Chimerical conditionals[*]

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Abstract

This paper introduces and analyzes *chimerical conditionals*, a class of conditionals that are ambiguous between so called 'biscuit' and hypothetical conditional readings. First, an analysis of the biscuit / hypothetical distinction is developed which draws on the pragmatic account of Franke (2009) and pins the distinction on the presence of a special kind of pragmatic presupposition, where what is presupposed is a structural constraint on the common ground. Building on this analysis, chimericity is then showed to derive from a systematic ambiguity of a definite and usually implicit argument in the consequent of chimerical conditionals, between a rigid designator and an individual concept reading. This ambiguity is argued to arise from the different ways in which the common ground can satisfy the familiarity presuppositions associated with the definite argument.

1 Introduction

The sentences in (1) exemplify the well known contrast between two kinds of conditionals, hypothetical conditionals (1-a),[1] and "biscuit" or "non conditional" conditionals (1-b) (Austin 1956; Geis and Lycan 1993; DeRose and Grandy 1999; Siegel 2006, *inter alia*).

(1)   a.   There is beer in the fridge if John remembered to go shopping.
        b.   There is beer in the fridge if you're thirsty.

Intuitively, hypothetical conditionals express a condition, whereas biscuit conditionals do not. In hypothetical conditionals, the truth of the consequent is felt to depend on that of the antecedent, due to a causal or epistemic connection between the situation described by the latter and the one described by the former. In biscuit conditionals, the truth of the antecedent and that of the consequent are felt to have nothing to do with each other. As DeRose and Grandy (1999) put it, upon hearing (1-b), one cannot seriously ask what would be the case if the antecedent were false.

As pointed out already by Austin, biscuit and hypothetical conditionals differ in their inferential profile. Specifically, biscuit conditionals imply the truth of the consequent, and hypotheticals do not. For example, an utterance of (1-b) implies that there is, indeed, beer in the fridge, whereas an utterance of (1-a) does not. Furthermore, this implication of (1-a) is not cancelable, as evidenced by the oddity of (2).

(2)   #If you're thirsty, there is beer in the fridge, though there might not be any beer there.

By the same token, biscuit conditionals imply an unconditional, so that (1-b) implies (3).

(3)   Whether you are thirsty or not, there is beer in the fridge.

An account of the biscuit / hypothetical distinction should characterize the intuitive difference between the two kinds of conditional in a way that explains their differential inferential behavior, ideally within on a uniform semantic theory of conditionals.

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[1]Often referred to in the literature as indicative conditionals. The term *indicative* evokes mood, but the contrast at hand is independent of mood, as has been observed recently by Franke (2009), Swanson (2011) and in unpublished work by Jennifer Rau.

This paper introduces and analyzes a class of conditionals that is pre-theoretically puzzling given the biscuit / hypothetical distinction, because its members seem to belong to both categories at the same time. To exemplify, consider the scenario in (4), henceforth referred to as the heist scenario.

> **The heist scenario**: You are planning a heist to steal the scroll of the book of Isaiah from the British Museum. You turn to an expert who knows the operation of the museum well, and ask for her advice. She tells you:
>
> (4)   If you enter the museum from the south, there are no guards.

In this context, is (4) a biscuit or a hypothetical conditional? Here there are two contrasting intuitions.[2] On the one hand, (4) seems to be a hypothetical conditional. There is certainly a sense in which (4) expresses a condition, a dependency between antecedent and consequent: whether or not the entrance you choose to enter through is guarded depends on which entrance you choose to enter through. Evoking DeRose and Grandy's informal test, one can very reasonably ask the expert: *and what if I don't enter from the south, but from the north? Are there guards then?* On the other hand, (4) also seems to be a biscuit conditional, since the distribution of guards at museum entrances is not dependent on what you do. Your (not) entering the museum cannot bring about the presence or absence of guards at any entrance. It seems pointless to ask: *and what if I decide not to enter? Do guards all of a sudden appear?*

Corresponding to this conflict of intuitions, there are conflicting judgments about the inferential behavior of (4). Biscuit conditionals imply their consequent, and hypothetical conditionals do not. Does (4) imply its consequent, i.e. does it imply that there are no guards? This question cannot be answered definitely, because it is not clear what exactly is being asked. More precisely, the consequent, (5), does not express a stable proposition, but rather different propositions in different contexts (as shown in detail later on).

(5)   There are no guards.

