On the Psychological Reality of Minimal Propositions: Minimalism and Williams Syndrome

David W. Agler

1. Minimalism and Contextualism

As it is sometimes understood, **semantics** is concerned with the *literal meaning* of *words* and the meaning of the way they are put together in *sentences types*, i.e. the meaning that is the result of grammatical and lexical features of the sentence. **Pragmatics** is concerned with what speakers mean by their *utterances* of sentences in context (see Lyons 1977:643; Palmer 1981:8; Griffiths 2006:4-6). Thus, whereas semantics assigns **literal meaning** to *sentences*, which are the abstract objects of syntactic theory, pragmatics assigns **speech act content** (speaker meaning) to *utterances*, which are concrete expressions of these abstract objects.[1] But, the meaning of many utterances depends upon context and how best to characterize how an utterance's meaning relative to context is problematic.

Let's call any development of the literal meaning of a sentence by using elements or features from the context in which a sentence is uttered, a **contextual enrichment**. There appears are two different types of contextual enrichments. First, there are **linguistically-directed enrichments** that are mandated (or driven) by the meaning (or in Kaplan's term 'character'[2]) of

[1] The distinction between pragmatics and semantics was first put forward by Charles Morris in his contribution to the *International Encyclopedia of Unified Science*, which included contributions from Rudolf Carnap, Otto Neurath, John Dewey, Leonard Bloomfield, Niels Bohr, Ernest Nagel, Bertrand Russell, and others. Morris contributed a short piece on scientific empiricism—a synthesis of radical empiricism, methodological rationalism, and critical pragmatism—and a long entry titled "Foundations of the Theory of Signs" (1955 [1938]). The basis for Morris's distinction stemmed from his definition of 'semiosis,' a concept which he drew from Charles Peirce and which he defined as "the process in which something functions as a sign" (1955 [1938]:81). The semiotic process consists of three components—the sign vehicle, the designatum (the object designated by the sign), and the interpretant—and is characterized as something (the interpretant) taking account of something (the designatum) by means of a third something (the sign). From the triadic process of semiosis, Morris claimed that it was possible to abstract three dyadic relations concerning the sign vehicle and study these relations as three different domains. These three dyadic relations and their associated domains of study are as follows:

(1) the sign's relation to its objects, i.e. *semantics*
(2) the sign's relation to its interpreters, i.e. *pragmatics*
(3) the sign's relation to other signs, i.e. *syntactics*

For more on Morris's distinction of *pragmatics* from *pragmatism*, see (Morris 1955 [1938]:107-110). For an overview of different ways to characterize the semantic-pragmatic distinction, see (Szabó 2006).

[2] Concerning indexicals, Kaplan (1989) notes that there are two kinds of semantic content: (i) truth-conditional content (or propositional content) and (ii) character. A **character** is a function (set by linguistic conventions) from context to propositional content, while **content** is a function from a circumstance of evaluation (e.g. possible world) to a truth value. On Kaplan's account, indexicals, unbound demonstratives, and pronouns determine content that varies with context, and these expressions have a *constant character* but *variable content*, while non-indexical, non-pronominal, and non-demonstrative expressions determine content that does not vary with context, and so these expressions have *constant character* and *constant content*.

expressions, e.g. indexical expressions like 'I,' 'you,' 'today,' etc. Second, there are **free enrichments**, which are non-linguistically controlled processes that are, in Recanati's language, **"**responsible for making the interpretation of an utterance more specific than its literal interpretation."[3] Examples include cases of *conversational implicature* but also temporal restrictions in the case of 'I ate breakfast' (today rather than ever) or a specification that John jumped *off the cliff* in 'John went to the edge of a cliff and jumped.'

The presence of these two different types of contextual enrichments presents a question concerning the scope of semantics and pragmatics. Does the specification of the *literal meaning* of an *utterance* involve only linguistically-directed contextual enrichment or does it also involve free contextual enrichment? Descendents of ideal-language philosophy or theorists with a foot in formal semantics (or **minimalists**) contend that context plays a limited role in determining literal meaning and so all contextual information is supplied by linguistic rules like those of indexical expressions.[4] Descendents of ordinary-language philosophy or theorists with certain commonsense psychological views on the role linguistic intuitions have on meaning (or **contextualists**) contend that linguistically-directed contextual enrichments are not enough to deliver the literal meaning of a sentence.[5] That is, contextualists argue that determining the literal meaning of an utterance of a sentence often requires *free* contextual enrichment.

One charge routinely made against minimalists is that the literal meaning assigned to utterances by a minimalist theory is not psychologically realistic.[6] This objection is sometimes known as the **inappropriateness objection** (see Borg 2004, 2005) since a commitment to a linguistically-driven account of the semantic role of context delivers truth conditions but ones thought to be inappropriate given wider considerations about human psychology and communication. Such truth conditions are inappropriate because they fail to accord with linguistic intuitions, namely our immediate, pre-reflective, and conscious judgments about what an utterance of a sentence says. For example, minimalists contend that an utterance like 'John is ready' expresses the proposition *John is tall* and is true if and only if *John is tall*. Contextualists object that what when such a sentence is uttered in context (e.g. in the context of sixth-graders), we actually cognize a more enriched proposition, e.g. *John is tall for a sixth-grader* and not just

---

[3] See (Recanati 2004:10, 18).

[4] Minimalists are often characterized as being a descendent of ideal language philosophy and formal approaches to meaning. These include Gottlob Frege, Bertrand Russell, the early Wittgenstein, A. J. Ayer, Rudolf Carnap, and later Richard Montague. Currently, it is championed, implicitly or explicitly, by a variety of figures, including Cappelen and Lepore (2005a, 2005b), Emma Borg (2004, 2007), Jeshion-Nelson (2002), and Jason Stanley (2007). In this section, I characterize what I take to be the core features of semantic minimalism and then point to three instances of the theory (noting their relevant differences).

[5] Contextualists are descendents of ordinary language philosophy, the use theory of meaning, and early developers of speech act theory. Some notable early influences upon contextualists include Wittgenstein (2001), J. L. Austin (1975, 1979), John Searle (1969), Wilfrid Sellars (1974), and others. Currently, it is championed, implicitly or explicitly, by a variety of figures. Contextualists include John Searle (1978, 1979b, 1980), Charles Travis (1985, 1996, 2000), François Recanati (1989, 2001, 2002, 2004, 2010), Anne Bezuidenhout (1996, 1997b, 1997a, 2002; 2002), Sperber and Wilson (1995; 2004), Robyn Carston (1988, 2002, 2008), and others (e.g. Wieland 2010).

[6] There are at least two ways to flesh out the inappropriateness objection. First, as Robyn Carston (1988:158, 2002:177-181, 2008:328n) and François Recanati (2001:88) and others have done insist that the minimalist's notion of literal meaning plays a superfluous role in a broader story about communication. First, an opponent to minimalism might argue that the minimal proposition plays *no functional role* in communication. Second, according to Recanati and others (1989, 1993:246-250, 2004:13-16; see also Carston 2002:166-170; Bach and Harnish 1979:29), the literal meaning of an utterance must be 'available' insofar as it is accessible to our ordinary, pre-reflective intuitions about what is literally expressed.

