questions may have standing meanings – for example, 'Who is at the conference?' may have the standing meaning of a list of all the members – but they have standing meanings for a reason. Let me note at this point that in Ginzburg's example the question is being heard and interpreted by the conference organizer. It is reasonable for him to think of the standing meaning of this question as a request for names

of attendees. I believe that this is tied to his place in the linguistic community. Let us suppose that instead of a conference organizer the one answering questions is the politician's secretary Jim, who only knows of this conference as an item in the politician's calendar. He knows that the politician has to go to a conference of linguists and psychologists, but nothing more. The politician, having a day stocked full of commitments, has forgotten who is going to be at the conference, and calls up her secretary. The secretary answers 'some linguists and psychologists', which resolves the question for the politician. Does the secretary present the same content to the politician as the conference organizer does? This seems unintuitive. The secretary has no idea about the names of the people present, he simply read what was on the calendar, which happened to be the same as the conference organizer's presentation (i.e. the names). Thus it does not make sense to say that the secretary is really presenting the same answer as the conference organizer; it is only that the modes of presentation coincide in this case. According to Stanley's theory, then, the secretary is not answering the politician's question at all. I do not think this is an intuitive conclusion. Stanley's theory could accommodate the fact that the secretary does answer *some* question the politician asks by considering it a presentation of a different question, like 'on the calendar, who does it say will be at the conference I am attending?'. Even adopting such a solution, I believe, compels Stanley to accept that the semantic content of a question is to some degree agent-specific. In an everyday sense, 'Who is attending the conference?' *is a question*. Stanley conceptualizes this single everyday question as a different question (according to his definition) depending on whether the politician asks her secretary or whether she asks the conference organizer. It seems intuitive to interpret this as an instance of agent-specificity. It is unclear how this difference can be accounted for without agent-specificity. Any solution, it seems, will establish Stanley's notion of the content of a question as quite ideal with respect to the everyday idea of what a question is.

It is clear, therefore, that agent-specificity is not irrelevant to the semantic content of a question. This still leaves the possibility open for agent-specificity to either be too complex, too intractable, or both, to have been taken into account. One obvious argument against this position is that there are existing theories which address precisely the point that we are suggesting may be too complex or intractable: Ginzburg's account *starts* with the problem of the agent-specificity of resolvedness. Another argument against this position is that abstracting away agent-specificity does not seem to have been a deliberate move in the development of the Hamblin-style semantic theories.

I believe that the agent-specific nature of what counts as a resolution to a question is idealized, not abstracted, away in Hamblin-style models. According to (Stokhof & van Lambalgen 2014 : 4) "features that are abstracted are typically quantitative in nature". The agent-specificity of resolvedness does *not* appear to be at all quantitative. It may be objected that Ginzburg characterizes resolution in quantitative terms when he uses agent-specific information states and desired outcomes. However, the presence of numbers does not make

the phenomenon modelled quantitative. While some portions can be modelled quantitatively, for the procedure to be carried out at all there must exist at least one *potentially resolving proposition*. Whether or not a proposition potentially resolves a question for a given agent is qualitative, not quantitative. (Stokhof & van Lambalgen 2014 : 4) suggest that qualitative features are typically not abstracted away. Qualitative features are typically *idealized* away. On the same page, S&vL note that idealization creates an "ontological gap" between the phenomenon (in this case, meaning) and idealized object (in this case, semantic content). The agent-specificity of resolvedness, I believe, is a commonly occurring phenomenon in everyday discourse. A justification for this point can be found in a basic text in sociolinguistics, but I do not think that it is necessary to look that far. In any cafe, it is clear that "what would you like?" has agent-specific resolution conditions. "A coffee" is a strange reply if the question is asked by another customer, but is a resolution when asked by the cashier.