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[2]In informally polling native speakers of English, I have found that many initially have a strong preference for one intuition over the other. All seem to adopt both upon brief reflection.

In the heist scenario, however, the expert's answer (4) implies (6).

(6)   There are no guards at the south entrance.

The question then arises how (4) comes to imply (6). An intuitive answer is that, for some reason to be elaborated, in the context of the conditional, there sentence in(5) expresses the proposition expressed by (6), making (4) paraphrasable as (7).

(7)   If you enter the museum from the south, there are no guards at the south entrance.

Since (7) is a straightforward biscuit conditional, it is unsurprising that it implies its consequent.

However, this answer is unsatisfactory because (4) is not a straightforward biscuit conditional. In fact, the hypothetical reading of (4) does not involve the proposition expressed by (6) at all. On that reading, (4) does not convey that whether or not there are guards at the south entrance depends on where you enter, but rather that whether or not there are guards at your entry point does. The interesting fact is that (4) implies (6) also on its hypothetical reading. That is, even on the intuition that, by uttering (4), the expert is communicating important information about the conditions that a successful heist is contingent on, she is still committing herself to there being guards at the south entrance. The task, then, is to explain why and how it is that an utterance of (4) in the heist scenario commits the speaker to (6) on both the biscuit and the hypothetical reading.

This paper develops an analysis of chimericity which accounts for the observations above. Building on an account of the biscuit / hypothetical distinction inspired by the proposal of Franke (2007, 2009) and in which biscuit readings of conditionals arise when the antecedent and consequent are pragmatically presupposed to be independent (in a specific sense), I trace chimericity to the ambiguity of a possibly implicit definite argument in chimerical consequents between a rigid designator interpretation and an individual concept one. The different interpretations, and the conditions under which they are available, are shown to be determined by properties of the input context, conceived of as a Stalnakerian common ground, and assuming a Heimian familiarity theory of definiteness. The inferential behavior of chimericals just described falls out automatically from the analysis. The account of the biscuit / hypothetical distinction I propose relies crucially

on identifying issues, in the sense of Hulstijn (1997), associated with the antecedent and consequent of a conditional, as well as on an extension of the notion of pragmatic presupposition, to include structural constraints on output common grounds. However, the analysis of chimericity is not dependent on this approach to the biscuit / hypothetical distinction being correct. All it depends on is the reality of the aforementioned semantic ambiguity in chimerical consequents.

The rest of the paper is organized as follows. §2 discusses in some more detail the differences between hypothetical, biscuit, and chimerical conditionals. §3 introduces the dynamic framework assumed in the rest of the paper. §4 presents the proposed analysis of the biscuit /hypothetical distinction. §5 lays out the proposed analysis of chimericity, and §6 draws some general conclusions and situates the analysis within the broader context of the division of labor between semantics and pragmatics.

2   Hypotheses, biscuits, and chimeras

Austin (1956) and DeRose and Grandy (1999) point out that whether a given conditional is read as a biscuit or a hypothetical conditional depends on pragmatic background assumptions. Given the right assumptions, any biscuit conditional can be read as hypothetical. For example, consider again (1-b) above, repeated in (8).

(8)   There is beer in the fridge if you're thirsty.

In normal contexts, (8) is an uncontroversial biscuit conditional. This is because world knowledge tells us that a person's internal states, e.g. their thirst, do not interact causally with the material world. By being thirsty, one cannot bring objects into existence or change their location. Similarly, learning that a person is hungry does not, in and of itself, reveal anything about the existence and whereabouts of material objects. In other words, world knowledge by default rules out a causal or epistemic connection between antecedent and consequent in (8). Nevertheless, one can quite easily imagine specific scenarios overriding this default, making the relevant causal and/or epistemic connection possible. For example, imagine that technology has advanced so that a sensor can be implanted in a person's brain which can recognize her internal mental states and communicate them to various people and devices. In this science fictional scenario, (8) could be used by

the speaker to inform the hearer that her thirst causally triggers the presence of beer in the fridge. Similarly, contexts can be constructed in which an epistemic connection between the addressee's thirst and the presence of beer in the fridge becomes more plausible.