John is tall simpliciter.[7] And so, if semantic facts depend upon psychological facts, and if the psychological reality of the literal meaning of an utterance depends on according with linguistic intuitions about what an utterance says, then minimal truth conditions float free from psychological reality.

In what follows, I argue that the literal meaning posited by minimalists does fit into a wider discussion concerning human psychology by being the content generated by a unique 'modular' language faculty. While this content is not 'intuitive' or the content that language users consciously judge themselves to have said, such content is immune from the broader complaint that literal meaning is an idle wheel in a larger explanation of psycholinguistic processing and communication. Following Emma Borg (2004) I argue that minimalism better accords with how literal meaning gets cognized since it (and not contextualism) is consistent with a *modular approach to language processing*. In addition, I respond to one recent criticism by Philip Robbins (2007) of this view that claims that the clinical evidence commonly used to support modular language processing is not convincing. This argument occurs in three steps. First, I very briefly articulate what it means for a cognitive system to be modular. Second, I argue that a modular linguistic processing supports the minimalist theory and not the contextualist position. Third, I argue that the linguistic processing of literal meaning is modular by appealing to clinical evidence from Williams Syndrome.

2. What is a Module

The notion of a module is both central to and contested within computational approaches to cognitive science and psycholinguistic analysis.[8] In coarse terms, to say that the cognitive architecture of a human being is **modular** is to say that the computations that go in to producing a mental representation arises from a collection of multiple, differentiated, bottom-up processes instead of a set highly collaborative processes that involve top-down intrusion. As such, the modular point of view is closely tied to the nativist position that treats the mind, not as a general-purpose learning device, but as consisting of a number of innate, content-rich, domain-specific structures. Beyond this rather rough characterization, the notion of a module is contested since philosophers argue over which features are essential to modular cognitive processes. For this essay, I understand a **module** as a diachronic, informationally-encapsulated, domain specific, and functionally dissociable cognitive system that need not be anatomically localizable.[9] To say

[7] Another example is the utterance 'You are not going to die,' said to a child who has just cut his finger. According to the minimalist, the literal meaning of this utterance is: *You are immortal*. A contextualist might argue that this conflicts with our commonsense understanding of what is literally said, namely, *You are not going to die from that cut*.

[8] David Marr (1982:102, see also 325) writes that "the idea that a large computation can be split up and implemented as a collection of parts that are as nearly independent of one another as the overall task allows, is so important that I was moved to elevate it to a principle, the *principle of modular design*."

[9] For purposes of space, I don't define these terms in text. Briefly, a cognitive process is **informationally-encapsulated** if and only if the operations of the system cannot draw upon information outside of that system. For example, a visual system is encapsulated if whenever operating upon visual input, it does not draw on linguistic or auditory information to determine its output. A cognitive process is **domain specific** if and only if here is a restriction on the types of information it can take as input. So, for example, we would say that a visual system is 'domain specific' if it can only take information supplied by the rods and cones of the retina as input.
A cognitive process is **functionally dissociable** from another cognitive system if and only if it can perform its operations relatively independent from the function of the other system. Thus, functionally dissociable systems tend to be susceptible to *selective impairment*, i.e. they can be impaired, damaged, or removed, with minimal effect on

that the literal meaning of an utterance is performed by a modular language faculty is to say that our cognitive infrastructure takes a specific type of input (syntactic items) and uses a mental lexicon to assign truth conditions to these items in a way that is maximally insensitive to contextual ingredients. [10]

3. Three Reasons Why Semantic Processing is Modular

Given the above definition of a cognitive module, there are three reasons why our comprehension of the literal semantic content is something that might warrant some degree of modular explanation and two reasons why minimalism (but not contextualism) is compatible with this approach to language processing.

First, semantic comprehension is *domain specific* in that it is limited to a narrow set of phenomena, namely orthographic and phonetic input (not buzz saws, explosions, and animal sounds) that is syntactically structured. Second, semantic comprehension is *informationally encapsulated* in that we are able to interpret the meaning of sentences independently of our expectations about the world. That is, we can understand what someone says even if what they say has no relevance to the situation or if we have little to no knowledge about the *contextual factors* that surround their utterance. Third, semantic comprehension is *functionally dissociable* insofar as the different linguistic abilities and competencies of language users seem to be susceptible to selective patterns of breakdown and preservation. For example, brain damage to a language user might manifest certain deficiencies in being able to pick up on *what speakers mean* but no loss in knowledge of the *literal meaning* or *grammatical rules* governing utterances (as well as the converse pattern).

Minimalism appears to fit well with these psychological facts. First, a modular account of linguistic processing that is informationally-encapsulated is a *bottom-up process*, namely higher levels of linguistic meaning are built up from lower levels without interference from the higher levels. For example, a bottom-up account of linguistic processing would contend that recognizing a sound as a *phoneme* is determined independently of the belief that a language user is being sarcastic when uttering a sentence. In other words, beliefs about a language user's intentions do not interfere with determining whether a given sound is a phoneme. In a similar way, minimalists, in claiming that the determination of the literal meaning is maximally insensitive to contextual factors that are not triggered by syntactic or lexical features in the

---

other systems. Examples include: achromatopsia (color blindness), prosopagnosia (inability to recognize faces), and various forms of dyslexia (reading impairment).

[10] Many linguistics, evolutionary psychologists, and philosophers think there is something special about human language, and distinguish aspects specific to a language faculty from those shared with other psychological abilities. In detailing why the language faculty is special, they tend to explain it as though it were a module or a uniquely functioning organ. Chomsky (1980:39), for example, writes, that "We may usefully think of the language faculty, the number faculty, and others, as 'mental organs,' analogous to the heart or the visual system or the system of motor coordination and planning." In other words, just as the visual system is modular, so is language. Chomsky (1980:39) continues "In short, there seems little reason to insist that the brain is unique in the biological world in that it is unstructured and undifferentiated, developing on the basis of uniform principles of growth or learning—say those of some learning theory, or of some yet-to-be conceived general multipurpose strategy—that are common to all domains." Chomsky (1975) states this position elsewhere when he writes "To come to know a human language would be an extraordinary intellectual achievement for a creature not specifically designed to accomplish this task. A normal child acquires this knowledge on relatively slight exposure and without specific training. He can then quite effortlessly make use of an intricate structure of specific rules and guiding principles to convey his thoughts and feelings to others, arousing in them novel ideas and subtle perceptions and judgments."

sentence, is consistent with a bottom-up approach to the generation of the literal meaning where processes like free enrichment *do not* interfere with how meaning gets processed.

