The Semantics of *Nothing If Not* Constructions

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Abstract

A nothing if not *or* NIN *construction is a construction such as "Phil is nothing if not deliberate." This paper aims at elucidating the basic truth conditions of these constructions, which to our knowledge have not been discussed in previous linguistics literature. If an entity is "nothing if not" P, it must be P and it cannot be a borderline case of P. Although these constructions contain an* if *clause, they do not license the same patterns of inference, e.g. Modus Ponens, as normal conditional constructions. We conduct an acceptability study that motivates treating "nothing if not" as a modifier of the predicate with which it is syntactically associated rather than as a fragment of a conditional. A formal account of* NIN *construction truth conditions is introduced using* Delineation Tolerant, Classical, Strict (DelTCS) *Burnett (2012, 2013) in combination with a special modal accessibility relation R^P_{bd} the function of which is to delete boundary cases of P. A* NIN *construction affirms that the subject is in its predicate's denotation in all possible worlds, and is thus not a borderline case of the predicate.*

1 Introduction

The goal of this paper is to provide the basic truth conditions of the *nothing if not* (*NIN*) construction. *NIN* constructions are constructions such as the following:

1) "Palin's book was *nothing if not* a score settler."[1]
2) "Schizophrenia is *nothing if not* mysterious."[2]
3) "His vision is *nothing if not* the American dream of self-making."[3]
4) "The trades made by Denver last week did *nothing if not* send a message to the rest of the Nuggets that chemistry is going to be stressed in the coming season."[4]
5) "Of course, the legendary hero of America is *no one if not* the self-made man."[5]

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[1]Jacobs, Samuel P. *Palin's Ghost.* Newsweek. 2011.
[2]*SCHIZOPHRENIA IN CHILDREN; INSIDE THE WORLD OF CHILDHOOD SCHIZOPHRENIA.* ABC_20/20. 2011.
[3]Curnutt, Kirk. *Direct addresses, narrative authority, and gender in Rebecca Harding Davis's 'Life in the Iron...'.* Style. Summer 94, Vol. 28 Issue 2, p146, 23p. 1994 (Summer).
[4]EDDIE SEFKO; staff. *Rockets face decision on Cassell.* Houston Chronicle. SPORTS; NBA Notebook; Pg. 13. 1996.
[5]Lookingbill, Brad. *Making business history: An annotated bibliography.* American Studies International. Vol 35, Issue 3, p4, 19p. October 1997.

To our knowledge, these constructions have not been studied before in the literature. *NIN* constructions generally consist of a *subject*, a *main verb*, "nothing if not" (or a variation of it, e.g. 5), and a *main predicate*. These terms, which will be used throughout the paper, have the denotations illustrated below for the *NIN* construction "John is nothing if not tall":

Subject	Main Verb	"Nothing If Not"	Main Predicate
"John	is	nothing if not	tall."

The main verb is the highest matrix V (or Aux) in the sentence. The subject may be syntactically defined as the sentence-level specifier in the matrix clause, though semantically it is usually the theme (or agent in the case of an eventive main predicate). "Nothing if not" is a string that exists inside the sentence.[6] The main predicate is the semantic predicate of which the subject is predicated.

Despite containing an "if," *NIN* constructions are not conditionals. "Nothing if not" modifies a scalar predicate, indicating that the predicate is true of the subject and that the subject is not a **borderline case** of the predicate, an entity for which the predicate is neither clearly true nor clearly false. Despite not being a conditional, the construction retains a modal flavor: "nothing if not" introduces a modal necessity operator along with a special accessibility relation R^P_{bd}, for which borderline cases of P are only possibly in the extension of P. Since an entity that is "nothing if not" P is P in all possible worlds, borderline cases of P are excluded based on this accessibility relation.

The notion of a borderline case is formalized using a fragment of Burnett's paraconsistent logic *Delineation Tolerant, Classical, Strict* (*DelTCS*) (2012, 2013), wherein a predicate's borderline cases are entities in both the predicate's tolerant extension and its negation's tolerant extension. The *tolerant extension* of P is the set of entities a for which $P(a)$ is **tolerantly satisfied**, a concept incorporated from the logic *Tolerant, Classical, Strict* (*TCS*) Cobreros et al. (2010). A formula of the form $P(a)$ is tolerantly satisfied if there exists some entity that is in the extension of P and does not differ discernibly from a with respect to P: that is, is in a relation of **indifference** with a for predicate P. Two entities are indifferent with respect to a predicate if the exclusion of one from the predicate's extension cannot be justified if the other is within it. For instance, if two entities only differ in height by one millimeter, in many contexts it would be impossible for one of them to be considered "tall" while the other is not. Because one's being tall is sufficient for the other being tall, the two entities are indifferent with respect to "tall."

The dual of tolerant satisfaction is **strict satisfaction**. A formula of the form $P(a)$ is strictly satisfied if a is in the extension of P along with all entities to which a is indifferent with respect to P. A clear case of P is an entity in the predicate's *strict extension*, the set of all entities a for which $P(a)$ is strictly satisfied.

While both Burnett (2012, 2013) and Cobreros et al. (2010) use a binary operator to define which pairs of entities are indifferent to one another for each predicate, and by extension the tolerant and strict denotations for each predicate, the present proposal defines tolerant, classical and strict extensions of predicates using a three-valued Strong Kleene logic based on Muskens (1995) and Krahmer (1998). The tolerant extension of a predicate is the union of its *K3* extension and its truth-value gap. The tolerant negation of an atomic formula is the union of its predicate's **antiextension**, the set of entities for which the expression is false, and its truth value

[6] See Appendix 6.1 for additional variations on "nothing if not."

gap. Boundary cases of a predicate are cases for which the predicate and its negation are both tolerantly true. This approach is taken because the task at hand - defining the basic truth conditions of *NIN* constructions - does not require a system more complex, involving the indifference relation. The structures are in place, however, to recast the theory in terms of an indifference operator, and future work may seek to do just this.

DelTCS will be augmented with possible worlds, modal operators, and an accessibility relation R^P_{bd}. An entity is "nothing if not" P if it is necessarily P with respect to accessibility relation R^P_{bd}. It is necessarily P in a world for R^P_{bd} if it is in the strict extension of P in that world. Thus, the modal necessity operator and accessibility relation are one way of ensuring the main predicate is strictly true of the subject and the subject is not a borderline case of the predicate.

Supporting this theoretical account of the truth conditions for *NIN* constructions, we report the results of an acceptability study revealing that participants prefer *NIN* constructions with stative rather than eventive main predicates. Since these constructions are sensitive to the main predicate in a way that conditionals are not, this supports an analysis in which "nothing if not" modifies the main predicate and is not semantically a conditional.

Below is an overview of the paper.

1.1 Overview of thesis

In the remainder of the introduction, the most immediate differences between *NIN* constructions and conditionals is revealed and the basic entailments of *NIN* constructions are given. Modus Ponens cannot be sound when applied to *NIN* constructions, and Modus Tollens is questionably informative for them. A *NIN* construction entails that its subject is a clear case of its main predicate.

In Part 2 we present the acceptability study, report its results and discuss the findings. We tested the acceptability of *NIN* constructions when the position of the *if* clause, the composition of the *if* clause and the choice of main verb are manipulated. Each item in the experiment was preceded by a two-sentence narrative and was evaluated for both acceptability and truth in context. The results of the experiment reveal that participants strongly prefer "be" to "do" as a main verb when the *if* clause is in its unarticulated "if not" form. This shows that the acceptability of *NIN* constructions is sensitive to the eventive vs. stative nature of the main predicate. In this way, *NIN* constructions are different from conditional constructions and require a semantics in which they are modifiers of the main predicates with which they are syntactically associated.

In Part 3, an informal account of the basic truth conditions of *NIN* constructions is provided. An entity is "nothing if not" P if it is P and is not a borderline case of P. First, we motivate this basic intuition. *NIN* constructions entail that their subject is a clear case of the main predicate. We take as a starting point that the main predicates in *NIN* constructions are scalar, as an overview of the construction's distribution in the *Corpus of Contemporary American English* (*COCA*) reveals that the main predicate is scalar in a vast majority of cases. That an entity is a clear case of a scalar predicate indicates that it is both true of the predicate and not a borderline case of it. Second, we introduce informally the formal systems we will be working with. We give an overview of our *DelTCS* fragment and we drop the indifference relation, recasting tolerant, classical and strict extensions of predicates in terms of the regions of truth in *K3*. Third, we show how our basic intuition about the truth conditions of *NIN* constructions may be realized within the formal system. If an entity is "nothing if not" P, P is *strictly* true of it. The semantic contribution if "nothing if not" is a modal necessity operator evaluated with respect to accessibility relation R^P_{bd}. R^P_{bd} ensures that while the borderline cases of P shuffle between the extension and antiextension of P across possible worlds, the entities in the extension of P remain in the extension of P in all possible worlds. Thus if an entity is "nothing if not" P, it is P in all possible worlds and thus a strict case of P, not one of the borderline case shufflers.

In Part 4, the formal analysis of basic *NIN* construction truth conditions is provided. We introduce the modified fragment of *DelTCS* and add a modal component to the logic, including the constraints on R^P_{bd}. The formal contribution of "nothing if not" is then introduced, and an example illustrates the basic truth conditions.