The fact that the agent-specificity of resolvedness is absent in Hamblin-based semantic theories suggests that there is a considerable gap between meaning as an everyday phenomenon and meaning as Stanley-style semantic content. Before coming to this conclusion, however, it is worth noting that Stanley does not accept Hamblin or Karttunen's semantics as they are. Rather, he interprets the G&S account in Fregean terms. This Fregean aspect of his theory ought to be considered before we make any conclusions. Much of the heavy lifting done by agent-specific resolvedness can be done by Fregean modes of presentation: the resolving proposition may be presented differently to different agents. Take the example of the politician at the linguistics conference. Perhaps the list of participants is presented differently to the politician as "some linguists and psychologists". I cannot think of why it is impossible for a Fregean account to simultaneously maintain a public concept of semantic content and account for agent-specific resolvedness. It is, however, no clearer how such an account would go if it exists. What is the public, invariant semantic content of the question "what would you like?", for example? Someone who supports Stanley's account would first say that it consists of all the question's true answers. What would one of these answers look like? I claim: the proposition corresponding to "a coffee" said in the context of interaction with the cashier at a cafe. Since (at least) this one presentation of the proposition corresponding to "a coffee" resolves (answers) the question, the proposition is a constituent of the question.

What this proposition says outside of this very specific context is a mystery, however. The only understanding we have of the semantic content of this proposition is that which comes from the situation we forced it to model. It is unclear whether or not this minimality or vacuousness is characteristic of Stanley's semantic content. If the assumption of Fregeanism serves more as a patch than as a substantial addition, it is unclear why we should adopt Stanley's way of thinking over Ginzburg's.

5.1.2 Other evidence

The paper "Abstractions and Idealizations" (Stokhof & van Lambalgen 2010 : 12) lays out a number of criteria which characterize idealizations. In addition to the omission of qualitative features which I discussed in the context of Ginzburg and agent-specificity, one characteristic S&vL ascribe to idealizations is that they are *ontological*. The ontological character of Stanley's moves was made very clear in the previous chapter of this text: indeed, I cast his use of formal semantics as an ontological move to a space where ways find a natural place.[3] This fits S&vL's characterization of idealizations to a tee: in (Stokhof & van Lambalgen 2014 : 4) they write that "in a quite literal sense idealisation is an ontological move, rather than an epistemological one like abstraction: it changes the subject." I think that there has been enough said in the course of this essay to justify the notion that Stanley uses formal methods for ontological purposes. I will move on because I believe that we have actually seen multiple aspects of the ideal nature of Stanley's semantic content that can be described as ontological moves, or "changing the subject".

Indeed, the very first move Stanley makes is an ontological one: he goes from knowledge-how *phenomena* to ascriptions of knowledge-how. I have written elsewhere in this thesis that there are benefits to making such a move. Benefits aside, however, it is still changing the subject. The next move, from a linguistic point of view, is common to the much of the generative tradition. This is clear when it is compared to construction grammar. Construction grammarians take, to re-quote Goldberg, a "what you see is what you get" approach to syntax. They do not postulate hidden elements like PRO, nor do they assume that principles like compositionality hold for all of language. By focusing on constructions – pairings of forms and meanings – they do not idealize language in the same way that generativists, who assume a distinction between competence and performance, do. This is made clear in (Stokhof & van Lambalgen 2010 : 11), who make the following comment on Chomsky:

> What happens here is that competence, regarded as the proper object of study of linguistics, is constructed from what we can observe, i.e., everyday use of language, by stripping it from a number of features, such as memory limitations, mistakes, (communicative) goals, attention shifts, and so on. In other words, Chomsky constructs from observable language use a concept of linguistic competence by simply ignoring a number of its actual, real properties. In that way a new object of study is created, i.e., an object that has an ontological status that differs from that of the original one.