Secondly, and more important for this paper, minimalism is entirely compatible with syntactic-semantic processes being *functionally dissociable* from pragmatic processes, and is also consistent with the psychological reality of selective impairment. For if the processing of the literal meaning is a bottom-up process, knocking out certain pragmatic abilities in speakers will yield an inability to understand *what a speaker means* but not a failure to understand the *literal meaning* of the utterance. In short, minimalism is entirely consistent with there being a functional dissociability between semantic and pragmatic capacities since it makes the literal meaning of a sentence maximally insensitive to free contextual enrichment.

In contrast, contextualism does not seem to accord with a modular explanation of language processing. First, contextualism does not sit well with literal meaning being generated by an informationally-encapsulated process since free enrichment is a top-down process that involves the contextual enrichment of a sentence by supplying some missing (unarticulated) constituent by drawing upon the context in accordance with conversational principles. If this is the case, then the manner in which we process the literal meaning of an utterance is a global (unencapsulated) process that relies just as much upon our pragmatic ability to pull from our knowledge of context as it does upon our syntactic-semantic abilities.[11]

The second reason that contextualism is inconsistent with a modular explanation of how literal meaning is processed is that contextualism is not consistent with the *functional dissociability* of syntactic-semantic processing from pragmatic processing. To say that the generation of literal meaning requires free contextual enrichment is to say that certain purely pragmatic abilities are necessary to producing the literal interpretation of an utterance. If this is the case, then we should not see evidence of selective-impairment of cognitive functions responsible for determining literal meaning. That is, we shouldn't see cases where language users are able to determine the literal meaning but not capable of working out speaker meaning (as well as converse cases).

In short, there are at least three reasons to think that the psychological reality of literal meaning can be explained by a modular approach and there are two reasons why modular account accords with minimalism (but not a contextualism). Minimalism can thus offer a response to the general charge of contextualists that it fails to be psychologically realistic by arguing that the literal, truth-conditional content of utterance by claiming that literal meaning is generated by a bottom-up modular process where language users interpret the syntactic features of the sentence. This mental machinery is consistent with the minimalist's claim that there exists some minimal semantic content that is the result of a computational or decoding procedure over sentence-types relative to context (domain specific), these computations are independent of constituents that are found in the context but not articulated in the utterance (encapsulation), and

[11] It might, however, be argued that the cognitive processes involved in minimalism involve top-down processes since our *expectations* about what a speaker is going to say plays a role in our cognition of what they do say. This is not problematic with minimalism since minimalism allows for the presence of a number of top-down processes in pre-semantic tasks (e.g. identifying a certain syntactic structure) as well as pragmatic processes playing a *facilitative role* (e.g. pragmatic processes may play a role in our *expectations* about what a speaker says but are certainly not determinative of what they do say). What minimalists reject is the presence of top-down processes in the determination of literal meaning for the process of determining the literal meaning of an utterance is a bottom-up process that is protected from the interference of the pragmatic level.

this process is dissociable from other types of propositions generated by pragmatic interpretation, e.g. generation of implicatures or more contextually-enriched propositions.[12]

4. Selective Impairments and Functional Dissociability

The most empirically tractable of these two reasons noted above is *functional dissociability* since its existence appears to be confirmed/denied by whether certain psycholinguistic abilities are subject to *selective impairment*. The idea is that if we can simply knock out one part of the linguistic system and find that it does not interfere with the performance of another system (as well as the converse pattern), we would have strong evidence for modularity. Given a modular view of language understanding that posits one syntactic-semantic module that determines literal meaning and another pragmatic module that determines speaker meaning, there are thus four possible distributions of selective impairment/preservation.[13]

	Syntax-Semantics	**Pragmatics**	**Result**
A	**X**	**X**	Complete impairment of linguistic and non-linguistic abilities.
B	**X**	**0**	Stroke victims; aphasics (Broca's aphasia)
C	**0**	**X**	Asperger's patients, certain schizophrenics, Williams Syndrome patients
D	**0**	**0**	Normal processing

Figure 1: Adapted and modified from (Borg 2004:100). Predicted outcomes as a result of the loss/preservation of syntactic-semantic and pragmatic abilities. **X** = Impairment; **0** = Normal function

If the processing of literal meaning is subject to selective impairment, then we should see two outcomes. First, syntactic and semantic skills should be capable of remaining relatively intact while there is significant pragmatic impairment. Second, there should be a case where pragmatic skills remain intact while syntactic and semantic skills suffer deficit. Emma Borg (2004:100) claims that empirical evidence suggests that there are such scenarios. In the former case, victims of stroke and various aphasic patients retain general, non-linguistic abilities but have severe impairments when it comes to processing and producing meaningful linguistic utterances. In the latter case, patients with Asperger syndrome, some schizophrenics, and individuals with Williams Syndrome manifest the converse pattern, i.e. they retain syntactic-semantic abilities but suffer from significant impairments when it comes to non-linguistic skills that play a role in determining literal meaning. In focusing just on the latter of these two breakdowns, [14] we need to

[12] It might be objected here that contextualism is consistent with a modular explanation since *some* contextualists think meaning is processed by a bottom-up (modular) approach but that this does not yield *truth-conditional content* (or a real proposition). Instead, these contextualists argue that modularity only yields a *propositional radical* or truth-conditional content that falls short of expressing genuine truth conditions. It is important to point out that my argument is partly defensive and partly offensive. On the one hand, I am responding to contextualists who object that minimalism is not *psychologically realistic*. These contextualists tend to think that the generation of literal meaning is a top-down (pragmatic) process. Against these contextualists, I am also offering an offensive argument that their contextualism is incompatible with a modular explanation.

[13] Here I do not take a stand on another issue in neurolinguistics concerning whether the human brain is modularized from the outset (innate) or whether the specific functions are the result of environmental input and development. For more on this issue with respect to individuals with Williams Syndrome, see (Stojanovik, Perkins, and Howard 2004).

[14] It has been argued (Martínez-Manrique and Vicente 2009) that evidence supporting (B) is limited to production aphasiacs, but there is evidence from the limited ability of Broca aphasiacs differential ability to cognize Arabic numbers that stands against this. However Delazer et al. (Delazer et al. 1999:218-219) argues that Broca's aphasiacs

see whether there is (i) a *genetic disorder* or *brain damage* that either inhibits free contextual enrichment but preserves the processing of literal, semantic content or (ii) a *neurodevelopmental pattern* that reflects general competency in processing literal meaning but deficiency in free contextual enrichment. If there is such a disorder or pattern, then this would suggest the existence of a functional dissociability and so would support the claim for modularity.