Thus, background assumptions based on world knowledge play an important role in determining what reading is available for a particular conditional sentence, and a theory of the biscuit / hypothetical distinction should explain what exactly this role is. However, this does not mean that the distinction is in any sense vague or imprecise. In any given context in which the background assumptions are fixed, the distinction is sharp (chimerical conditionals notwithstanding, of course). For example, given our current world knowledge, there is a clear and sharp intuition that (8) is a biscuit conditional, and (1-a) is a hypothetical one. This intuition is manifested in the inferential behavior of the two sentences, behavior which is identifiable independently of utterance-specific pragmatic considerations such as speaker intentions and strategic conversational reasoning. The fact that (8) implies its consequent and that (1-a) does not is thus not a matter of particularized conversational implicature, but rather of something more general or conventional. I argue below that the inferential profiles of hypothetical and biscuit conditionals are determined by the presence or absence of a pragmatic presupposition. It is the presence or absence of the relevant presupposition which is determined by world knowledge based background assumptions.

Chimerical conditionals are interesting because they defy the generalization just stated. Their chimericity, i.e. the contrasting intuitions described above, persists even against fixed background assumptions. Consider again (4), repeated in (9).

(9)   If you enter the museum from the south, there are no guards.

Suppose that the background assumptions are fixed so that, as would normally be the case, the distribution of guards at the museum's entrances was determined in a normal way based on security considerations, and that your entering the museum cannot causally affect the existence and location of guards. There are still two contrasting intuitions about (9), a *hypothetical* intuition and a *biscuit* one. According to the hypothetical intuition, whether there are guards depends on where you enter, quite independently of any assumptions about causality or epistemology. If you enter from a guarded entrance, it will be true that there are guards there, and if you enter from

an unguarded one, it will not. According to the contrasting biscuit intuition, (9) is a biscuit conditional, precisely because the background assumptions guarantee that if an entrance is guarded, there are guards there whether or not you enter. The two intuitions can be brought out more clearly by paraphrasing the consequent of (9). The paraphrase in (10) clearly brings out the hypothetical reading, and the one in (11) the biscuit one. Thus, with chimerical conditionals, fixing background assumptions does not determine a hypothetical or biscuit reading as it generally does for other conditionals.

(10)   If you enter from the south, there are no guards where you enter.

(11)   If you enter from the south, there are no guards there.

The sentences in (12) provide more examples of chimerical conditionals.

(12)   a.   If you go to Barcelona, I know a local tailor.
        b.   There's a bench if we go a bit further.
        c.   If you like skying, there are many options in Canada.

To see the chimericity of these examples clearly, consider for example how the biscuit and hypothetical intuitions can be reproduced for (12-a). The hypothetical intuition is that, depending on where you choose to go, I may or may not know a tailor local to that location. If you go to Paris instead of Barcelona, for example, I might not know any local tailors there. This intuition is forced by the paraphrase in (13-a). The biscuit intuition is that who I know does not depend on where you go. If you end up not going to Barcelona, that will not end my acquaintance with any locals I know there. This intuition is forced by the paraphrase in (13-b).

(13)   a.   If you go to Barcelona, I know a tailor local to where you are going.
        b.   If you go to Barcelona, I know a local tailor there.

The sentences in (12) share with (9) the property of the consequent described earlier, namely that it does not express a determinate proposition. It is easy to show that e.g. (12-a) shows the same inferential behavior as (9). Thus, (12-a) does not imply (14) simpliciter.

(14)   I know a local tailor.

On its biscuit reading, the consequent of (12-a) is interpreted as (15), which is also implied by the conditional on both readings.

(15)   I know a local tailor in Barcelona.

On the hypothetical reading, the consequent of (12-a) is interpreted as (16), and (12-a) is on this reading hypothetical precisely because it does not imply the truth of this sentence.

(16)   I know a local tailor where you're going.

The same can be said about the other examples in (12).

The examples cited so far all involve an implicit argument in the consequent. In (4) the implicit argument is, intuitively, the location at which there are no guards. In (12-a), it is the location which is the argument of the lexical predicate *local*. In (12-b), it is the location said to contain a bench, and in (12-c) it is the argument of *options*, the activity for which there are options in Canada. (12-b) and (12-c) are naturally occurring sentences and the others are constructed. It is easiest to construct chimerical examples using implicit arguments, but this is not a necessary feature of such sentences. The implicit arguments can often be made explicit, as in (17), though the result can be somewhat stilted in comparison. More natural sounding examples containing an overt definite description can also be constructed, as in (18).