I will now put the objections against the generativist tradition as a whole to one side and focus more specifically on some of the assumptions that Stanley

[3] It may be objected that Ginzburg's theory is also idealistic in this respect. I do not disagree, but I am interested in Stanley's theory and not Ginzburg's. Ginzburg's work only plays the part of a point of comparison in my analysis.

takes up. In particular, I would like to return briefly to semantic externalism. I believe that here, too, he subtly changes the subject by localizing the meaning of expressions in words. The task of semantics is then reduced to understanding the meanings of words, which he does by assuming a possible-worlds semantics, and combining the results compositionally. Even assuming compositionality, we return to Chomsky's objection: there is no reason to assume that meaning does localize in this way. To make such an assumption is to change the subject. This is, I believe, an additional ontological move by which Stanley distances himself from the linguistic phenomena at hand and moves closer towards idealized semantic content.

The assumption of this localization of meaning does not actually require semantic externalism. It is not so much a consequence of the externalist portion of the semantics Stanley assumes as it is a consequence of the logical tradition's influence on that semantics. Words are the smallest lexical unit that Stanley considered as a possible bearer of meaning – he considered that, perhaps, 'know how' was a distinct unit from 'know', but presupposed that words are the locus of meaning. Words, not syllables or characters, are the things that get translated into formal expressions. This is sufficient for the localization of meaning but does not imply semantic externalism.

5.2 Speculations on semantics and philosophy

I have pointed out a number of moves away from knowledge-how phenomena and towards idealized semantic content that I believe are accurately characterized as ontological. I went into the most detail regarding a particular move away from agent-specificity in determining the meaning of a question, but also noted a number of other moves that occur both before and after the idealization of questions. The combination of all of these steps, I believe, is sufficient to demonstrate the idealized nature of the semantic content of knowledge-how ascriptions according to Stanley.

What I would now like to turn to is the question of what this case study indicates about the use of (formal) semantic methods in philosophy generally. Let me return to the analogy between knowledge and jade; let me also assume that in there are philosophical situations where metallurgic arguments are authoritative.[4] I have argued that semantics does not play an authoritative role in Stanley's epistemology. Indeed, even syntax does not play such a role. Stanley bases the Fregean part of his theory – a necessary portion of it given the theory of questions he adopts – on the acceptance of PRO in syntactic theory, but as the last chapter has shown, hidden elements like PRO are not generally accepted among linguists. As a result, Stanley's theory is conditional on the acceptance of PRO. A similar point applies to Stanley's semantics of questions. He adopts one perspective among many, so it is unclear why his argument should have any more authority than one which did not apply linguistic methods at all. This

[4] See Stanley's quote in section 1.2 of this thesis if you have forgotten the analogy.

suggests that this aspect of linguistic theory is in itself "philosophical" inasmuch as it contains nonempirical elements. Whether or not this impacts the status of linguistic theory as an authority in this context is beyond the scope of my work here, but I do believe this point is worth noting. There is first a principled question of whether empirical theories have authority in the first place. I am agnostic on that point, but will assume the answer is yes for the time being, since Stanley does seem to consider empirical science authoritative in philosophy to some extent. The presence of competing theories – Stanley's, Ginzburg's, and Michaelis' accounts are an example in the case of knowledge-how – suggests, from an outsider's point of view, that there is no obviously authoritative view. This conclusion is highly speculative, however; I am talking around a sociological characterization of authority which I am not equipped to detail here. The notion of the authority of empirical scientific arguments in philosophy is a topic worth investigating, both in general and in the case of linguistics in particular. I hope that my case study has provided some insight into why this particular application is not authoritative, and thereby at least provided some negative criteria.