The most prominent defense of this position is provided by Emma Borg (2004:100-106) who points to Asperger patients, individuals with schizophrenia, and Williams syndrome (WS) patients as evidence for a language module. However, Philip Robbins (2007:306-307) has argued that empirical data does not support the claim that semantic interpretation (i) is an informationally encapsulated process or (ii) is functionally dissociable (2007:306-307).[15] Robbins (2007:309-311) argues that while minimalists cite cases where individuals have normal semantic ability but deficits in 'mind-reading' (or pragmatic abilities), such cases are overly brief and sketchy (cf. Baron-Cohen 1997; see Borg 2004:99-106; Robbins 2007:309-311).[16] In particular, Robbins (2007:309-310) argues that while individuals with Asperger syndrome (AS) have relatively spared semantic abilities but impaired pragmatics skills—e.g. they have difficulties with irony, sarcasm, slang, metaphor, and other forms of figurative speech—this is "not enough to show that semantics is functionally dissociable *in the relevant sense*." Robbins cites a variety of reasons why individuals with AS do not manifest the relevant type of functional dissociability; two of these include studies where WS individuals perform like normals on standard mindreading tests and even though they fail at advanced mindreading tasks like the faux pas detection test and 'strange stories' tests. From this evidence, Robbins (2007:310) concludes that "individuals with AS have enough of an ability to discern speakers' intentions to understand literal speech, but not enough of this ability to understand irony, sarcasm, conversational faux pas, and the like." In addition to individuals with AS, Robbins points to the fact that clinical evidence for Williams Syndrome (WS) does not support the claim of functional dissociability and so fails to support the minimalist's position on modularity. Here, Robbins cites cases that claim that individuals with WS have little difficulty understanding sarcasm and metaphor (Karmiloff-Smith et al. 1995) and are apt readers of a person's mental states off of their facial features (Tager-Flusberg and Sullivan 2000).

Robbins' conclusion then is that the major discussion of the clinical literature by Borg (2004) focused more on breadth rather than depth and, in the end, is not supported by clinical data. It should be pretty evident that determining whether a bit of clinical evidence is evidence for selective impairment and hence dissociability is not a straightforward matter. First, there are empirical difficulties since isolating specific pragmatic breakdowns requires a qualitative assessment that faces serious problems with respect empirical verification (Bishop 1998:880). Second, there has emerged some recent clinical data that slightly undermines some of the claims Robbins (2007) cites in support of the purported pragmatic abilities of WS to read mental states off of faces. For example, (Riby and Back 2010) show that while WS individuals performed similar to typically developing individuals at determining mental states from dynamic presentations of whole face expressions, WS individuals showed significant deficiencies when

"showed a format effect and scored significantly lower in reading Arabic numerals than in reading number words (none of the other groups presented with this effect). This result indicates that Broca's difficulties in reading Arabic numerals cannot be simply explained by speech output problems, but more likely by specific difficulties in assembling the syntactic structure of complex numerals."

[15] Concerning information encapsulation, Robbins (2007:309) claims that empirical evidence does not decide the matter one way or the other.

[16]

the eyes of the face were kept frozen. Third, Robbins assumes that evidence for functionally dissociability only occurs if there is a loss of some *basic* pragmatic ability, not when there is the loss of some advanced pragmatic skill. One issue with this is that there is a scaling and vagueness problem for we are not given a justification for (or listing of) what qualifies as a high-level pragmatic ability vs. a low-level pragmatic ability. Robbins contends that evidence showing that have difficulties understanding irony, sarcasm, slang, metaphor, and conversational faux pas can be disregarded since this counts as an advanced pragmatic ability. If understanding these kinds of language are disqualified, then what does qualify?

In the next section, I don't offer solutions to many of the questions I raise above. Instead, I argue that a closer examination of the literature on Williams syndrome (WS) suggests a selective impairment of literal linguistic processes and context-rich processes and this suggests a functional dissociation that favors a modular explanation.

5. Williams Syndrome

Williams syndrome (WS) is a rare neurodevelopmental disorder that is caused by the deletion of approximately 28 genes of chromosome 7 (Schubert 2008). Individuals with WS are probably best known for their hypersociality (Jones et al. 2000), their love of music, and a distinctive pattern of facial and physical characteristics (Pober and Dykens 1996; Mervis 2003; Mervis and Becerra 2007).[17] The disorder was first described in 1961 and has been the subject of much discussion by cognitive scientists, linguists, and philosophers.[18] Although philosophers have claimed that WS patients are severely mentally incapacitated and suffer from a high degree of impairment across a wide range of abilities (e.g. Borg 2004:104; Prinz 2006), empirical research classifies WS patients as having a number of mild to moderate intellectual disabilities with a range of other deficits.[19]

The major turning point in research on WS came in the form of a published chapter by Bellugi et al. (1988). While early research on WS noted that the language abilities of individuals with WS were below their chronological age counterparts (Kataria, Goldstein, and Kushnick 1984; Meyerson and Frank 1987), Belugi et al. (1988) argued for the provocative claim that while individuals with WS were mentally impaired, their language abilities were excellent. In particular, while visuospatial construction was severely compromised, it was claimed that WS individuals were able to perform complex syntactic operations and had excellent vocabularies. This claim was quite startling since the divided cognitive profile of WS individuals provided evidence for the independence of language from cognition, i.e. a functioning language processing system that operates independently of other cognitive skills (see Bellugi et al. 2000). The result of this work led to some strong claims concerning the *independence* of language from the rest of cognition.[20] However, subsequent clinical data revealed that the presence of a strong

[17] For example, connective tissue abnormalities, cardiovascular disease, facial dysmorphology, decreased muscle tone, etc. (Martens, Wilson, and Reutens 2008; Bellugi, Klima, and Wang 1996; Pober and Dykens 1996).

[18] (Williams, Barratt-Boyes, and Lowe 1961; see also Beuren 1972; Jones and Smith 1975; Bennett, LaVeck, and Sells 1978; Kataria, Goldstein, and Kushnick 1984)

[19] The IQ of WS patients ranges from 40–100, with an average lying between 50 and 60 (see Martens, Wilson, and Reutens 2008:577). This average places WS patients in the category of individuals with mild to moderate mental retardation.

[20] Two examples. First, "Williams Syndrome individuals almost invariably show mild to moderate retardation; they uniformly require special educational placements as children, and for the most part acquire only rudimentary skills in reading, writing, and arithmetic. Particularly sever deficits show up in tests of spatial understanding such as copying patterns of blocks. Their language, though, is if anything more fluent and advanced than that of their ages-

dissociation of the language faculty and other cognitive systems were overstated. Despite early claims concerning the independence of language from the rest of cognition, recent research has identified a number of syntactic deficits in WS patients. This has led many researchers to abandon a modular account of language processing altogether or to aggressively attack it as a scientific myth (Stojanovik, Perkins, and Howard 2004; Stojanovik 2006; Karmiloff-Smith et al. 2003; Karmiloff-Smith 2007; Mervis and Becerra 2007; Mervis 2003).[21]