(17)   a.   If you enter the museum from the south, there are guards at *your entry point*.
        b.   If you go to Barcelona, I know a tailor local to *your destination*.
        c.   If you like skiing, there are many options for pursuing *your interest* in Canada.
        d.   If we go a bit further, there is a bench at *our location*.

(18)   If you're in Turkey, I know places to stay in the capital.

The crucial feature is the interpretational possibilities that implicit arguments share with definite descriptions. As discussed extensively in §5, the property that descriptions and implicit arguments share, and which is found in the consequent of all chimerical conditionals, is having familiarity presuppositions in the sense of Heim (1982). Such presuppositions can be satisfied by context in various ways, including by accommodation, giving rise to dif-

ferent interpretations for the definite argument, implicit or not, that they are associated with. My main claim about chimericity is that it arises from this variability in the interpretation of expressions carrying definite presuppositions. In particular, from an ambiguity between rigid designator and individual concept interpretations.

That definite presuppositions are necessary for generating chimericity is manifest also in the patterns of paraphrase pointed out in (13) above. In (13-b), the implicit argument in the consequent is replaced by a locative pronoun, and the sentence is unambiguously a biscuit conditional. This is expected in light of an observation due to Condoravdi and Gawron (1996), namely that pronouns, unlike definite descriptions and implicit arguments, must refer back to a linguistic antecedent when one is present. Condoravdi and Gawron demonstrate the by the pattern in (19). While (19-b) can be interpreted as saying that everyone who bet on the Superbowl won their bet, (19-c) cannot.[3]

(19) a. Everyone who bet on the Superbowl won the bet.
      b. Everyone who be on the Superbowl won.
      c. Everyone who bet on the Superbowl won it.

Since pronouns must anchor to a linguistic antecedent, the paraphrase in (13-b) cannot receive a chimierical interpretation. The pronoun *there* must refer back to the linguistically introduced antecedent *Barcelona*, rendering the consequent unambiguously equivalent to (15), and forcing the biscuit intuition. The implicit argument in (4), in contrast, is not forced to anchor to *Barcelona*, and can anchor instead to an antecedent implied or accommodated in the context. How this gives rise to a non-rigid, individual concept interpretation is explained in §5.

3 Conditionals in a dynamic setting

Before turning to the analysis of the biscuit / hypothetical distinction, this section briefly presents the dynamic framework used throughout the rest of the paper. This is a standard framework, similar to Heim's (1982) file change semantics, and relying on the formulation in Dekker (1993). The framework is introduced somewhat informally and only in the amount of detail

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[3]Though see Pedersen (2011) for a dissenting view on this issue.

required for the exposition of the proposed analyses of biscuit conditionals and chimericity. Furthermore, no systematic and compositional translation procedure associating natural language expressions with dynamic meanings is given here. More extensive presentations of this and similar systems can be found in Heim (1982), Dekker (1993), Beaver (2001), *inter alia*.

In dynamic semantics, sentences are interpreted as functions from contexts to contexts. A context is understood as a body of information, for example the information taken to be common ground between interlocutors, or the information available to an agent. A context encodes information about the discourse referents defined as available for discussion, and factual information about what reality is taken to be like. For example, a context can provide information about two discourse referents, x and y, and say that x is a flower and y is a bee and y is sitting on x.

A model M be a pair $\langle D, W \rangle$, where W is a non-empty set of worlds and D is a non-empty set of individuals. A context c is a set of *possibilities*. A possibility i is a pair $\langle w, f \rangle$, where w is a world and f is an assignment function, a function mapping discourse referents, represented as object language variables taken from a set of variables V, to individuals in D. The domain $dom(f)$ of an assignment function f is the subset of variables in V to which it assigns individuals. The domain of a possibility i is simply the domain of its assignment function, $dom(f_i)$. Within a context, all the possibilities have the same domain, so it is possible to talk of the domain of a context, $dom(c)$, which is simply the domain shared by all the possibilities in c.

The meaning of a sentence is its *context change potential* (CCP), the way in which it can update a context, i.e. add information to it. There are two ways in which a sentence can add information to a context. First, it can introduce new discourse referents into the domain of the context. Second, it can add information about what is the case, including information about the values of defined discourse referents. Increasing the domain of a context with a new variable is called domain extension.