Finally, in Part 5, the directions for future research on this construction are discussed. It must be determined whether "nothing if not" forces a scalar interpretation of its main predicate; if it does not, the current account must be generalized to provide truth conditions for *NIN* constructions with non-scalar main predicates. Although these constructions could be idiomatic, it must be investigated whether or not they may be given a compositional analysis. Although we here provide the basic truth conditions for *NIN* constructions, much work may be done untangling the relationship between the semantic contribution of an *if* clause and the effect *NIN* and similar constructions have on scale structure of the main predicates they combine with.

1.2 Differences between *NIN* constructions and conditionals

Here, the immediate differences between conditionals and *NIN* constructions are explored.

NIN constructions do not participate in the patterns of inference that normal indicative conditionals participate in. Most notable is that Modus Ponens, reasoning from the truth of a conditional's antecedent to the truth of its consequent, is not a sound pattern of inference applied to *NIN* constructions:

	Conditional	**Nothing if not**	**Modus Ponens**
Premise 1	"If John isn't tall, Bob is."	"John is nothing if not tall."	$A \rightarrow B$
Premise 2	"John isn't tall."	"John is not tall."	A
Conclusion	"Bob is tall."	#"John is nothing."	$\therefore /B$

Suppose it is true that if John isn't tall, Bob is tall. If we also grant that John isn't tall, it must follow that Bob is tall - else our conditional construction would be false. However, if it is true that John is nothing if not tall, it does not follow that if John is not tall he is nothing. Indeed, it cannot be the case that John is both not tall and nothing if not tall, nor is very clear what it would mean for him to be nothing.

Modus Tollens, reasoning from the falsity of the consequent to the falsity of the antecedent, fares better for *NIN* sentences, but it is questionably informative:

	Conditional	**Nothing if not**	**Modus Tollens**
Premise 1	"If John isn't tall, Bob is."	"John is nothing if not tall."	$A \rightarrow B$
Premise 2	"Bob isn't tall."	"John is not nothing."	$\neg B$
Conclusion	"John is tall."	"John is tall."	$\therefore /\neg A$

For the conditional example, if it is true that Bob is tall if John is not tall, then if Bob is not tall John must be tall. This is because if John was not tall, then Bob would be tall. Since Bob is not tall, it can't be the case that John isn't tall. For the *NIN* example, if John is nothing if not tall, he both clearly exists (if this is what it means to not be "nothing"), and he is tall. However, it is difficult to tell if the conclusion is an informative inference or if it simply follows from Premise 1. If Premise 2 is presupposed by Premise 1 (as speaking of John presupposes he exists), Premise 1 may entail the conclusion precisely because Premises 1 presupposes the negation of its consequent. Premise 3 would thus implicitly follow by a form of Modus Tollens reasoning. However, the construction may have meaning even when Premise 2 is questionable. Consider the following example:

> 6) "This is where you pray; this is where you study; this is where you promise. And Dominic was nothing if not promise (even if he was nothing in actuality)."[7]

What an example like this shows us is that the construction does not rely solely on this process of inference for its meaning. If Dominic is nothing, then Premise 2 for Modus Tollens is false and yet the *NIN* construction still presumably has meaning. The construction appears to have a semantic contribution that is independent of the truth or falsity of Premise 2. It is not clear what Premise 2 means to begin with, and whatever it means, (6) seems to be a case in which the construction is meaningful while Premise 2 is contradicted. If the conclusion can be entailed without the truth of Premise 2, the conclusion follows from Premise 1 alone and Modus Tollens doesn't follow informatively.

We therefore sharply distinguish between conditional constructions and *NIN* constructions on the grounds that for *NIN* constructions Modus Ponens is not sound and Modus Tollens is questionably informative.

1.3 Basic entailments of *nothing if not*

Unlike conditional constructions, which state the truth of their consequent given the truth of the *if* clause, *NIN* constructions seem to simply affirm the truth of their *if* clause. This is visible in the following examples:

$$\text{6) ``John is nothing if not tall, } \left\{ \begin{array}{l} \text{\#but he isn't tall} \\ \text{\#but he's only a little bit tall} \end{array} \right\}\text{.''}$$

Because both of these sentences are infelicitous it seems that "John is nothing if not tall," entails both that he is tall and that he is not lukewarmly so.

Note that this sentence does not indicate that John is *only* describable as tall, or that tallness is even his main defining characteristic. This is evident in that a single individual may be "nothing if not" more than one thing:

> 7) "...Bartleby chooses civil disobedience, for his conditional is nothing if not civil and nothing if not disobedient."[8]

If "nothing if not civil" indicated that Bartleby's conditional was only civil, it could not also be true that it is disobedient. Furthermore, if the construction meant that civility was its primary defining characteristic, then it would have to be the cases that both civility and disobedience

[7] Donatich, John. *The Variations: A Novel*. New York. Henry Holt and Co. 1st edition. 2012.
[8] De, La Durantaye, Leland. "From Spectacle to Shekinah." *Giorgio Agamben: A Critical Introduction*. Stanford, CA. Stanford UP: 2009. Google Books. Web. 9 March 2014.

were each its primary, defining characteristic. Since this is not possible, *NIN* constructions do not have any such entailments.

It therefore seems that *NIN* constructions entail that their main predicate is at least true of the subject. They do not rule out the truth of other predicates applied to the subject, though they entail that the main predicate uncontroversially applies to the subject.

In this section it has thus been shown that Modus Ponens can't be sound for *NIN* constructions and Modus Tollens is questionably informative for *NIN* constructions. *NIN* constructions are thus distinguished from conditionals, for which Modus Ponens and Modus Tollens may be sound and informative. They entail that the main predicate in their "if" clause is true of their subject and that the subject is a clear case of the main predicate.

2 Acceptability Study

Now that *NIN* constructions have been introduced, we report the results of a *NIN* construction acceptability study and discuss the findings. The acceptability of several manipulations on *NIN* construction form, including the fronting of the *if* clause, the introduction of a fully articulated clause following "if", and the choice of main verb, were tested. The results of the experiment reveal that the acceptability of the construction is sensitive to the stative vs. eventive nature of the main predicate when its *if* clause is in its unarticulated "if not" form. This provides additional evidence that the construction is not a conditional and that "nothing if not" modifies a stative predicate.

2.1 Background

Here, we show two variations on *NIN* construction form and illustrate the stative vs. eventive differences that occur when "be" and "do" are main verbs. The experiment is designed to determine if differences in acceptability for stative vs. eventive main verbs manifest when a *NIN* construction is of a form that is ambiguous between a *NIN* construction and a conditional.

In this experiment we test the acceptability of several different alternations of *NIN* constructions. While (8) exemplifies the *NIN* sentence form with which we are familiar, (9) and (10) are variations on this form that have been shown to exist as well:

> 8) "Schizophrenia is nothing if not mysterious." (canonical *NIN* construction form)
> 9) "*. . . if art is not an expressive medium and an act of form* it is nothing."[9] (fronted *if* clause)
> 10) "The enlightenment was nothing if *it was not* democratic."[10] (fully articulated *if* clause)

In rare examples like (9), the *if* clause of the *NIN* construction has been fronted. It is well-known that conditionals may have *if* clauses that are fronted or postposed, so we expect that constructions such as (9) are no less acceptable if *NIN* constructions are conditionals. In (10) "if" follows a fully-articulated clause. If *NIN* constructions are not conditionals, then (10) is either ambiguous between a *NIN* construction reading (to which Modus Ponens cannot be applied) and an

[9] Grãna, César. John Dewey's Social Art and the Sociology of Art. *Fact and Symbol: Essays in the Sociology of Art and Literature*. Transaction Publishers. 1994. Pg. 147. Google Books.
[10] Eidelberg, Paul. The end of ideology and the decay of politics. *Perspectives on Political Science*. Vol 20. Issue 4. pg. 203. 8 p. 1991 (Fall).

indicative conditional reading (to which Modus Ponens can be applied) or it is simply not a *NIN* construction. Either way, if there are differences in acceptability between constructions such as (10) and those such as (8) this suggests that there are two distinct readings for (10), and that a distinction between *NIN* constructions and conditionals must be made.

The acceptability of a *NIN* construction may be sensitive to the choice of main verb. We have seen that *NIN* constructions may have "do" as a main verb rather than "be":

> 11) "The trades made by Denver last week *did* nothing if not send a message to the rest of the Nuggets that chemistry is going to be stressed in the coming season."

Whereas the main predicate usually has *stative* aspect when the main verb is "be" it has *eventive* aspect when the main verb is "do".

According to Kearns (2000), states are *homogeneous*, or unchanging from moment to moment, while events are *heterogeneous*, or varying internally from moment to moment. Events may also be telic or may lack duration, while states are always atelic and durative. In (8), it is clear that schizophrenia's being mysterious is stative, as the mystery is unchanging from moment to moment, it has mystery over a duration of time, and there is no conveyed endpoint of its mysteriousness. Meanwhile, the message sent by Denver's trade in (11) is eventive, as it has an endpoint (the point after which the message has been sent) and arguably has no duration.

We expect *NIN* constructions to be sensitive to the stative vs. eventive nature of their main predicates because the main predicates of *NIN* constructions are primarily gradable adjectives such as "mysterious" which are stative rather than eventive in nature. This is discussed in greater detail in section 3.1.

2.2 Hypotheses

We make the following two hypotheses:

> **Hypothesis 1**: *NIN* constructions will be more acceptable when their *if* clause is postposed rather than fronted.
>
> **Hypothesis 2**: The acceptability of *NIN* constructions will be more sensitive to the stative vs. eventive nature of their main predicate in their *if not* form as opposed to their fully articulated *if* clause form.