Despite the fact that there is not a clean break between language cognition and other forms of non-linguistic cognition, there exists a cognitive *asymmetry* among the different language abilities of WS patients. And, while this is not ideal evidence for the presence of an innate, biologically hard-wired language module that becomes active independently of environmental stimulus or biological maturation, the uneven cognitive profile of WS individuals strongly suggests a functional dissociation between different language abilities. First, individuals with WS show a relative strengths in auditory processing (Mervis et al. 2000:622), the use of emotional prosody (Jones et al. 2000), phonological short-term memory, and perform well on tests that require naming, receptive vocabulary, and semantic fluency (Temple, Almazan, and Sherwood 2002; Mervis et al. 2000). With respect to grammar and syntax, while WS individuals manifest certain subtle difficulties with their understanding of grammatically complex sentences and their use of personal pronouns, they outperform individuals with Down's Syndrome and there is relative consistency between their vocabulary development and grammatical understanding for their mental age (see Brock 2007). Finally, and important here, is that despite relative strengths in syntax and semantic abilities, WS patients suffer from significant pragmatic impairments relative to those of a similar mental age (Laws and Bishop 2004), show relative strength in language-related abilities than other non-language-related abilities (Harris et al. 1997), and have more difficulty understanding language the more it relies upon contextual knowledge. In particular, Sullivan et al. (2003:97) claim that WS patients "have particular difficulty grasping the underlying connection between mental states and non-literal language."[22]

Thus, while there is not a clean break between the syntactic-semantic abilities and the pragmatic abilities of individuals with WS, clinical data supports the existence of an *asymmetrical cognitive profile* in WS individuals with relative strengths in syntactic-semantic tasks and weaknesses in pragmatic tasks. While the evidence is less than ideal, the uneven cognitive profile of WS individuals is evidence for a kind of selective impairment, which is in turn supports the case for a modular (or quasi-modular) language faculty. With this in mind, recall the claim from Robbins that real evidence for selective impairment would involve cases

---

mates; in fact, they tend to be so talkative and expressive that to the unwary observer they may not appear retarded at all (at least at first)." (Jackendoff 1994:116-117; see also Jackendoff 2002). Second, "[T]he genetic double dissociation is striking, suggesting that language is both a specialization of the brain and that it depends on generative rules that are visible in the ability to compute regular forms. The genes of one group of children [with specific language impairment] impair their grammar while sparing their intelligence; the genes of another group of children [with WS] impair their intelligence while sparing their grammar." (Pinker 1999:262).

[21] Part of the reason for this skepticism is that subsequent research seems to show that WS patients suffer from syntactic impairments. However, many of these studies are problematic because they do not show that the impaired syntactic ability is not the result of an overall impairment in mental function or IQ. For while all agree that the language abilities of WS patients is not comparable to normal language users (compared in terms of chronological age), showing that WS patients do not retain an intact syntactic-semantic module requires evidence that compares these abilities to their verbal or non-verbal mental age. For while there may be certain syntactic and semantic deficits in WS patients, none of that shows that the syntactic-semantic performance is impaired in comparison to their non-linguistic (pragmatic) abilities.

[22] For an alternate conclusion, see (Karmiloff-Smith et al. 1995) and (Sullivan, Winner, and Tager-Flusberg 2003:98) for a discussion of this essay.

where the processing of the literal meaning of an utterance runs relatively smoothly but there are deficiencies in some *basic* pragmatic abilities. In response to Robbins, the minimalist can contend that individuals capable of producing truth-conditional interpretations of utterances will have some, very basic pragmatic abilities but these abilities will be *linguistically-directed* and not the result of *free enrichment*. Thus, the resolution of semantic values for indexical expressions, tensed expressed, and overt contextuals require pragmatic skills, although these skills are driven by linguistic triggers (Cappelen and Lepore 2005a). So, what counts as relevant evidence for the functional dissociability of syntactic-semantic skills from pragmatic skills is a dissociation of *free contextual enrichment* (e.g. temporal restriction, conversational implicatures, perhaps metaphor) from enrichments are more-or-less *linguistically driven* (e.g. the resolution of pronouns, comparatives, syntactic ellipsis).

The clinical evidence supports this type of breakdown in individuals with WS for consider that the ability to distinguish between various forms of literal falsehoods (e.g. mistakes, metaphor, irony, lying, sarcasm), which depends upon the ability to interpret a linguistic expression in relation to the mental states of speakers, i.e. to engage in 'mind-reading.' **Mind-reading** is the pragmatic ability where individuals use various features of the context in which an utterance is made to make inferences about the intentions or mental states of the speaker of the utterance.[23] Beliefs about intentions are then used to make determinations about the speech act content of an utterance, e.g. if the speaker is lying, saying, asserting, claiming, etc. Since these beliefs about a language user's mental state are not coded in any of the orthographic or phonetic features of the sentence relative to an individual's knowledge of grammar or semantic knowledge, the use of a speaker's intentions to interpret a sentence is a process of free contextual enrichment.

One such example where this type of pragmatic ability comes to bear is the ability to distinguish between a *lie* and a *joke*. Identifying an utterance as a lie or as a joke requires a type of second-order knowledge of mental states. In order to adequately determine that a falsehood is a *joke*, the listener must know something that the speaker knows so they can draw the inference that their utterance is both not *merely false* and *not a lie*. For example, suppose you and I are at the zoo and you see me staring at a large hippopotamus. Pointing at the hippo, I say to you 'that hippo is little,' thinking that you will reason—from the outrageousness of the claim as well as my tone of voice—that the utterance should be interpreted as sarcastic or a joke. However, for you to know that I'm joking rather than lying, you need to know that I believe that the hippo is *not* little, and further, you need to know that I know that you know this about my mental state. You might, however, be oblivious to the context, interpret the literal meaning of the utterance, see that the proposition it expresses is *false* and then conclude that I am lying rather than joking.

In normal developing children, the ability to distinguish between various forms of literal and non-literal language occurs between the ages of 5 and 8 (Winner et al. 1987). In contrast, to normal developing individuals, Sullivan et al. (2003) have shown that WS patients have difficulty distinguishing between lies and jokes. In particular, they tend to misclassify jokes as lies. What explains this phenomenon is that WS patients evaluate the meaning of false utterances *relative to reality* and *not relative to the second-order knowledge about the speaker*. Utterances are thus assessed independently of the intentions of the speaker, which is evidence for a pragmatic deficiency.

[23] For example, if I say 'John is a really nice guy,' in a sarcastic tone, you are likely to interpret the linguistic item in relation to my tone, and infer that I don't mean John is a really nice guy.