(20)   **Domain extension**
        For any possibility i, and element $d \in D$, $i[x/d] = \langle w_i, f_i \cup \langle x, d \rangle \rangle$. The extension of c with x, $c[x]$, is the set of all possibilities $i[x/d]$ such that $i \in c$ and $d \in D$

$$c[x] = \{i[x/d] : i \in c \ \& \ d \in D\}$$

The addition of factual information about what the world might be like,

including information about the values of variables already in the domain of the context, is modeled as loss of possibilities. Those possibilities in the input context that do not verify the information conveyed by the sentence are lost. The possibilities that are not lost are said to survive. A possibility i that is part of an input context c survives in an (output) context c' if and only if there is a possibility in c that is the same as i except for, possibly, having a larger domain. An entire input context survives in an output context if and only if all the possibilities in the input context survive in the output context.

(21)   **Survival**
        If c and c' are contexts, and i a possibility in c, then

        (i) i survives in c', $i \prec c'$, iff $\exists j \in c' : w_i = w_j$ & $f_i \subseteq f_j$.

        (ii) $c \prec c'$ iff $\forall i \in c : i \prec c'$.

The CCP of a sentence ϕ, written $c + [\phi]$, is the result of updating a context c with ϕ. In describing CCPs, I use English expressions instead of translating them into a logical language. The intended interpretations of expressions are relative to possibilities. For example, the CCP of the sentence in (22-a) is written as (22-b).

(22)   a.   John arrived.
        b. $c + [\text{John arrived}] = \{i \in c | \text{John}^i \in \text{arrived}^i\}$

(22-b) says that updating a context c with the sentence (22-a) retains those possibilities i in c such that the interpretation of *John* relative to i is a member of the interpretation of *arrived* relative to i. As usual, the interpretation of individual terms such as proper names and variables relative to a possibility is determined by the assignment function of the possibility, whereas the interpretation of predicate symbols is determined by the world of the possibility.

Most important for current purposes is the interpretation of sentences containing expressions that introduce new discourse referents, such as indefinites, and the interpretation of conditionals. The interpretation of indefinites makes use of extension as defined above. An example is given in (23).

(23)   a.   A man^x arrived.
        b. $c + [\text{a man}^x \text{ arrived}] = \{i \in c[x] | x^i \in \text{man}^i$ & $x^i \in \text{arrived}^i\}$ if $x \notin dom(c)$, else undefined.

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(23) says that updating a context with the sentence in (23-a) extends the domain of c with the variable x, and retains all and only the possibilities in the extension of c with x in which x is a man who arrived. An important aspect of the system, which plays a crucial role in the analysis of chimericity below, is the partiality of CCPs. The CCP in (23-b) is only defined for input contexts that do not already contain x in their domain.

An intuitive picture of the information carried by a conditional is that it expresses that assuming the antecedent licenses inferring the consequent. Reflecting this intuition, the CCP of a conditional is in (24).

(24) $c + [\text{if } \phi, \psi] = \{i \in c | i \not< c + [\phi] \vee i < c + [\phi] + [\psi]\}$

Updating a context with a conditional eliminates those possibilities that survive in the context c' that results from updating c with the antecedent, but do not survive in updating c' with the consequent.[4]

Finally, it is useful to define the notion of *support*. A context c is said to support ϕ, $c \vDash \phi$, if and only if no possibilities in c are lost in an update with ϕ. Partial resolution is defined in (26).

(25)   **Support**: $c \vDash \phi$ iff $\exists c' : c' = c + [\phi]$ and $c < c'$

This much is sufficient to introduce my analysis of the biscuit/hypothetical distinction and of chimericity.

4   An account of the biscuit / hypothetical distinction

Various theories of the biscuit/hypothetical distinction have been proposed in the literature. The analysis I present here is based on the pragmatic approach proposed in Franke (2007, 2009). I do not attempt here to argue for Franke's approach against prominent existing alternatives, such as DeRose and Grandy (1999), Siegel (2006) or Ebert et al. (2008).[5] I adopt Franke's

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[4]For a more thorough discussion of implication in dynamic semantics see Dekker (1993).