Hypothesis 1 is motivated by our choice of canonical form for a *NIN* construction, and this was motivated by the rarity of examples with fronted *if* clauses such as (9).

Hypothesis 2 is motivated on the one hand by the ambiguity between *NIN* constructions and indicative conditionals when the *if* clause is in its fully articulated form, and on the other hand by the fact that there is an imbalance in the distribution of main predicates in *NIN* constructions. If *NIN* constructions with fully articulated *if* clauses are indeed ambiguous between two readings then differences in acceptability for stative vs. eventive predicates should be more pronounced in the "if not" cases than the fully articulated *if* clause cases.

2.3 Design

The experiment had a $2 \times 2 \times 2$ design. There were 32 items and 48 fillers. The factors, illustrated in TABLE 1, were:

1) fully articulated *if* clause (henceforth Cond) vs. non-articulated *if* clause (henceforth Nin, for "Nothing if not")
2) fronted *if* clause (Early) vs. postposed *if* clause (Late)
3) main verb "be" (Be) vs. main verb "do" (Do)

Participants were asked to rate the ACCEPTABILITY of the sentence and each response was recorded on a scale from -2 to 2, least to most acceptable. The TRUTH of the sentence in context was counterbalanced throughout the experiment and for each item the participant's truth-judgment was requested (True, False, Unknown). The fillers were split (20-25 items each) for whether their context affirmed or contradicted the truth of the item. We also varied the acceptability of the items, using both items that were grammatically unacceptable and items that were acceptable though infelicitous in context. 7 fillers were unacceptable and 6 were infelicitous in context.

The fillers included idioms, conditionals, quantifiers and negation in addition to semantically simple sentences, so as to not draw attention to the items with "nothing if not."[11]

2.4 Method and Procedure

The self-paced experiment was run on Ibex software through the UCSC Linguistics Research Center. Participants were presented with each item, preceded by a two-sentence narrative that either supported the truth of or contradicted the item.

Participants were asked to judge the TRUTH of each item given the narrative and to judge its

[11] See Appendix 6.2 for more items and fillers from this experiment.

	Be		**Do**	
	Cond	**Nin**	**Cond**	**Nin**
Early	"If he isn't a helpful friend, Bob is nothing."	"If not a helpful friend, Bob is nothing."	"If he doesn't help his friends, Bob does nothing."	"If not help his friends, Bob does nothing."
Late	"Bob is nothing if he isn't a helpful friend."	"Bob is nothing if not a helpful friend."	"Bob does nothing if he doesn't help his friends."	"Bob does nothing if not help his friends."

Table 1: *The factors of the experiment illustrated through the target sentence* "Bob is nothing if not a helpful friend." *"Be" and "Do" represent the choice of main verb. "Cond" indicates that the* if *clause is fully articulated while "Nin" indicates that the sentence is in* if not *form. "Early" and "Late" indicate that the* if *clause is fronted or postposed respectively.*

ACCEPTABILITY. We used the fillers to filter out participants who did not complete the experiment properly.

For each question the narrative and item were visible for reference. Participants were given 4 practice items to judge before the start of the experiment.

2.4.1 Participants

We tested 49 UCSC undergraduates, giving class credit in return for their participation. We dropped 2 participants based on their performance assigning the correct truth value to fillers. The total number of observations was 1502.

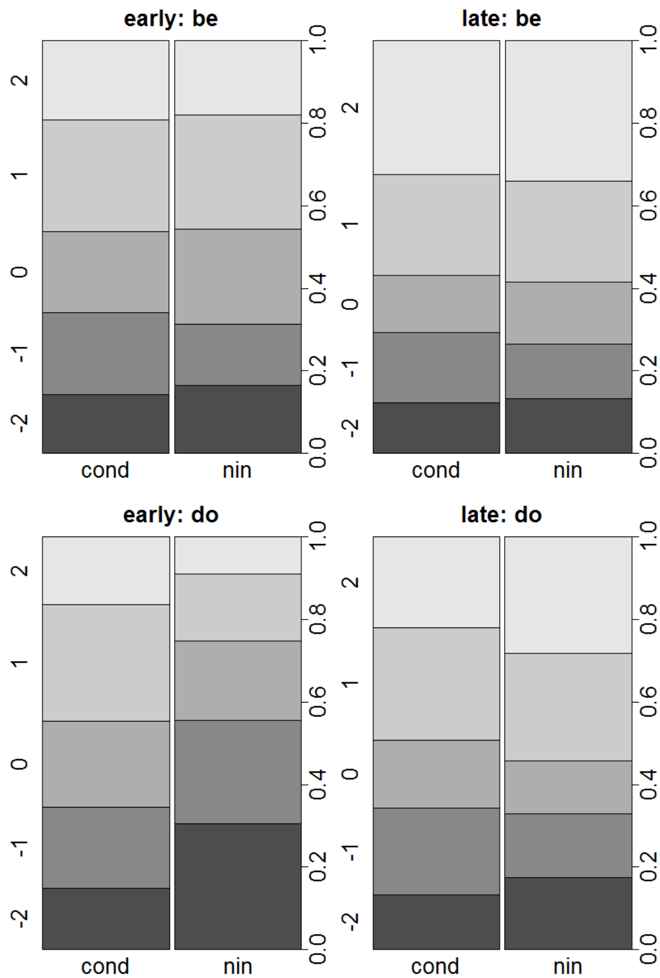

Figure 1: *The interaction of each level with respect to* ACCEPTABILITY. *The negative effect on preposed "if not"* NIN *constructions is visible in the bottom left graph.*

2.5 Results

2.5.1 Data

The barplot shown in FIGURE 1 summarizes distribution of each level with respect to ACCEPTABILITY. The visible trend is that *NIN* constructions are most acceptable when the *if* clause is postposed and the main verb is "be" (top right). They are highly unacceptable in when the *if* clause is preposed and unarticulated while the main verb is "do" (bottom left).

2.5.2 Frequentist Modeling

Because our ACCEPTABILITY variable is ordinal, we used ordered probit regression to analyze our data.[12] Cond, Early, and Be were the reference level of each of the three factors. True was the reference level for TRUTH.

The most effective model for our data was a full interaction model with random effects for participants and items (see TABLE 2). In terms of fixed effects there were highly significant negative effects for False and Unknown levels as expected. Postposing the *if* clause had a significant positive effect on acceptability. There was a marginally significant negative interaction between Late and Do. The most significant observed interaction occurred when a non-articulated *if* clause coincided with "do" as a main verb; the sentence was deemed much less acceptable in these cases. There appeared to be a highly significant positive three-way interaction between Do, Nin, and Late, though this result is expected based on positive effect contributed by Late. Observing the effects of Nin and Do considering only Late cases reveals no significant negative effect of the two factors ($P = 0.81$).

2.6 Discussion

The negative acceptability effects of sentences that are not true or whose truth value is unclear have been widely observed in linguistics research. Our primary interests, however, are the effects on acceptability contributed by manipulations other than TRUTH.

The above patterns of acceptability suggest that *NIN* constructions are sensitive to the eventive vs. stative nature of their main predicate. Constructions containing a fronted, non-articulated *if*

[12] The R package 'ordinal' was used to create our models. See References.

	Estimate Std.	Std. Error	$Pr(\| > z\|)$
False	-1.05	0.07	**$<$ 2e-16**
Unknown	-0.74	0.10	**1.5e-13**
Late	0.37	0.11	**1.0e-3**
Do	0.01	0.11	**0.91**
Nin	1.4e-3	0.11	**0.99**
Late:Do	-0.27	0.16	**0.09**
Late:Nin	-0.03	0.16	**0.86**
Do:Nin	-0.60	0.16	**1.5e-4**
Late:Do:Nin	0.66	0.23	**3.39e-3**

Table 2: *Coefficient fixed effects for* ACCEPTABILITY *in full-interaction model.*

clause and "do" as the main verb fared extremely poorly compared constructions from the other conditions. There is no significant negative effect for either Do or Nin on their own, but together they seemed to render the sentence much less acceptable to participants. This indicates that when a *NIN* construction is in its non-articulated "if not" form, its acceptability is reduced for eventive predicates. Because there was no such interaction seen between the Do and Cond conditions, it would appear that Hypothesis 2 is correct. Items from the Nin condition, which were unambiguously *NIN* constructions fared much worse for eventive predicates than items from the Cond condition, which were either ambiguous between indicative conditionals and *NIN* constructions or not *NIN* constructions at all.

Hypothesis 1 also appears to be correct. *NIN* constructions were deemed more acceptable in general when their *if* clause was postposed rather than fronted. This may be predicted in an analysis in which "nothing if not" is a modifier of the main predicate, because "nothing if not" must be evaluated as a phrase rather than as parts of two disjoint clauses. In this analysis, "if" canonically comes after than main verb rather than before it.

Conclusion:

Because the form of the predicate has such an extreme effect on acceptability for the Nin condition but not the Cond condition, this motivates a distinction between *NIN* constructions and conditionals, as well as a semantic theory for *NIN* constructions that focuses more heavily on the main predicates with which they are syntactically associated. We will thus adopt a theory in which "nothing if not" *modifies* the main predicate and should not be semantically understood as a conditional.

3 Informal Account of *NIN* Truth Conditions

Here we provide an informal elucidation of the truth conditions of *NIN* constructions. Section 4 is a formal account of what follows in this section.