A second example comes from deficits WS patients have in distinguishing different forms of non-literal language. Studies show that WS patients (in comparison to typically developing individuals) have increased difficulty comprehending the meaning of utterances the *more figurative* the language is. For example, Annaz et al. (2009) show that not only do WS patients perform worse than their developing counterparts on comprehending metaphors and metonyms, but they performed worse than expected on metaphors in comparison to their performance on metonyms.[24] Thus, if metaphors are more pragmatically demanding than metonyms, and WS patients have deficits in understanding this more pragmatically demanding form of non-literal language, then WS patients ought to show a selective impairment for understanding sentences requiring increase pragmatic skills. However, as noted earlier, this evidence might not be convincing to the minimalist's opponent for as Robbins claims, real evidence for selective impairment would involve cases where the processing of the *literal meaning* of an utterance runs relatively smoothly but there are deficiencies in some basic pragmatic abilities and not advanced ones like understanding metaphor. However, the minimalist can argue that what matters here is not that metaphors are more pragmatically demanding than metonyms, but that WS individuals are capable of better understanding metonyms because they behave in a more rule-governed and relatively formulaic way.[25] In other words, the relative strength of WS in certain non-pragmatic linguistic tasks can be thought to carry over, mask, or even influence the processing of basic pragmatic abilities. Whereas conceptual metaphors are systematic mappings of the structure of one conceptual domain (the target domain) onto another conceptual domain (the source domain), metonyms are systematic substitutions of one thing (the vehicle entity) for another thing (target entity) within a single conceptual domain. What makes metonymic substitutions less pragmatically demanding but also rule-governed is that substitutions are between entities that are conceptually "close" or conceptually *contiguous* with each other. The type of contextual enrichment involved in metonymic interpretation is restricted by a form of material, causal, or proximal relation.[26] In order to understand a metonym, language users do not need knowledge about an entirely different conceptual domain.[27] In contrast,

[24] More generally, Martens, Wilson, and Reutens (2008:586) write "Overall, the findings suggest that individuals with WS display typical (but delayed) skills in the following areas of language development: complex syntax, semantics, world fluency, expressive vocabulary, plurals, irregular past tense, and mean length utterance. Language development appears to be atypical in the following domains: grammatical comprehension, gender agreement, morphosyntax, pragmatics, oral fluency, and reciprocal conversation." Notice that these results partially suggest the existence of a modular cognitive processor for syntactic-semantic processing. Pragmatics, oral fluency, and reciprocal conversation are all highly context-sensitive aspects of communication and atypical in the language development of WS patients.

[25] Part of this argument may also depend upon a particular sense of metaphor, i.e. whether it deserves a semantic (Stern 1985), pragmatic (broadly Gricean) (Searle 1979a), or Davidsonian treatment (Davidson 1978).

[26] See (Preminger and Brogan 1993). This is not the only way to understand metonomy; for a detailed discussion, see (Papafragou 1996). What is important for the argument in this paper is that metaphor requires more cognitive, pragmatic resources than metaphor. Examples of metonyms include the following: cases where the author of a work is substituted for the work itself ('I'm reading *Hemmingway*'), where part of the object is substituted for the whole object ('There is a new face in the office'), where a location is substituted for people or the institution occupying that location ('Washington said no to universal health care'), and where the date/place where something happened is substituted for an event ('9/11 is a day that changed America'). Thus, in the case of 'I'm reading *Hemingway*', *the work* is conceptually contiguous with the *author of the work* since the author wrote it.

[27] According to Kövecses (2002:148) "the main function of metonymy seems to be to provide *mental*, *cognitive access* to a target entity that is less readily or easily available; typically, a more concrete or salient vehicle entity is used to give or gain access to a more abstract or less salient target entity within the same domain." This is only partially correct since while metonymy does provide cognitive access to a target entity that is less readily available, but it is not the case that the vehicle entity is more concrete. Take the example, 'Washington said no to universal

metaphors are highly pragmatically demanding because (i) they require knowledge of at least two different conceptual domains and (ii) metaphors does not involve the same type of conceptual restriction that metonyms do for they are restricted by an intimate, direct, physical, contiguity within a conceptual domain but rely instead upon resemblances or structural similarities between concepts (see Papafragou 1996:172). To see the difference, consider two examples:

(1) There is a new face in the office.
(2) The face of the clock reads nine.

In the case of the metonym in (1), 'face' is a part-whole metonym for 'person'. In the case of the metaphor in (2), the use of 'face' requires language users to map the conceptual domain of *human faces* to various *features of a clock*. Understanding the non-literal meaning of (1) is less pragmatically demanding than (2) since the interpretation of (1) both (i) does not require language users to know a lot about other conceptual domains (e.g. about human physical features) and (ii) the interpretation of (1) is guided by various metonymic substitution rules, e.g. you can substitute part of an object for the whole. So, there appears to be empirical evidence from WS patients that supports the idea that there is an independent syntactic-semantic module that operating autonomously from pragmatic processes.

6. CONCLUSION

Against the view that minimalism is not psychologically realistic (Recanati 2004), I argued that minimalism (but not contextualism) accords with a modular account of linguistic understanding. To support the claim, I cited clinical evidence from individuals with Williams Syndrome, whose uneven cognitive profile provides evidence for syntactic-semantic abilities being functionally dissociable from pragmatic abilities. Against (Robbins 2007), who argues that the minimalist's appeal to functional dissociability is not supported by the right sort of clinical facts, I argued that the modularity hypothesis is consistent with minimalism and the preservation of some limited, mostly rule-driven pragmatic capacities but not with pragmatic abilities that are often associated with free enrichment. Thus, while more research needs to be performed on how individuals with WS process free contextual enrichments in comparison to linguistically-driven contextual enrichments (e.g. temporal restrictions), the clinical data at least suggests that the semantic facts posited by minimalists are not lacking in a psychological correlate.[28]

References

Annaz, Dagmara, Jo Van Herwegen, Michael Thomas, Roza Fishman, Annette Karmiloff-Smith, and Gabriella Rundblad. 2009. Comprehension of metaphor and metonymy in children

health care.' In this case, 'Washington' is the vehicle entity and 'government officials A, B, C, etc,' is the target entity. The target entity is actually *more concrete* but *less cognitively accessible* (i.e. more cognitively and linguistically demanding to articulate).

[28] The psychological facts upon which semantic theory depends are just *not* readily apparent or available to normal language users who are more concerned and geared toward what speakers are trying to communicate. Minimal propositions turn out to be psychologically realistic and play a role in a broader story about human cognition and communication but their role is *tacit* rather than *explicit* since they are grasped by their users *en route* to determining speaker meaning.