[5] Discussion can be found in Franke 2009. Here I wish to point out only that one objection against DeRose and Grandy's conditional assertion analysis, raised by Ebert et al. (2008) and repeated by Franke, is not valid. On the latter analysis, conditionals assert their consequent on the condition that the antecedent is true. Ebert et al. (2008) object that in examples like (i), the consequent is asserted regardless of whether the

approach because I find it more appealing than the alternatives, and because it can easily form the basis of an analysis of chimericity that is couched in a uniform semantics for conditionals. The latter analysis, however, does not depend on adopting Franke's approach. Chimericity is a consequence of the semantics of chimerical consequents, and it is possible that other approaches to the biscuit / hypothetical distinction can be used to account for chimericity. Exploring whether they can do so and how, however, involves tackling complicated issues that are tangential to the goal of the paper. For example, extending DeRose and Grandy's analysis would require discussing how the notion of conditional assertion, and more generally conditional speech acts, should be formalized, and how it might interact with a theory of definite presuppositions, a far from trivial task. Franke's analysis, in contrast, is couched in a familiar and well understood dynamic semantics.

The intuitive idea behind Franke's proposal is that biscuit conditionals are ones whose antecedent and consequent are taken to be causally and epistemically independent of each other. Two propositions are independent of each other when learning the truth (or falsity) of the first, if not already known, does not change the agent's beliefs about the second. The assumption of independence together with some pragmatic reasoning leads to an *unconditional* meaning, i.e. to the entailment of the consequent. Specifically, reasoning on part of the hearer about the interaction between what the speaker says in uttering a conditional and what she is presumed to believe, namely the independence of the antecedent and consequent, leads inevitably to the conclusion that she takes the consequent to be true.

I adopt this intuition, but propose two modifications to Franke's specific proposal. The first is to define independence not as a relation between propositions, but between *issues*, defined as sets of context change potentials, expressed as formulae in a dynamic language. This modification is required

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antecedent is true or not.

(i)   If you're not going to watch the movie, the hero dies.

They point out that a speaker who utters (i) has spoiled the movie regardless of the truth of the antecedent. However, this does not show that the consequent of (i) is asserted. All it shows is that the information in the consequent is conveyed regardless of the truth of the antecedent. There are many ways in which hearers can come upon information that will spoil a movie for them, which are not assertions by an interlocutor. Assertion is a theoretical notion, and Ebert et al. do not take any steps to show that there is assertion of the consequent in (i).

for the analysis of chimericity, as will become clear below. The second is in how the entailment of the consequent is derived. In Franke's analysis, what determines whether a conditional is hypothetical or biscuit is what the hearer assumes about the status of the antecedent and consequent in the speaker's information state. I argue instead that biscuit readings require a stronger condition. Biscuit interpretations arise in contexts in which independence is pragmatically presupposed. This independence presupposition translates into a kind of admissibility constraint on common grounds.

4.1 Franke's analysis: Independence

Franke (2007) analyzes the biscuit/hypothetical contrast in terms of what he calls *epistemic (in)dependence*, a notion is closely related to Lewis' (1988) *orthogonality of subject matters*. Lewis defines a subject matter as a partition of the set of possible worlds into at least two cells, non-universal equivalence classes of worlds that agree in some respect.[6] For example, the subject matter of whether it is raining partitions the set of worlds into two cells, one containing all the worlds that agree that it is raining, and another that contains all the worlds that agree that it isn't.[7] Two subject matters M_1, M_2, are orthogonal when the partitions they induce crosscut each other, so that every cell of M_1 intersects every cell of M_2.

The core idea Franke wants to capture is that two propositions p, q are epistemically independent when, in an epistemic state in which they are not already known to be true or false, learning the truth value of one is not enough to determine the truth value of the other. If epistemic states are taken to be sets of worlds, this is clearly the case in any epistemic state in which two subject matters, one partitioning the state into p and non-p worlds, the other into q and non-q worlds, are orthogonal. Franke's definition

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[6]Lewis deliberates whether to call the one-celled partition a degenerate subject matter or not to call it a subject matter at all, and, for convenience, opts for the latter.

[7]2001 makes similar use of alternatives to the antecedent to account for the inference known as *conditional perfection*. He argues that uttering a conditional implies that the speaker does not believe that the consequent is true no matter what. In other words, conditionals implicate that the consequent raises an issue, or creates a subject matter, for the speaker. This is of course not the case with biscuit conditionals, which, as we saw, imply the unconditional truth of the consequent. The heart of the analysis proposed here is that implication that the consequent creates a subject matter for the speaker is cancelled when it is presupposed that such a subject matter is orthogonal to a subject matter raised by the antecedent.

of epistemic independence is reproduced in (26)

(26)   **Epistemic Independence**: (Franke 2007)
Two propositions p, q are epistemically independent iff
for all $A \in \{p, \neg p\}$ and all $B \in \{q, \neg q\}$,
$\Diamond A \ \& \ \Diamond B \rightarrow \Diamond(A \ \& \ B)$