NIN constructions assert that the main predicate is true of the subject and that the subject is a clear case of the main predicate. We revisit the basic entailments of a *NIN* construction and combine the simple insights they provide with the results of a corpus study indicating "nothing if not" primarily modifies **scalar** predicates, predicates that are gradable and may participate in comparative constructions. Since scalar predicates have borderline cases, entities for which they are neither clearly true nor false, the notion that the subjects of *NIN* constructions are clear cases of their main predicates may be understood more formally as them being in the extension of their main predicate and not a borderline case of it.

This analysis of the truth conditions of *NIN* constructions invokes a fragment of the logic *DelTCS* Burnett (2012, 2013), which treats borderline cases as entities that the predicate is both true and false of in one of its three forms of satisfaction, tolerant satisfaction. Instead of tolerant, classical and strict predicate extensions on an indifference relation as in *DelTCS*, we use a partial Strong Kleene logic as in Muskens (1995) and Krahmer (1998), redefining tolerant, classical and strict extensions in terms of a three-valued system. The definition of borderline cases in *DelTCS* remains the same. This approach does a better job of revealing the simplicity of our proposal and provides a generic framework that can be specialized with ease in the future.

Ultimately, "nothing if not" introduces a modal necessity operator and a special accessibility relation R^P_{bd}, the function of which is to eliminate boundary cases of a predicate P from its extension, thereby ensuring that the subject is squarely within the extension of P.

First, we will motivate treating *NIN* constructions as modifiers of scalar predicates and as indicating that the subject is not a borderline case of the main predicate. Then we will introduce the *DelTCS* framework. The *DelTCS* definitions of tolerant, classical and strict extensions of predicates will then be exchanged with definitions based on the three-valued *K3* system: a predicate's tolerant extension is the union of its *K3* extension and truth-value gap, and a predicate's strict extension is its *K3* extension. Its classical extension is still the extension denoted by applying the interpretation function, but two interpretation functions will be used in this proposal I^+ and I^-, so classical extensions are defined slightly differently. After the extensions are recast, machinery for modality is introduced to *DelTCS* and the truth conditions of *NIN* constructions are revealed.

3.1 Background

NIN constructions entail that the main predicate must be uncontroversially true of the subject. A corpus investigation of their distribution reveals to us that they prefer that main predicate to be scalar in nature. Combining these two notions, we say that subject must be true of its main predicate and not a borderline case of it.

As mentioned previously, an entity is "nothing if not" P if it is P and is a clear case of P. Example (12) as given to show this. (Contrast it with example (13))

$$\text{12) “John is nothing if not tall, } \left\{ \begin{array}{l} \text{\#but he isn't tall} \\ \text{\#but he's only a little bit tall} \end{array} \right\}\text{.”}$$

$$\text{13) “John is tall } \left\{ \begin{array}{l} \text{\#but he isn't tall} \\ \text{but he's only a little bit tall} \end{array} \right\}\text{.”}$$

Whereas both constructions entail that John is tall, the *NIN* construction alone entails that he is a clear case of tallness. We thus take as one starting point that the main predicate in a *NIN* construction must be clearly true of the subject.

A second observation influencing this analysis is that the vast majority of *NIN* constructions apply to scalar adjective predicates. A preliminary search through the *Corpus of Contemporary American English* (COCA) revealed that out of 380 observed *NIN* constructions, 255 (≈67%) had a relative scalar adjective as the main predicate.[13] Roughly an additional 6% had an NP modified by a scalar adjective as its main predicate and roughly 3% had an absolute adjective as its main predicate. Because the main predicates of these constructions are overwhelmingly scalar adjectives, we look to the semantics of scalar predicates for our a semantics of *NIN* constructions. The notion that "nothing if not" tends to modify scalar predicates is consistent with the intuitive analysis suggested that their main predicates have "clear cases" and that the subjects are clear cases of the main predicate.

If "nothing if not" modifies scalar adjectives, the basic truth conditions of a *NIN* construction must ensure that the subject is not a *borderline case* of the predicate, an entity that is near the middle of a predicate's scale and is thus both true and false of the predicate.[14] It's a marked

[13] See Appendix 6.3 for more details.

[14] Cobreros et al. (2010) cites Alxatib and Pelletier (2010) and Ripley (2009) for experimental evidence supporting the existence of **borderline contradictions**, cases where speakers prefer to think of an individual

feature of gradable predicates that they have borderline cases. What it is to be a clear case of a scalar predicate is to be in its extension and not a borderline case of it. Thus, the subject of a *NIN* sentence is said to not be a borderline case of its main predicate.

3.2 DelTCS

Here, *DelTCS* is introduced and then classical, tolerant and strict extensions are recast in *Strong Kleene* Logic (*K3*) for the analysis of *NIN* constructions. We employ it for its robust characterization of scalar adjectives and formal definition of borderline cases.

3.2.1 Introduction to DelTCS

DelTCS combines the systems *Delineation Semantics (DelS)* (Klein 1980) and *Tolerant, Classical, Strict (TCS)* (Cobreros et. al 2011).

DelS is a framework that models the context-sensitivity of scalar adjectives. All predicates P have an extension that is evaluated in some comparison class X that is a subset of the domain.[15] Intuitively, an entity that is tall in one context may not be tall in another context. For instance, a wine glass may be tall compared to other glasses one drinks out of. The sentence "Wine glasses are tall," is therefore true within the context of a discussion about the glasses on a dining room table. However, if a human is compared to a wine glass, the wine glass is no longer considered tall. This notion is understood by evaluating an entity for tallness only relative to a certain subset of the domain provided by context. An proposition may be true in one subset of the domain but not another. These subsets are called *comparison classes* and are denoted by Xs.

TCS models the **tolerance**[16] of predicates. A predicate is tolerant with respect to scale Θ if there is some degree of change with respect to Θ that isn't sufficient to affect whether or not the predicate is true of any entity. This is encoded with an indifference relation $\sim_P$, which holds between any two entities that do not differ significantly enough with respect to predicate P to make a difference whether or not P applies to them. *TCS* uses the indifference relation to define three kinds of satisfaction, **Classical**, **Tolerant** and **Strict** satisfaction. An atomic sentence $P(t)$ is:

as both "tall" and "not tall" or neither "tall" nor "not tall" when that individual is in the middle of a scale of tallness. This is the intuition motivating paraconsistent approaches to the semantics of borderline cases such as the one presented here. We say an entity a is a borderline case of a predicate P if both $P(a) = T$ and $\neg P(a) = T$ based on tolerant satisfaction.

[15] See Appendix 6.4 for axioms constraining the behavior of comparison classes.

[16] *TCS* was created in part to deal with the Sorities Paradox. Intuitively, the paradox states that for any tolerant predicate, if there is an entity of which the predicate is clearly true and, for a measurement relevant to the application of the predicate, if there is a quantity of difference that is negligible to the application of the predicate, the predicate is true of all entities.

For instance, "tall" is a tolerant predicate, the Burj Khalifa is a clearly tall building, and a building's being 1 millimeter taller or less tall isn't enough to change whether or not it is "tall"; if the Burj Khalifa is tall, then buildings 1 millimeter shorter are also tall, and buildings 1 millimeter shorter than those buildings are tall by extension. It follows from repeated inferences like this that any building shorter than the Burj Khalifa is tall if the Burj Khalifa is.

The primary application of the indifference relation is to explain how tolerance is possible while avoiding the conclusions of this paradox. This is achieved in part by making the indifference relation possibly non-transitive.

• **classically satisfied** if t is in the classical extension of P, the extension of P determined solely by the language's interpretation function.
• **tolerantly satisfied** if there is some t' such that $t' \sim_P t$ and t' is in the classical extension of P.
• **strictly satisfied** if for all t' such that $t' \sim_P t$, t' is in the classical extension of P.[17]

DelTCS (Burnett 2012, 2013), the system to be used for modeling the truth conditions of *NIN* constructions, essentially takes the *TCS* system and relativizes the the interpretation of adjectives to comparison classes as in *DelS*. The logic was designed to model differences and similarities between different kinds of adjectives, characterizing their differences as differences of context-sensitivity. For instance, **relative adjectives** such as "tall" display properties of vagueness in both their positive and negated forms. An entity cannot be "completely tall" or "completely not tall" in any context. "Tall" is also tolerant in its positive an negative forms: if someone differs from a tall person by 1 mm in height they are also tall, and if they differ from a person who isn't tall by 1 mm in height they are also not tall. On the other hand, **total absolute adjectives**, such as "bald," are possibly tolerant in their negative form. If a person is "not bald" it does not follow that if another differs from him or her by one hair that such a person is "not bald" as well. If the first person only has one hair, the second person could not be described as "not bald" if he or she had one less hair.

3.2.2 DelTCS Fragment

In this section we reformulate the predicate extensions of *DelTCS* in terms of the *K3* system based on Muskens (1995) and Krahmer (1998). Because this project is merely an elucidation of the truth conditions for a *NIN* constructions, many aspects of *DelTCS* go beyond the scope of this project. The definitions of borderline cases for scalar adjectives are what is of paramount importance for the purposes of capturing the truth conditions of *NIN* constructions. We do away with the indifference relation and redefine tolerant, classical and strict extensions in terms of the three-valued system.

K3:
K3 is a partial, three-valued logic. Truth conditions of the elementary connectives in *K3* are provided in FIGURE 2. Each predicate has a **denotation**, a set of entities of which the predicate is true, and an **antidenotation**, a set of entities of which the predicate is false.[18]

The denotation and antidenotation of a predicate do not necessarily exhaust the comparison class in which they are evaluated, and the **gap** of entities that are neither true (T) nor false (F) with respect to the predicate are neither (N).[19]

Changes to *DelTCS*:
In order to simplify our own proposal for the truth conditions of *NIN* constructions, we will define classical satisfaction as satisfaction in *K3*, do away with the indifference relation and redefine tolerant, classical and strict extensions of predicates in terms of *K3*'s partial system.