with Williams syndrome. *International Journal of Language & Communication Disorders* 44(6):962-978.
Austin, J.L. 1975. *How to Do Things With Words*. Edited by J.O. Umson and Marina Sbisà. 2nd ed. Cambridge, MA: Harvard University Press.
———. 1979. Performative Utterances. In *Philosophical Papers*, edited by J. O. Urmson and G. J. Warnock. Oxford: Oxford University Press, pp.233-252.
Bach, Kent, and R. M. Harnish. 1979. *Linguistic Communication and Speech Acts*. Cambridge, MA: MIT Press.
Baron-Cohen, Simon. 1997. *Mindblindness: An Essay on Autism and Theory of Mind*. Cambridge, MA: MIT Press.
Bellugi, U., E.S. Klima, and P.P. Wang. 1996. Cognitive and neural development: Clues from genetically based syndromes. In *The lifespan development of individuals: Behavioral, neurobiological and psychosocial perspectives*, edited by D. Magnussen. New York: Cambridge University Press, pp.223-243.
Bellugi, U., S. Marks, Bihrle A., and H. Sabo. 1988. Dissociation between language and cognitive functions in Williams syndrome. In *Language development in exceptional circumstances*, edited by Dorothy Bishop and Kay Mogford. Edinburgh: Churchill Livingstone, pp.177-189.
Bellugi, Ursula, Liz Lichtenberger, Wendy Jones, Zona Lai, and Marie St. George. 2000. The Neurocognitive Profile of Williams Syndrome: A Complex Pattern of Strengths and Weaknesses. *Journal of Cognitive Neuroscience* 12, Supplement:7-29.
Bennett, F.C., B. LaVeck, and C.T. Sells. 1978. The Williams elfin facies syndrome: The psychological profile as an aid in syndrome identification. *Pediatrics* 61(2):303-306.
Beuren, A.J. 1972. Supravalvular aortic senosis: a complex syndrome with and without mental retardation. *Birth Defects: Original Article Series* 8(5):45-56.
Bezuidenhout, Anne. 1996. Pragmatics and Singular Reference. *Mind and Language* 11:133-159.
———. 1997a. The Communication of De Re Thoughts. *Nous* 31(2):197-225.
———. 1997b. Pragmatics, Semantic Underdetermination and the Referential/Attributive Distinction. *Mind* 106(423):375-409.
———. 2002. Truth-Conditional Pragmatics. *Philosophical Perspectives* 16:105-134.
Bezuidenhout, Anne, and J. Cooper Cutting. 2002. Literal meaning, minimal propositions, and pragmatic processing. *Journal of Pragmatics* 34:433-456.
Bishop, Dorothy V.M. 1998. Development of the Children's Communication Checklist (CCC): A Method for Assessing Qualitative Aspects of Communicative Impairment in Children. *Journal of Child Psychology and Psychiatry* 39(6):879-891.
Borg, Emma. 2004. *Minimal Semantics*. Oxford: Oxford University Press.
———. 2005. Saying What You Mean: Unarticulated Constituents and Communication. In *Ellipsis and Nonsentential Speech*, edited by Reinaldo Elugardo and Robert J. Stainton. New York: Springer, pp.237-262.
———. 2007. Minimalism versus Contextualism in Semantics. In *Context-Sensitivity and Semantic Minimalism: New Essays on Semantics and Pragmatics*, edited by Gerhard Preyer and Georg Peter. Oxford: Oxford University Press, pp.339-359.
Cappelen, Herman, and Ernie Lepore. 2005a. *Insensitive Semantics: A Defense of Semantic Minimalism and Speech Act Pluralism*. Oxford: Blackwell.

———. 2005b. Radical and Moderate Pragmatics: Does Meaning Determine Truth Conditions. In *Semantics versus Pragmatics*, edited by Zoltán Gendler Szabó. Oxford: Clarendon Press, pp.45-71.
Carston, Robyn. 1988. Implicature, Explicature, and Truth-Theoretic Semantics. In *Mental Representations: The Interface between Language and Reality*, edited by R. Kempson. Cambridge: Cambridge University Press, pp.155-181.
———. 2002. *Thoughts and Utterances: The Pragmatics of Explicit Communication*. Malden, MA: Blackwell Publishing.
———. 2008. Linguistic communication and the semantics/pragmatics distinction. *Synthese* 165:321-345.
Chomsky, Noam. 1975. *Reflections on Language*. New York: Pantheon Books.
———. 1980. *Rules and Representations*. New York: Columbia University Press.
Davidson, Donald. 1978. What Metaphors Mean. *Critical Inquiry* 5:31-47.
Delazer, Margarete, Luisa Girelli, Carlo Semenza, and Gianfranco Denes. 1999. Numerical skills and aphasia. *Jounral of the International Neurophysical Society* 5:213-221.
Griffiths, Patrick. 2006. *An Introduction to English Semantics and Pragmatics*. Edinburgh: Edinburgh University Press.
Harris, Naomi G. Singer , Ursula Bellugi, Elizabeth Bates, Wendy Jones, and Michael Rossen. 1997. Contrasting profiles of language development in children with williams and down syndromes. *Developmental Neuropsychology* 13(3):345-370.
Jackendoff, Ray S. 1994. *Patterns in the mind: language and human nature*. New York: Basic Books.
———. 2002. *Foundations of language: brain, meaning, grammar, evolution*. Oxford: Oxford University Press.
Jeshion-Nelson, Michael Don. 2002. *Using Words: Pragmatic Implicatures and Semantic Contents*. Princeton University.
Jones, Kenneth L., and David Smith. 1975. The Williams elfin facies syndrome: A new perspective. *The Journal of Pediatrics* 86(5):718-723.
Jones, Wendy, Ursula Bellugi, Zona Lai, Michael Chiles, Judy Reilly, Alan Lincoln, and Ralph Adolphs. 2000. Hypersociability in Williams Syndrome. *Journal of Cognitive Neuroscience* 12(1):30-46.
Kaplan, David. 1989. Demonstratives: An Essay on the Semantics, Logic, Metaphysics, and Epistemology of Demonstratives and Other Indexicals. In *Themes from Kaplan*, edited by Joseph Almog, John Perry and Howard Wettstein. New York and Oxford: Oxford University Press, pp.481-563.
Karmiloff-Smith, Annette. 2007. Williams Syndrome. *Current Biology* 17(24):R1035-R1036.
Karmiloff-Smith, Annette, Janice H. Brown, Sarah Grice, and Sarah Paterson. 2003. Dethroning the Myth: Cognitive Dissociations and Innate Modularity in Williams Syndrome. *Developmental Neuropsychology* 23(1&2):227-242.
Karmiloff-Smith, Annette, E.S. Klima, U. Bellugi, J. Grant, and S. Baron-Cohen. 1995. Is there a social module? Language, face processing and theory of mind in individuals with Williams syndrome. *Journal of Cognitive Neuroscience* 7(2):196-208.
Kataria, Sudesh, Donald J. Goldstein, and Theodore Kushnick. 1984. Developmental Delays in Williams ("Elfin Facies") Syndrome. *Applied Research in Mental Retardation* 5:419-423.
Kövecses, Zoltán. 2002. *Metaphor: A Practical Introduction*. Oxford: Oxford University Press.