This notion of independence is then used to derive the properties that differentiate biscuit from hypothetical conditionals as follows.[8] Conditionals receive the simple dynamic interpretation in (24) above. Thus, a speaker uttering a conditional *if p,q* is proposing to update the common ground c so that all the p worlds are q worlds, i.e. so that $c + p \vDash q$. Assuming the speaker is abiding by quality, this indicates that the speaker's own epistemic state σ is such that $\sigma + p \vDash q$. Now, some pairs of propositions p and q are such that, in Franke's formulation, "normally we would not expect [their] truth or falsity ... to depend on one another" (p. 92). This is for example the case with the propositions *you are thirsty* and *there is beer in the fridge*. So a speaker can normally be taken to assume that these two propositions are epistemically independent, i.e. that (26) holds for these two propositions in the speaker's epistemic state. If this is the case, and yet the speaker is sincerely uttering the conditional *if p,q*, thereby indicating that in her epistemic state, the p worlds are a subset of the q worlds, then the speaker must either believe that p is false, or else that q is true. This is so because if it were epistemically possible for the speaker that p, and also possible that $\neg q$, then by epistemic independence, it would be possible that $p \ \& \ \neg q$, which contradicts what the speaker is literally saying. However, a speaker uttering a non-counterfactual conditional strongly implies that the antecedent is at least possible in their epistemic state, as evidenced by (27).[9] In fact, Leahy (2011) suggests that this is a semantic presupposition of indicative conditionals.

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[8]See Franke (2009) for illuminating discussion of the intellectual roots of this idea, and van Rooij (2007) for an illustration of how independence can be used to account for the strengthening of so called conditional presuppositions (the so called "proviso" problem). In fact, van Rooij's strengthening account for conditional presuppositions and Franke's strengthening account, adopted here, of biscuit conditionals, are almost exactly parallel: the reasoning applied by van Rooij to the presupposition of the consequent is here applied to the consequent itself.

[9]An exception is when it is common ground that the consequent is false, or when antecedent and consequent are in contradiction, as in the example in fn. **??**. In this kind of case, the speaker can expect the hearer to recognize their intention to communicate the belief that the antecedent is false based on the blatant implausibility of the conse-

(27)   #David left yesterday. If he is still here, we can go out for drinks.

Therefore, the hearer must conclude that the speaker believes the consequent
q to be true. Thus, the utterance implies the consequent, and the implication
can only be cancelled if the assumption that the speaker believes p and q to be
independent is given up, in which case the conditional becomes hypothetical.

This explanation insightfully derives the most important interpretative
property distinguishing biscuit from hypothetical conditionals, the implica-
tion of the consequent, as a pragmatic strengthening effect, and I adopt it
here, with two modifications. First, as noted already by Franke, the defi-
nition in (26) has the unwelcome consequence that, whenever a proposition
is known, it is automatically independent of all other propositions, includ-
ing itself. Beyond the unintuitive nature of this result, it also interferes
with Franke's explanation of the pragmatic strengthening responsible for the
implication of the consequent. It is easy to imagine contexts in which the
hearer assumes that the speaker knows the truth value of the antecedent,
consequent, or both, and nevertheless interprets the speaker's utterance as a
hypothetical conditional.

For example, consider the scenario of a child playing a game with an adult.
The game involves a box with holes of different colors and balls matching
the colors of the holes. The child is supposed to put each ball into the hole
that matches its color. The parent knows that, if the child correctly matches
the colors, the ball reappears in a slot after a few seconds, and if not, it
stays trapped inside a tube and must be released. The child however does
not know this, since she has not played this game before. The child proceeds
to take a ball and put it in one of the holes. Suppose the child is perfectly
aware that the adult knows whether her choice was right or not, and she is
also aware that the adult knows the outcome of a correct and an incorrect
choice. The adult says:

(28)   If you made the right choice, the ball will come out here.