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[17] Tolerant and strict satisfaction are duals, based on Priest's *Logic of Paradox* (*LP*) and *Strong Kleene* (K3) logic respectively.
[18] We will sometimes represent the denotation of a predicate P as $I^+(P)$ and the antidenotation as $I^-(P)$ as in FIGURE 2
[19] The logic of Muskens (1995) has four truth-values. Three is adequate, however, for the task of defining the tolerant and strict extensions of predicates without the indifference relation.

	$\neg$
T	F
F	T
N	N

$\wedge$	T	F	N
T	T	F	N
F	F	F	F
N	N	F	N

$\vee$	T	F	N
T	T	T	T
F	T	F	N
N	T	N	N

$\rightarrow$	T	F	N
T	T	F	N
F	T	T	T
N	T	N	N

Figure 2: *Truth tables for the logical connectives in* K3. $\neg$ *flips the truth values of its arguments if they are T or F.* $\wedge$ *takes the* MIN *of its arguments while* $\vee$ *takes the* MAX *of its arguments.* $\rightarrow$ *is equivalent to the* MAX *of the negation of its antecedent and the non-negation of its consequent (*$\neg A \vee C$*).*

The classical extension of a predicate is the extension denoted by applying the interpretation function of *K3*. This is roughly the same as its classical extension in Burnett (2012, 2013), as *DelTCS* defines the classical extension of a predicate as that extension denoted by applying the logic's interpretation functions to that predicate. However, our proposal uses two separate interpretation functions I^+ and I^-, which means that the classical denotations and antidenotations are defined separately. The classical extension of predicate P is the set that satisfies $I^+(P)$, and the classical antiextension of P is the set that satisfies $I^-(P)$. As in *DelTCS*, a truth-value gap may exist between these denotations. However, whereas *DelTCS* uses a truth value gap for modeling presupposition failure, the gap is utilized for the purposes of defining borderline cases in the system presented here. Sticking with the analysis of example (6) given in the introduction, we propose that presuppositions do not play a formational role in the basic truth conditions of *NIN* constructions. In the future, it is more specialized accounts of the semantics of *NIN* constructions may provide a framework for more generally modeling presupposition failure in *NIN* constructions.

Whereas the indifference relation is useful for modeling the tolerant predicates that concern *NIN* constructions, it isn't necessary for giving a broad conception of the construction's truth conditions. The indifference relation plays an important role in modeling tolerance, and the basic truth conditions of *NIN* constructions provided here does not necessitate a robust model of tolerance - just a model of borderline cases. Thus, it would complicate the project at hand to specify the truth conditions of *NIN* constructions using an indifference relation. Rather than define strict and tolerant predicate extensions using the indifference relation, we define them in terms of regions of truth in our three-valued system.

Strict and tolerant satisfaction are redefined according to the specifications in FIGURE 3. A predicate is tolerantly true of an entity just in case the entity is either in the denotation of the predicate or in the gap between its denotation and antidenotation. As long as a person is not clearly short, such a person is tolerantly tall. Meanwhile a predicate is strictly true of an entity just in case the entity is in the denotation of the predicate. While this is the same as satisfaction in *K3*, a proposition is strictly false if it is either in the antidenotation of the predicate or the gap. As long as an individual is not strictly tall, they are strictly not tall.

Crucially, the formalization of boundary cases in this framework has not changed from the original definition in *DelTCS*. An entity is still a boundary case of a predicate if the predicate is tolerantly true of the entity when its negation is also tolerantly true of the entity.

Satisfaction:

	Value	
Strict T	P = T	Tolerant T
Strict F	P = N	Tolerant T
Strict F	P = F	Tolerant F

Negation Satisfaction:

	Value	
Strict F	$\neg P$ = T	Tolerant F
Strict F	$\neg P$ = N	Tolerant T
Strict T	$\neg P$ = F	Tolerant T

Figure 3: *Strict and tolerant satisfaction defined in terms of* K3 Logic. *A predicate is strictly true of an entity if the entity is in its denotation, and the negation is strictly true of an entity if that entity is in its antidenotation. Meanwhile, a predicate is tolerantly true of an entity as long as that entity is not in its antidenotation, and its negation is tolerantly true if it isn't in the predicate's denotation. The predicate is both tolerantly true and tolerantly false of the N-valued entities, which are its borderline cases.*

3.3 *NIN* Construction Truth Conditions

The intuition behind the truth conditions of a *NIN* construction is provided here. An entity that is "nothing if not" P is one that is strictly P in *DelTCS* terms. By introducing possible worlds, modal operators, and an accessibility relation R^P_{bd}, we arrive at a precise contribution of "nothing if not" that ensures the subject is in the strict denotation of its main predicate. Motivations for explicating the truth conditions of *NIN* constructions in terms of modal operators is provided in the final subsection.

3.3.1 "Nothing If Not" as Strict Truth

A *NIN* construction is true if its main predicate is true of the subject and the subject is not a borderline case of the main predicate. Within the *DelTCS* framework, where a boundary case of predicate P is an entity that P and $\neg P$ are simultaneously tolerantly true of, for the entity to be "nothing if not" P, P must be *strictly true* of a. Only entities that are strictly P are both in the extension of P and not borderline cases of P.

Although a formula's being true in *K3* and its being strictly true are conflated, this is not the case in logics like *DelTCS*. Partly in order to generalize this proposal to such logics, we will characterize the contribution of "nothing if not" as the introduction of a modal operator evaluated with respect to a special accessibility relation R^P_{bd} which eliminates boundary cases for predicate P. Motivations for using modality are discussed further in section 3.3.3.

3.3.2 Modal Account and R_{bd}

In what follows, we provide an intuitive account of the truth conditions of a *NIN* construction. *NIN* constructions introduce a modal necessity operator evaluated relative to accessibility relation R^P_{bd}, where P is the main predicate of the construction. This account ensures the main predicate modified by "nothing if not" strictly satisfies the subject, as only entities that are strictly true of the predicate are true of the predicate in all possible worlds.

If a is "nothing if not" P, then with respect to accessibility relation R^P_{bd}, P is true of a in all possible worlds. Intuitively, in world w, a may be in the strict denotation of its main predicate. R^P_{bd} is set up such that across possible worlds, entities fluctuate from the gap into of the denotation of P. If an entity is a borderline case of P then it is possibly P and possibly not P. If a is "nothing if not" P, then it is in the strict denotation of P in all possible worlds accessible from R^P_{bd}. FIGURE 4 illustrates how the accessibility relation for such a model works. In world w_0, the actual world, entities in the denotation and antidenotation of the main predicate remain in the denotation or antidenotation respectively across all possible worlds. However, entities from the gap are raised into the denotation of the predicate and lowered into its antidenotation in some possible worlds.

The fixation of some entities within the strict extension of a predicate P across possible worlds provides a set of entities that are "nothing if not" P - the proper denotation for *NIN* constructions.

3.3.3 Why Use Modality At All?

It may seem that the these truth conditions amount to saying that an entity is "nothing if not" P if it is P. After all, if the entity is within the denotation of P in w_0, then it is in the strict denotation of P in all possible worlds and vice versa. However, this analysis may be easily developed into a formal intensional theory. An entity may only be "nothing if not" P according to the beliefs of an individual. The modal component of the logic will play an important role for this next step.

Additionally, whereas a predicate's strict denotation and its denotation in *K3* are the same, this

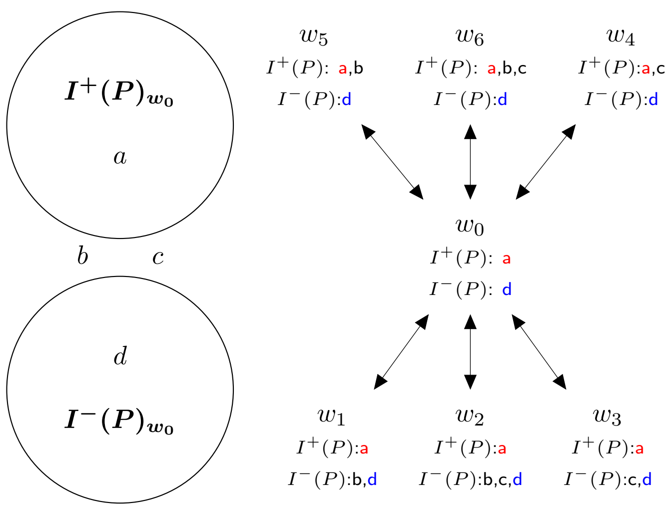

Figure 4: *This illustrates the relationship between the denotation and antidenotation of* P *(left) and* R^P_{bd} *centered at world* w_0 *(right). On the left, each circle represents one of the dentotations of* P *and the lowercase Roman letters inside represent entities. On the right, arrows represent world-accessibility. Only entities in the strict denotation of a predicate (a and f, colored above) remain true and false respectively in all worlds accessible to* w_0*.*

is not the case in logics such as *DelTCS*. Applying the interpretation function to a predicate in *DelTCS* provides the predicate's classical denotation rather than its strict denotation. The modal component of the logic therefore allows the theory to be absorbed into logics with a different criteria for determining the extension of predicates. In many logical systems a predicate may be strictly true of an entity it is necessarily true of by R^P_{bd}, but in many logics it won't be the case that an entity is strictly/clearly true if it is in the positive denotation given by the interpretation function.