From a more typically semantic perspective, it is worth asking what authority a semantic argument can have if it only captures an idealized version of the linguistic phenomena at hand. I have argued that Stanley's own notion of semantic content is idealized with respect to other semantic theories which themselves may (or may not) be idealized. This way of speaking suggests that theories may be ranked in terms of their idealization. If any such ranking is possible, it is only conceivable as a partial order. It makes sense to say that one theory is more ideal than another, but only with respect to a particular aspect – in the case of Stanley and Ginzburg, that aspect is agent-specificity. Although Ginzburg's theory is not the focus of my work, more digging may reveal an aspect where his account is more ideal than Stanley's. There is, therefore, considerably more work to be done before establishing even a partial order between theories. It is, nevertheless, another interesting question. Even the basic methods which I have employed to some extent here – for instance, in judging whether 'know' should be grouped with 'learn' and 'teach' – are questionable when thought of in the broad sense of language. (Groenendijk & Stokhof 1982 : 182) write that "verbs such as wonder ... take only wh-complements". An example like 'Niraj wonders that the sky is blue' is often regarded as a demonstration of the fact that 'wonder' does not take 'that' as a complement. This is definitely a sentence that a schoolteacher would correct a student for uttering. Despite this, it still has sensible interpretations: for instance, it could be synonymous with a wh-sentence like 'Niraj wonders how the sky is blue' or 'Niraj wonders why the sky is blue', or a sentence like 'Niraj wonders about the blueness of the sky'. In this sense it is not an "unacceptable" expression. In everyday conversation it is not too hard to understand the meaning of such an expression. To set up such a prescriptive notion of what is grammatical and what is not is difficult; it would require a thorough characterization of how language is used across a broad sample of linguistic groups, rather than the schoolteacher's definition of

which expressions make sense. Factoring this is not as difficult in theory as it would be in practice: the judgement of the combinatory potential of a phrase can be regarded as dependent on the linguistic community in which that phrase is used, for instance. Stanley's account can then be thought of as one which assumes the grammatical conventions of the particular variant of English in which he writes. Such an account would have to relate the grammatical conventions of different linguistic communities to eachother if it hopes to preserve a notion of universal grammar. This brief speculation illustrates that I am not equipped to get into this discussion at this point, but I believe it is an interesting question nonetheless.

The idea that semantics can inform philosophy is a good one. I repeat that I agree with the motivations behind Stanley's interest-relative theory of propositional knowledge: by focusing on how knowledge features in everyday discourse, he manages to get a more practical theory. As I said already, I prefer such a perspective to one which studies Things with a capital T, which may absorb, reflect and be distorted by the influence of social, institutional and political power. By relying on a method of distinguishing sensible from nonsense expressions which idealizes everyday discourse, however, I believe such an approach goes against its own motivations. The questions raised here are, I believe, interesting and valid considerations. Resolving them, however, is an issue that I have not even managed to get started on.

Bibliography

[1] Chomsky, N. (1968). *Language and Mind* (third ed.). Cambridge University Press.

[2] Chomsky, N. (1998). *New Horizons in the Study of Language and Mind*. Cambridge: Cambridge University Press.

[3] Davidson, D. (1986). A nice derangement of epitaphs. In *Truth, Language, and History: Philosophical Essays*, Volume 5. Oxford Scholarship Online.

[4] Eco, U. (1995). *The Search for the Perfect Language*. Oxford: Blackwell.

[5] Ginzburg, J. (2011). How to resolve 'how to'. In J. Bengson and M. Moffett (Eds.), *Knowing How: Essays on Knowledge, Mind, and Action*, pp. 215–243. Oxford University Press.

[6] Glick, E. (2009, sep). *Practical Knowledge and Abilities*. Ph. D. thesis, Reed College.

[7] Glick, E. (2012). Abilities and know-how attributions. *New Essays on Knowledge Ascriptions*.

[8] Groenendijk, J. and M. Stokhof (1982). Semantic analysis of wh-complements. *Linguistics and Philosophy 5*, 175–233.

[9] Groenendijk, J. and M. Stokhof (1984). *Studies on the Semantics of Questions and the Pragmatics of Answers*. Ph. D. thesis, Universiteit van Amsterdam.

[10] Groenendijk, J. and M. Stokhof (1997). *Handbook of Logic and Language*, Chapter Questions. Elsevier.

[11] Groenendijk, J. and M. Stokhof (2005). Why compositionality? In G. Carlson and J. Pelletier (Eds.), *Reference and Quantification: The Partee Effect*, pp. 83–106. Stanford: CSLI Press.

[12] Hamblin, C. L. (1973). Questions in montague english. *Foundations of Language 10*(1), 41–53.