Laws, Glynis, and Dorothy Bishop. 2004. Pragmatic language impairment and social deficits in Williams syndrome: a comparison with Down's syndrome and specific language impairment. *International Journal of Language & Communication Disorders* 39(1):45-64.
Lyons, J. 1977. *Semantics*. 2 vols. Cambridge: Cambridge University Press.
Marr, David. 1982. *Vision: A Computational Investigation into the Human Representation and Processing of Visual Information*. San Francisco: W.H. Freeman and Company.
Martens, Marilee A., Sarah J. Wilson, and David C. Reutens. 2008. Research Review: Williams syndrome: a critical review of the cognitive, behavioral, and neuroanatomical phenotype. *The Journal of Child Psychology and Psychiatry* 49(6):576-608.
Martínez-Manrique, Fernando, and Agustín Vicente. 2009. On the Psychological Reality of Minimal Propositions. In *Utterance Interpretation and Cognitive Models*, edited by Philippe De Brabanter and Mikhail Kissine. Bingley, UK: Imprint, pp.1-25.
Mervis, Carolyn B. 2003. Williams Syndrome: 15 Years of Psychological Research. *Developmental Neuropsychology* 23(1&2):1-12.
Mervis, Carolyn B., and Angela M. Becerra. 2007. Language and Communicative Development in Williams Syndrome. *Mental Retardation and Developmental Disabilities Research Reviews* 13:3-15.
Mervis, Carolyn B., Byron F. Robinson, Jacquelyn Bertrand, Colleen A. Morris, Bonita P. Klein-Tasman, and Sharon C. Armstrong. 2000. The Williams syndrome cognitive profile. *Brain and Cognition* 44:604-628.
Meyerson, Marion D., and Ruby A. Frank. 1987. Language, speech and hearing in Williams syndrome: intervention approaches and research needs. *Developmental Medicine and Child Neurology* 29:258-270.
Morris, Charles W. 1955 [1938]. Foundations of the Theory of Signs. In *International Encyclopedia of Unified Science*, edited by Otto Neurath, Rudolf Carnap and Charles W. Morris. Chicago: The University of Chicago Press, pp.77-137. Original edition, 1938. Foundations of the Theory of Signs. In *International Encyclopedia of Unified Science*. 1(2):1-59.
Palmer, F.R. 1981. *Semantics*. 2nd ed. Cambridge: Cambridge Univeristy Press.
Papafragou, Anna. 1996. On metonymy. *Lingua* 99:169-195.
Pinker, Steven. 1999. *Words and Rules: The ingredients of language*. New York: Harper Collins.
Pober, Barbara R., and Elisabeth M. Dykens. 1996. Williams syndrome: An overview of medical, cognitive, and behavioral features. *Child and Adolescent Psychiatric Clinics of North America* 5(4):929-943.
Preminger, Alex, and T.V.F. Brogan, eds. 1993. *The New Princeton Encyclopedia of Poetry and Poetics*. Princeton: Princeton University Press.
Prinz, Jesse J. 2006. Is the Mind Really Modular? In *Contemporary Debates in Cognitive Science*, edited by Robert J. Stainton. Malden, MA: Blackwell Publishing, pp.22-36.
Recanati, François. 1989. The Pragmatics of What is Said. *Mind and Language* 4:295-329.
———. 1993. *Direct Reference: From Language to Thought*. Oxford: Blackwell Publishers.
———. 2001. What is Said. *Synthese* 128:75-91.
———. 2002. Unarticulated Constituents. *Linguistics and Philosophy* 25(3):299-345.
———. 2004. *Literal Meaning*. Cambridge: Cambridge University Press.
———. 2010. *Truth-Conditional Pragmatics*. Oxford: Oxford University Press.

Riby, Deborah M., and Elisa Back. 2010. Can individuals with Williams syndrome interpret mental states from moving faces? *Neuropsychologia* 48:1914-1922.
Robbins, Philip. 2007. Minimalism and Modularity. In *Context-Sensitivity and Semantic Minimalism*, edited by Gerhard Preyer and Georg Peter. Oxford: Oxford University Press, pp.303-319.
Schubert, C. 2008. The genomic basis of the Williams-Beuren syndrome. *Cellular and Molecular Life Sciences* 66:1178-1197.
Searle, John. 1979a. Metaphor. In *Metaphor and Thought*, edited by A. Ortony. Cambridge: Cambridge University Press, pp.92-123.
Searle, John R. 1969. *Speech Acts: An Essay in the Philosophy of Language*. Cambridge: Cambridge University Press.
———. 1978. Literal Meaning. *Erkenntnis* 13(1):207-224.
———. 1979b. *Expression and Meaning*. Cambridge: Cambridge University Press.
———. 1980. The Background of Meaning. In *Speech Act Theory and Pragmatics*, edited by J. Searle, F. Kiefer and M. Bierwisch. Dordrecht: Reidel, pp.221-232.
Sellars, Wilfrid. 1974. Meaning as Functional Classification (A Perspective on the Relation of Syntax to Semantics). *Synthese* 27(3/4):417-437.
Sperber, Dan, and Deirdre Wilson. 1995. *Relevance: Communication and Cognition*. 2nd ed. Oxford: Blackwell.
Stanley, Jason. 2007. Context and Logical Form. In *Language in Context*. Oxford: Clarendon Press, pp.30-68. Original edition, Stanley, Jason. 2000. Context and Logical Form. *Linguistics and Philosophy* 23:391-424.
Stern, Josef. 1985. Metaphor as Demonstrative. *Journal of Philosophy* 82:677-710.
Stojanovik, Vesna. 2006. Social interaction deficits and conversational inadequacy in Williams syndrome. *Journal of Neurolinguistics* 19:157-173.
Stojanovik, Vesna, Mick Perkins, and Sara Howard. 2004. Williams syndrome and specific language impairment do not support claims for developmental double dissociations and innate modularity. *Journal of Neurolinguistics* 17:403-424.
Sullivan, Kate, Ellen Winner, and Helen Tager-Flusberg. 2003. Can Adolescents With Williams Syndrome Tell the Difference Between Lies and Jokes? *Developmental Neuropsychology* 23(1&2):85-103.
Szabó, Zoltán Gendler. 2006. The Distinction between Semantics and Pragmatics. In *The Oxford Handbook of Philosophy of Language*, edited by Ernest Lepore and Barry C. Smith. Oxford: Oxford University Press, pp.361-389.
Tager-Flusberg, Helen, and Kate Sullivan. 2000. A componential view of theory of mind: evidence from Williams syndrome. *Cognition* 76:59-89.
Temple, Christine M., Mayella Almazan, and Susan Sherwood. 2002. Lexical skills in Williams Syndrome: a cognitive neuropsychological analysis. *Journal of Neurolinguistics* 15:463-495.
Travis, Charles. 1985. On What is Strictly Speaking True. *Canadian Journal of Philosophy* 15(2):187-229.
———. 1996. Meaning's Role in Truth. *Mind* 100:451-466.
———. 2000. *Unshadowed Thought: Representation in Thought and Language*. Cambridge, MA: Harvard University Press.
Wieland, Nellie. 2010. Context Sensitivity and Indirect Reports. *Philosophy and Phenomenological Research* LXXXI(1):40-48.

Williams, J.C.P., B.G. Barratt-Boyes, and J.B. Lowe. 1961. Supravalvular Aortic Senosis. *Circulation* 24:1311-1318.

Wilson, Deirdre, and Dan Sperber. 2004. Relevance Theory. In *The Handbook of Pragmatics*, edited by Laurence R. Horn and Gregory Ward. Malden, MA: Blackwell Publishing, pp.607-632.

Winner, Ellen, Gail Windmueller, Elizabeth Rosenblatt, Laurie Bosco, Edella Best, and Howard Gardner. 1987. Making Sense of Literal and Nonliteral Falsehood. *Metaphor and Symbol Activity* 2(1):13-32.

Wittgenstein, Ludwig. 2001. *Philosophical Investigations*. Translated by G. E. M. Anscombe. 3rd ed. Malden, MA: Blackwell Publishing.