These basic truth conditions may also be developed into a compositional theory. Given the existence of an "if" in the construction, a modal analysis is highly preferred for the task of this expansion. More about this is discussed in Section 5.

4 Formal Theory

The formal account of the truth conditions of *NIN* constructions is fleshed out here. First we provide the fragment of *DelTCS* stripped of the indifference relation. Comparison classes are used the same as they are used in *DelTCS*. Rather than defining tolerant and strict extensions of predicates in terms of the indifference relation, a predicate's tolerant extension is the union of its *K3* extension and its truth value gap, while its strict extension is defined as its *K3* extension. Where strict extensions and *K3* extensions come apart is in the definition of "strictly false." A formula is strictly false if its is false in *K3* or if it is in the gap in *K3*.

Following this, *DelTCS* is expanded with possible worlds, modal operators and an accessibility relation R^P_{bd}. R^P_{bd} is defined such that the denotation and antidenotation of P are fixed across possible worlds, though the borderline cases are in the denotation or antidenotation in some possible worlds.

Finally, the formal truth conditions of *NIN* constructions within the framework are provided. An entity a is "nothing if not" P if it is in the denotation of P in all possible worlds accessible from R^P_{bd}. This ensures that it is in the strict denotation of P and is not a borderline case of P. The section is closed with a demonstration of the truth conditions for "The Burj Khalifa is nothing if not tall."

4.0.4 DelTCS Fragment

Here the fragment of *DelTCS* used to formalize the truth conditions of *NIN* constructions is formally introduced. We introduce its vocabulary, syntax, and semantics below.

Vocabulary
• A set of individual constants $a_1, a_2, a_3 \ldots$
• A set of individual variables $x_1, x_2, x_3 \ldots$
• A set of relative adjective predicate constants P_1, P_2, P_3...
• The quantifiers $\forall$ and $\exists$ and connectives $\wedge, \vee, \rightarrow,$ plus parentheses.

Syntax
The set of formulae is defined as follows, where a *term* is either an individual constant or variable:

1) If P is a predicate and t is a term, then $P(t)$ is a formula.
2) If phi and psi are formulae, then $\neg\phi$, $\phi \wedge \psi$, and $\phi \rightarrow \psi$ are formulae.

3) If ϕ is a formula and x is an individual variable, then $\forall x\phi$ and $\exists x\phi$ are formulae.

Semantics

T-model: A t-model is a triple $M = \langle D, I^+, I^- \rangle$, where D is a non-empty domain of individuals and I^+ and I^- are interpretation functions for comparison class X s.t. for each individual constant a_1, $I(a_1) \in D$ and for each $X \subseteq \mathcal{P}(D)$ and predicate P, $I(P)_X \subseteq X$.

$I^+(t) = I^-(t)$ if t is a term, but for predicates P, $I^+(P)$ and $I^-(P)$ must differ: we stipulate that for all P, $I^+(P) \cap I^-(P) = \varnothing$.

Assignment: An assignment for a c-model or a t-model M is a function $g : \{x_n : n \in \mathbb{N}\} \rightarrow D$.

Interpretation: The value $[\![\cdot]\!]$ of any term or formula given interpretations I^+ and I^- for a t-model M on assignment g, is defined as follows:

For all variables x,
•$[\![x]\!]^+_{M,g} = [\![x]\!]^-_{M,g} = g(x)$

For all constants a,
•$[\![a]\!]^+_{M,g} = [\![a]\!]^-_{M,g} = I(a)$

For all predicates P:
•$[\![P]\!]^+_{M,g} = \{x : [\![x]\!] \in I^+(P)\}$
•$[\![P]\!]^-_{M,g} = \{x : [\![x]\!] \in I^-(P)\}$

For all terms t, predicates P and formulae ϕ:[20]
•$[\![P(t)]\!]^+ = T$ iff $[\![t]\!] \in I^+(P)$
•$[\![P(t)]\!]^- = T$ iff $[\![t]\!] \in I^-(P)$

•$[\![\neg\phi]\!]^+ = T$ iff $[\![\phi]\!]^- = T$
•$[\![\neg\phi]\!]^- = T$ iff $[\![\phi]\!]^+ = T$

•$[\![\phi \wedge \psi]\!]^+ = T$ iff $[\![\phi]\!]^+ = T$ and $[\![\psi]\!]^+ = T$
•$[\![\phi \wedge \psi]\!]^- = T$ iff $[\![\phi]\!]^- = T$ or $[\![\psi]\!]^- = T$

•$[\![\phi \vee \psi]\!]^+ = T$ iff $[\![\phi]\!]^+ = T$ or $[\![\psi]\!]^+ = T$
•$[\![\phi \vee \psi]\!]^- = T$ iff $[\![\phi]\!]^- = T$ and $[\![\psi]\!]^- = T$

•$[\![\phi \rightarrow \psi]\!]^+ = T$ iff $[\![\neg\phi]\!]^+ = T$ or $[\![\psi]\!]^+ = T$
•$[\![\phi \rightarrow \psi]\!]^- = T$ iff $[\![\phi]\!]^+ = T$ and $[\![\psi]\!]^- = T$

•$[\![\exists x\phi]\!]^+ = T$ iff there is some assignment h s.t. $g[x]h$ and $[\![\phi]\!]^+_h = T$
•$[\![\exists x\phi]\!]^- = T$ iff for all assignments h s.t. $g[x]h$, $[\![\phi]\!]^-_h = T$

•$[\![\forall x\phi]\!]^+ = T$ iff for all assignments h s.t. $g[x]h$, $[\![\phi]\!]^+_h = T$
•$[\![\forall x\phi]\!]^- = T$ iff there is some assignment h s.t. $g[x]h$ and $[\![\phi]\!]^-_h = T$

[20]Note that the truth conditions of $\neg$, $\wedge$, $\vee$, and $\rightarrow$ match the truth conditions illustrated in FIGURE 2.

where $g[x]h$ means that assignment h is identical to assignment g except at most to the value assigned to x.

Strict and Tolerant Satisfaction for Negation
The tolerant and strict denotations of a predicate may be defined as follows:

- $[\![P]\!]^t_X = \{x : [\![x]\!] \notin [\![P]\!]^-_X\}$
- $[\![P]\!]^s_X = \{x : [\![x]\!] \in [\![P]\!]^+_X\}$

where the superscripts t and s indicate tolerant and strict denotations respectively.

Tolerant Satisfaction: For all t-models M, all $X \subseteq \mathcal{P}(D)$, and all $a_1 \in D$

$$[\![P(a_1)]\!]^t_{M,g,X} = \begin{cases} T & \text{if } [\![a_1]\!]_{M,g} \in [\![P]\!]^t_{M,g,X} \\ F & \text{if } [\![a_1]\!]_{M,g} \in X - [\![P]\!]^t_{M,g,X} \end{cases}$$

$$[\![\neg\phi]\!]^t_{M,g,X} = \begin{cases} T & \text{if } [\![a_1]\!]^s_{M,g} \in X - [\![P]\!]^s_{M,g,X} \\ F & \text{if } [\![\phi]\!]^s_{M,g,X} = T \end{cases}$$

Strict Satisfaction: For all t-models M, all $X \subseteq \mathcal{P}(D)$, and all $a_1 \in D$

$$[\![P(a_1)]\!]^s_{M,g,X} = \begin{cases} T & \text{if } [\![a_1]\!]_{M,g} \in [\![P]\!]^s_{M,g,X} \\ F & \text{if } [\![a_1]\!]_{M,g} \in X - [\![P]\!]^t_{M,g,X} \end{cases}$$

$$[\![\neg\phi]\!]^s_{M,g,X} = \begin{cases} T & \text{if } [\![\phi]\!]^t_{M,g,X} = F \\ F & \text{if } [\![\phi]\!]^t_{M,g,X} = T \end{cases}$$

We say that a_1 is a borderline case of P when *both* $[\![P(a_1)]\!]^t_{M,X}$ and $[\![\neg P(a_1)]\!]^t_{M,X}$ are true.

4.1 Modality in DelTCS

"Nothing if not" introduces at minimum a modal necessity operator. Bringing modality into *DelTCS* allows us to draw a special connection between tolerance and possibility, captured by a new accessibility relation R_{bd}.

4.1.1 DelTCS Expansion

Vocabulary
Possible worlds $w_1, w_2, w_3 \ldots$

Syntax
If ϕ is a formula, then so are $\Box\phi$ and $\Diamond\phi$

Semantics
T(olerant)-model: A t-model is a tuple $M = \langle D, I^+, I^-, W, R_{bd}\rangle$ where
$\langle D, I^+, I^-\rangle$ is a T-model, W is a set of possible worlds, and R_{bd} is a special accessiblity relation $W \times W$ between worlds.

Accessibility Relation:
R_{bd} has the following definition, where P is any predicate and w is any world:

$$R^P_{bd}(w) \quad = \{w' : ([\![P]\!]^+_w \subseteq [\![P]\!]^+_{w'}) \wedge ([\![P]\!]^-_w \subseteq [\![P]\!]^-_{w'})\}$$

subject to the constraint that for any w', $[\![P]\!]^+_{w'} \cap [\![P]\!]^-_w = \varnothing$

A world w' is accessible to w if both the denotation and antidenotation of P in w' are supersets of the denotation and antidenotation of P in w respectively. Thus there are some entities that are in the denotation of P in all possible worlds, though entities in the gap are possibly in the denotation of P.