[13] Hawley, K. (2003). Knowledge how and success. *American Philosophical Quarterly 40*(1), 19–31.

[14] Hornsby, J. and J. Stanley (2005). Semantic knowledge and practical knowledge. *Aristotelian Society Supplementary Volume 79*(1), 107–145.

[15] Karttunen, L. (1977). Syntax and semantics of questions. *Linguistics and Philosophy 1*, 1–44.

[16] King, J. and J. Stanley (2005). Semantics, pragmatics, and the role of semantic content. *Semantics Versus Pragmatics*, 111–164.

[17] Kratzer, A. (2016, apr). Situations in natural language semantics.

[18] Michaelis, L. A. (2011). Knowledge ascription by grammatical construction. In J. Bengson and M. Moffett (Eds.), *Knowing How: Essays on Knowledge, Mind, and Action*, pp. 261–281. Oxford University Press.

[19] Nagel, J. (2013). Knowledge as a mental state. *Oxford Studies in Epistemology 4*.

[20] Olson, G. and L. Faigley (1991). A conversation with noam chomsky. *Journal of Advanced Composition 11*(1), 1–35.

[21] Partee, B. (1980). Semantics - mathematics or psychology? In *Semantics from Different Points of View*, pp. 1–14. Berlin: Springer-Verlag.

[22] Partee, B. (1988). Possible worlds in model-theoretic semantics: A linguistic perspective. In W. de Gruyter (Ed.), *Possible Worlds in Humanities, Arts, and Sciences: Proceedings of Nobel Symposium*, Volume 65, Berlin, New York, pp. 93–123. Springer-Verlag.

[23] Pietrowski, P. (2005). Meaning before truth. In G. P. . G. Peters (Ed.), *Contextualism in Philosophy*. OUP.

[24] Pietrowski, P. (2010). Concepts, meanings, and truth: First nature, second nature, and hard work. *Mind and Language 25*, 247–278.

[25] Pietrowski, P. (forthcoming). Semantic internalism. In J. McGilvray (Ed.), *The Cambridge Companion to Chomsky*. Cambridge University Press.

[26] Speaks, J. (2016, apr). Theories of meaning.

[27] Stanley, J. (2000). Context and logical form. *Linguistics and Philosophy 23*(4), 393–434.

[28] Stanley, J. (2005). *Knowledge and Practical Interests*. Oxford: Oxford University Press.

[29] Stanley, J. (2011). *Know How*. Oxford: Oxford University Press.

[30] Stanley, J. and T. Williamson (2001). Knowing how. *The Journal of Philosophy 98*(8), 411–444.

[31] Stokhof, M. (2002). Meaning, interpretation, and semantics. In J. v. B. . P. S. d. L. D. Barker-Plummer, D. Beaver (Ed.), *Words, Proofs, and Diagrams*, pp. 217–240. Stanford: CSLI Press.

[32] Stokhof, M. (2006). The future of semantics? *Theoretical Linguistics 32*, 91–100.

[33] Stokhof, M. (2007). Hand or hammer? on formal and natural languages in semantics. *The Journal of Indian Philosophy 35*(5-6), 597–626.

[34] Stokhof, M. (2008a). The architecture of meaning: Wittgenstein's tractatus and formal semantics. In D. L. . E. Zamuner (Ed.), *Wittgenstein's Enduring Arguments*, pp. 211–244. London: Routledge.

[35] Stokhof, M. (2008b). The company of objects. In T. M. . K. Andreasen (Ed.), *Inventory*, pp. 13–16, 27–30. Johan Deumens.

[36] Stokhof, M. (2013). Formal semantics and wittgenstein: An alternative? *The Monist 96*(2), 205–231.

[37] Stokhof, M. and M. van Lambalgen (2011). Abstractions and idealisations: the construction of modern linguistics. *Theoretical Linguistics 37*(1-2), 1–26.

[38] Williamson, T. (2000). *Knowledge and its Limits*. Oxford: Oxford University Press.