Interpretation:
The interpretation of modal operators[21] in expanded *DelTCS*:

$$[\![\Box P(t_1)]\!]^+_{M,w,g,X} = \ T \text{ iff for every } w' \in W \text{ s.t. } w\, R^P_{bd}\, w', [\![t_1]\!]_{M,g} \in [\![P]\!]^+_{M,w',g,X}$$
$$[\![\Box P(t_1)]\!]^-_{M,w,g,X} = \ T \text{ iff for some } w' \in W \text{ s.t. } w\, R^P_{bd}\, w', [\![t_1]\!]_{M,g} \in [\![P]\!]^-_{M,w',g,X}$$
$$[\![\Diamond P(t_1)]\!]^+_{M,w,g,X} = \ T \text{ iff for some } w' \in W \text{ s.t. } w\, R^P_{bd}\, w', [\![t_1]\!]_{M,g} \in [\![P]\!]^+_{M,w',g,X}$$
$$[\![\Diamond P(t_1)]\!]^-_{M,w,g,X} = \ T \text{ iff for every } w' \in W \text{ s.t. } w\, R^P_{bd}\, w', [\![t_1]\!]_{M,g} \in [\![P]\!]^-_{M,w',g,X}$$

$$[\![\Box P(t_1)]\!]^{+/-}_{M,w,g,X} =$$
$$[\![\Diamond P(t_1)]\!]^{+/-}_{M,w,g,X} = \ N \text{ iff there is no } x \in D \text{ s.t. } [\![P(x)]\!]^+ = F \text{ and } [\![P(x)]\!]^- = F$$

The modal operators here rule out the possibility of being evaluated with respect to an extension containing no boundary cases (see the last definition above). Though it is not necessary to put this as a restriction in the semantics, it is possible that "nothing if not" constructions can only be evaluated with respect to predicates that have boundary cases. Thus, this analysis makes predictions that are fruitful for testing in the future.

4.2 Truth Conditions for *Nothing if not*

4.2.1 Truth Conditions

A *nothing if not* construction involving subject $a_1 \in D$ and main predicate $P \subseteq D$ in model M for world $w_1 \in W$ and $X \subseteq \mathcal{P}(D)$ has the truth conditions:

$$[\![\Box P(a_1)]\!]^+_{M,w_1,g,X} = \begin{cases} \text{T} & \text{if for every } w' \in W \text{ s.t. } w_1\, R^P_{bd}\, w', \\ & [\![P(a_1)]\!]^+_{M,w',g,X} = T \\ \text{F} & \text{if for some } w' \in W \text{ s.t. } w_1\, R^P_{bd}\, w', \\ & [\![P(a_1)]\!]^-_{M,w',g,X} = T \\ \text{N} & \text{if there is no } x \in D \text{ s.t. } [\![P(x)]\!]^+_{M,w,g,X} \\ & = F \text{ and } [\![P(x)]\!]^-_{M,w,g,X} = F \end{cases}$$

The R^P_{bd} accessibility relation ensures that a_1 is in the extension of P in all possible worlds. This rules it out from being a boundary case, and as a result of our analysis, an entity which is "nothing if not P" is *strictly* P and not a borderline case of it.

4.2.2 Example

The basic truth conditions of

14) "The Burj Khalifa is nothing if not tall."

[21]Tolerant and strict modal operators are defined in Appendix 6.5.

are as follows in world $w_0 \in W$ and $X_0 \subseteq \mathcal{P}(D)$:

$$[\![\Box\text{Tall'(Burj Khalifa')}]\!]^{+}_{M,w_0,g,X_0} =$$

$$\begin{cases} T & \text{if for every } w' \in W \text{ s.t. } w_0\ R^{Tall}_{bd}\ w', [\![\text{Tall'(Burj Khalifa')}]\!]^{+}_{M,w',g,X_0} = T \\ F & \text{if for some } w' \in W \text{ s.t. } w\ R^{Tall}_{bd}\ w', [\![\text{Tall'(Burj Khalifa')}]\!]^{-}_{M,w',g,X_0} = T \\ N & \text{if there is no } x \in D \text{ s.t. } [\![\text{Tall'(x)}]\!]^{+}_{M,w_0,g,X_0} = F \text{ and} \\ & [\![\text{Tall'(x)}]\!]^{-}_{M,w_0,g,X_0} = F \end{cases}$$

If the statement is true, then it follows from the constraints on R^{Tall}_{bd} that the Burj Khalifa is strictly tall in comparison class X_0, as it is in the denotation of Tall in all possible worlds. Since the Burj Khalifa is not a borderline case of tallness when it is strictly tall it follows that it is not a borderline case of tallness. If there were no borderline cases of tallness in X_0, our proposal would suggest that the *NIN* construction would be neither true nor false.

Conclusion:
The basic truth conditions of a *NIN* construction such as "Bob is nothing if not deliberate," is that Bob is deliberate and strictly so - he is not a borderline case of deliberateness. The acceptability study has shown that "nothing if not" is sensitive to the eventive vs. stative nature of the main predicate it combines with and is thus best understood as a modifier of its main predicate. "Nothing if not" introduces a modal necessity operator evaluated with respect to accessibility relation R^{P}_{bd}, the function of which is to eliminate boundary cases. From world w the entities that are "nothing if not" P are those in the denotation of P in w_0. As these entities are in the denotation of P in all possible worlds, it is ensured that they are in the strict denotation of P as well.

Though in some sense this amounts to saying that P is "nothing if not" true of an entity if it is true of the entity, this proposal allows us to more easily take the analysis further in future research. We may be able to use this framework to provide a semantics sensitive to individuals' particular beliefs and perspectives, introducing different accessibility relations. The analysis may also be taken in the compositional direction, and predictions such the prediction that the main predicate modified by "nothing if not" require borderline cases (guaranteed by the definition of R_{bd} given above) may be investigated in future research. This is discussed at greater length in the next section.

5 Future Research

Here we provide insights about possible future research on *NIN* constructions. The proposal introduced in this paper has defined the basic truth conditions for *NIN* constructions, but the construction will necessitate a richer semantics.

First we discuss examples for which non-scalar predicates are the main predicate. Within our current theory, these constructions cannot be given a proper analysis. Either evidence must be shown that these predicates are forced into a scalar interpretation or a generalization of the theory must be undertaken.

We then discuss a relative of *NIN* constructions - the "if not" construction, e.g. "John is happy if not ecstatic." Although these constructions have different meanings, they may have similar uses for their conditional and they may use a common accessibility relation.

This also brings us to the final section on a compositional semantics for *NIN* constructions. Although we have argued that *NIN* constructions are not conditionals, the fact that they are well understood as modalized suggests that they have similarities to conditionals.

5.1 Expansion to Non-Scalar Adjectives

The analysis provided here accounts for the most common cases of *NIN* constructions. However, "nothing if not" may directly precede absolute adjectives as well as non-scalar predicates:

> 15) "Like many of the slum dwellers, the factory owner was a Muslim, although Dharavi is nothing if not **diverse**."[22] (Partial Absolute Adjective)

> 16) "His vision is nothing if not **the American dream of self-making**."[23] (Definite Description)

Our next step will be to generalize our theory to account for these constructions. As it stands, R_{bd} may be too narrow on its own, since predicates that are not vague do not have borderline cases. Absolute adjectives such as "diverse" and "bald" may have a closed scale structure, and the interpretation that "nothing if not" forces on these adjectives, whether or not they must reach the top or bottom of their respective scales, is an open question.

Future research on this question may take one of two forms.

It could be the case that scalar adjectives are a special case of a more generic proper semantic analysis for the construction. In this case, there may be multiple accessibility relations at play, or the accessibility relation R_{bd} could fall out of a more generic accessibility relation.

It's also possible that "nothing if not" forces the predicate in consideration into gradability. In this case, the analysis provided here would suffice, but additional work would have to be done explaining the semantics of this phenomenon.

In order to test these hypotheses, we may conduct an experimental investigation of the suitability of various kinds of adjectives (relative, absolute, non-scalar) for *NIN* constructions. If the lack of tolerance for borderline cases is the primary feature of the semantics of *NIN* constructions as we have suggested, then adjectives that lack borderline cases, such as non-scalar adjectives, should be measurably less-suited for the construction.

5.2 Expansion to Related "If Not" Constructions

NIN constructions may have a close relative in examples such as the following:

> 17) "It is very difficult, *if not* impossible, to envision a moral use of nuclear weapons."[24]

Such constructions suggest a similar analysis focused on gradable adjectives. Although *NIN* constructions require the strict truth of the predicate, "if not" constructions seem to require something weaker.

[22] Lancaster, John. *Next Stop, Squalor.* Smithsonian. Vol. 37, Iss. 12; pg. 96, 9 pgs. 2007 (March).
[23] Curnutt, Kirk. *Direct addresses, narrative authority, and gender in Rebecca Harding Davis's 'Life in the Iron...'.* Style. Summer94, Vol. 28 Issue 2, p146, 23p. 1994 (Summer).
[24] Anonymous, *you may be right: letters*. U.S. Catholic. October 2011.

Intuitively, (17) seems to mean that it is at least difficult to envision a moral use of nuclear weapons, but it may be impossible as well. Whereas *NIN* constructions may indicate that the main predicate is strictly true of the subject, the matrix clause predicate in these constructions may be necessarily true of the subject while the predicate in the *if* clause is possibly true of the subject. A similar accessibility relation to R_{bd} may be used to model their truth conditions.

5.3 Compositionality

Questions remain about the semantic compositionality of *NIN* constructions. We have here dismissed that these constructions are conditional constructions despite their having an *if* clause. Yet it is possible that some remnants of the conditional flavor exist, e.g. the modal.

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[8] Kate Kearns. *Semantics.* St. Martin's, New York. 2000.

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6 Appendix

6.1 Variations of "nothing if not"

> A1: "Where do they get their satisfaction? *Nowhere if not* in the advancement of learning itself."[25]

[25] Medawar, Peter B. Advice to a Young Scientist. *Bulletin of the Atomic Scientists*. April 1981. *Google Books* Web. 10 March 2013.

A2: "...the Earth can be *nowhere if not* in the centre of the Universe."[26] - Melanchthon (1497-1560)

A3: "Yelp *isn't anything if not* helpful."[27]

A4: "But the dynamic surrounding the mainstream adoption of technologies - and MS Word *isn't anything if not* mainstream - still fascinates me."[28]

A5: "Agents can be totally replaced by each other and their subjectivity has *no place if not* as a list of data."[29]

A6: "Honey, I *ain't nothing if not* that."[30]

6.2 Additional Examples of Items from Experiment 1

Target Items:

Item #	Context	Item	Properties
Target Item 3	"John completely dedicates himself his studies. He is constantly working on his research."	"John is nothing if not a hard-working student."	True, Late, Nin, Be
Target Item 10	"Leah always takes her siblings at their word. She believes they will never let her down."	"If not a trusting sibling, Leah is nothing."	True, Early, Nin, Be
Target Item 22	"Rita refuses to do what her parents tell her to. She rebels against them whenever possible."	"Rita does nothing if she doesn't obey her parents."	False, Late, Cond, Do
Target Item 25	"Jared throws parties every night in his undergraduate dorm. He doesn't go to his lectures because he doesn't know what his classes are."	"If not study for his undergraduate classes, Jared does nothing."	False, Early, Nin, Do

Fillers:

[26] White, Andrew D. Chapter III, Section II, The Heliocentric Theory. *A History of the Warfare of Science and Theology in Christendom*. New York. D Appleton 1898. Web. 17 March 2013.

[27] USPS. *Yelp.com*. 14 March 2010. Web. 10 March 2013. Comment by Michelle J. from Cambridge MA.

[28] Maynard, Andrew. Re: Why I Don't Believe in Technology Innovation. Web log comment. *2020 Science*. Andrew Maynard 01 Nov. 2010. Web. 10 March 2013.

[29] Palanto, Roberta. BEYOND RATIONALITY: IMAGES AS A GUIDELINE TO CHOICE. (2003) *Universita Degli Studi di Torino*. Web. 11 March 2013.

[30] Walker, Persia. *Black orchid blues*. Brooklyn, NY: Akashie Books. 2011.

Item #	Context	Item	Properties
Filler 5	"Clay is on good terms with his brother. They communicate often."	"If nothing else, Clay and his brother need counseling."	False
Filler 11	"It's hard to say if Tina is a drug addict. Everyone suspects it, but no one has any proof."	"Lots of people are right about Tina if evidence is found that she is a drug addict."	True
Filler 12	"This party is boring without Abe. There's no point in having a party if Abe doesn't come."	"This party is nothing without Abe."	True
Filler 28	"Abigail is sunning on the beach. It's hard to tell whether or not she is awake."	"What Abigail said was absolutely appalling."	Bad in Context
Filler 35	"Colin finishes everything at the last minute. It is amazing that he has not failed at anything yet."	"Colin has been saved by all the bells."	Bad as Item

6.3 COCA Study

The following are results from a survey of the kinds of main predicates "nothing if not" may modify. The survey was conducted over 382 examples based on the search "nothing if not *". 2 examples contained the string "nothing if not" but were not *NIN* constructions based on their patterns of inference. The different categories of annotation are described below.

Construction Type	$\boldsymbol{NP}$	$\boldsymbol{NP}_{\text{adj-mod}}$	$\boldsymbol{Adj}_{\text{rel}}$	$\boldsymbol{Adj}_{\text{abs}}$	$\boldsymbol{DD}$	$\boldsymbol{ID}$	Other
# Occurrences	33	23	255	3	5	33	28
% Occurrences	8.68	6.05	67.11	0.79	1.32	8.68	7.37

$\boldsymbol{NP}$:

NP refers to a predicate that is syntactically an NP.

e.g. "So-called because any trial mandated by an immoral law is nothing if not a lynching." (Morello, Carol. *Kevorkian sees trial as chance to take final stand.* USA Today. NEWS. 1998.)

$\boldsymbol{NP}_{\text{adj-mod}}$:

$NP_{\text{adj-mod}}$ refers to NPs modified syntactically by a scalar predicate.

e.g. "Kumar is nothing if not a shrewd judge of targeted companies." (Welles, Edwardo O. *Bootstrapping for billions. (cover story)* Inc. Vol. 16 Issue 9, p78, 8p, 8c. 1995 (Sep).)

$\boldsymbol{Adj}_{\text{rel}}$:

Adj_{rel} refers to a relative adjective predicate.

e.g. "And I am nothing if not prudent." (Hettinger, Jack. *Keeping the Faith.* Arkansas

Review: A Journal of Delta Studies. 1994, Vol. 26 Issue 1-4, p296, 16p.)

$\boldsymbol{Adj}_{\text{abs}}$:

Adj_{abs} refers to an absolute adjective predicate.

e.g. "His voice, a rolling bass with a slight Southern twang, is nothing if not smooth." (Wertheim, Jon L. *OUTSIDE LOOKING IN*. Sports Illustrated. Vol. 101, Iss. 21; pg. 64, 9 pgs. 2004 (Nov).)

$\boldsymbol{DD}$:

DD refers to a definite description.

e.g. "As a complete entity, Rimas sacras is nothing if not the chronicle of a return ..." (Grieve, Patricia E. *Point and counterpoint in Lope de Vega's Rimas and Rimas sacras.* Hispanic Review. Autumn1992, Vol. 60 Issue 4, p413, 22p.)

$\boldsymbol{ID}$:

ID refers to an indefinite description.

e.g. "Theresa, the 'idle' woman of whom Foucault speaks, is nothing if not a walking sign of the sexualized body." (Thorne, Kirsten A. *The revolution that wasn't: Sexual and political decay in Marse's Ultimas Tardes con Teresa.* Hispanic Review. Winter1997, Vol. 65 Issue 1, p93, 14p.)

Other:

Other refers to predicates that do not fit nicely into the above categories.

e.g. "That is why the columnist Al Hunt asserts, inanely, that majority counsel David Schippers - who does nothing if not exude moral and legal authority - lacks the gravitas of a John Doar (the chief Watergate counsel)." (Nordlinger, Jay. *Watergate Babies.* National Review. Vol. 50 Issue 25, p30-32, 3p, 1 cartoon, 2bw. 1998 (Dec31).)

6.4 Axioms of Comparison Classes

For all models M, all $a_1, a_2 \in D$ such that $a_1 \in [\![P]\!]_{X,M}$ and $a_2 \notin [\![P]\!]_{X,M}$,

1) *No Reversal*: There is no $X' \subseteq D$ such that $a_2 \in [\![P]\!]_{X',M}$ and $a_1 \notin [\![P]\!]_{X',M}$.

2) *Upward Difference*: For all X', if $X \subseteq X'$, then there is some $a_3, a_4 : a_3 \in [\![P]\!]_{X',M}$ and $a_4 \notin [\![P]\!]_{X',M}$.

3) *Downward Difference*: For all X', if $X' \subseteq X$ and $a_1, a_2 \in X'$ then there is some $a_3, a_4 : a_3 \in [\![P]\!]_{X',M}$ and $a_4 \notin [\![P]\!]_{X',M}$

6.5 Satisfaction of Tolerant and Strict Modal Operators

$$[\![\Box\phi]\!]^t_{M,w,g,X} = \begin{cases} T & \text{if for every } w' \in W \text{ s.t. } w\ R_{bd}\ w', [\![\phi]\!]^t_{M,w',g,X} = T \\ F & \text{if for some } w' \in W \text{ s.t. } w\ R_{bd}\ w', [\![\phi]\!]^t_{M,w',g,X} = F \\ N & otherwise \end{cases}$$

$$[\![\Diamond\phi]\!]^t_{M,w,g,X} = \begin{cases} T & \text{if for some } w' \in W \text{ s.t. } w\ R_{bd}\ w', [\![\phi]\!]^t_{M,w',g,X} = T \\ F & \text{if for every } w' \in W \text{ s.t. } w\ R_{bd}\ w', [\![\phi]\!]^t_{M,w',g,X} = F \\ N & otherwise \end{cases}$$

$$[\![\Box\phi]\!]^s_{M,w,g,X} = \begin{cases} T & \text{if for every } w' \in W \text{ s.t. } w\ R_{bd}\ w', [\![\phi]\!]^s_{M,w',g,X} = T \\ F & \text{if for some } w' \in W \text{ s.t. } w\ R_{bd}\ w', [\![\phi]\!]^s_{M,w',g,X} = F \\ N & otherwise \end{cases}$$

$$[\![\Diamond\phi]\!]^s_{M,w,g,X} = \begin{cases} T & \text{if for some } w' \in W \text{ s.t. } w\ R_{bd}\ w', [\![\phi]\!]^s_{M,w',g,X} = T \\ F & \text{if for every } w' \in W \text{ s.t. } w\ R_{bd}\ w', [\![\phi]\!]^s_{M,w',g,X} = F \\ N & otherwise \end{cases}$$