In this case, the child clearly assumes that the two propositions, *you chose
the right hole* and *the ball will come out here*, are independent on the adult's
information state, simply because it is common ground between child and
adult that the adult knows the truth value of the antecedent, and perhaps

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quent. However, such an expectation is unmotivated in a context in which the truth of
the consequent is a live possibility.

also that of the consequent. It is thus the case that the parent's information state entails either that the antecedent is true, or else that it is false. Therefore, on the parent's information state, it is either false that $\Diamond$(*you made the right choice*), or else it is false that $\Diamond$(*you made the right choice*). If either of these is false, than according to (26), the antecedent and consequent are independent. But (28) is clearly not a biscuit conditional. It does not generally entail it's consequent, and will not entail it for the child either. Rather, (28) informs the child of the dependency between choosing the right hole and the ball reappearing. In fact, this is a case likely to trigger a conditional perfection inference. In this kind of scenario, then, pragmatic strengthening should kick in, yielding a biscuit interpretation, contrary to fact.

To overcome this problem, Franke (2009) proposes an amended definition where independence is defined not in terms of an agent's epistemic state, but a state derived from it by belief revision. Thus, two propositions are independent if and only if they are independent on the speaker's information state, or would have been independent on that state were the truth of the antecedent not known already. This notion of independence avoids the problem just discussed. However, belief revision is a thorny issue and gives rise to non-trivial questions. For example, the question arises how the child in our scenario could reason about the speaker's revised information state, given that she does not have access to the speaker's current information state. Perhaps what the hearer does is assume that there is at least one such revised state in which the two propositions are not independent. Be that as it may, it seems to me preferable to circumvent these issues by not making independence contingent on the speaker's epistemic state.

4.2 Independence as pragmatic presupposition

I propose to view the independence of the antecedent and consequent issues as a pragmatic presupposition.[10] A pragmatic presupposition is defined by Stalnaker (1974) to be a condition that a speaker normally takes to hold of the common ground between the interlocutors when she utters a sentence. Thus, for a biscuit reading to arise, the antecedent and consequent issues must be independent in the common ground, rather than the speaker's epistemic state. In order to spell out this suggestion, I propose to replace Franke's

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[10]I believe that pragmatic presupposition is the notion that Franke is intending as well, and van Rooij (2007) is explicit about independence being a presupposition.

definition of epistemic independence with a definition of *issue dependence.*
Issues are not taken to be sets of propositions, but rather sets of formulae.
The reason for this is that some formulae, in particular those crucial in
producing chimericity, cannot be identified with proposition, as shown in §5.
(29) defines when a set of formulae forms an issue relative to a context c,
building on (Hulstijn 1997). Issues are simply a dynamic, hence partiality
sensitive, version of Lewis's subject matters.

(29)   **Issues** (first version):
        A set of CCPs ϕ? is an issue relative to a context c iff

  (i)   **Definedness**: $c + [\phi]$ is defined for all $\phi \in \phi$?
  (ii) **Partition**: For any $\phi, \psi \in \phi$? such that $\phi \neq \psi$, $c + [\phi]$ and $c + [\psi]$
        are disjoint, and every possibility in c survives in $c + [\phi]$ for some
        $\phi \in \phi$?

The antecedent and consequent of a conditional are each associated with an
issue. Many factors go into determining which issues a conditional raises,
including speaker intentions, mutual conversational goals, etc. The nature
of these factors cannot be explored here and is not pertinent to the anal-
ysis of chimericity. Very typical issues for a conditional to raise are the
ones considered by Franke, containing a proposition and its polar opposite.
However, other issues are also possible, for example ones corresponding to
which-questions, containing a proposition and some salient alternatives to
it.[11]

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[11] An interesting consequence of (29) is that there are conditionals, like (i), whose
antecedent and consequent cannot be jointly associated with issues.

(i)   If John has a sister, John's sister is Catholic.

(i) would normally be uttered in a context which does not satisfy the presupposition
of the consequent, namely that John has a sister. Therefore, there is no way to assign
the consequent an issue relative to the input context, making it impossible to determine
whether the antecedent and consequent issues of (i) are dependent in Franke's sense or not.
An obvious way of dealing with this kind of case is to make definedness condition for issues
sensitive to the dynamics of interpretation, and require that the CCPs in the consequent
issue be defined locally in the context resulting from updating the input context with the
antecedent. The theoretical desirability of such a move hangs on whether one thinks (i)
should be modeled as a hypothetical conditional. (i) is clearly not a biscuit conditional.
However, it is arguably not a normal hypothetical conditional either. While an epistemic
relation between antecedent and consequent in (i) is undeniable, it seems wrong to say
that learning whether or not John has a sister could change one's opinion about whether

Two issues $p?, q?$ are said to be dependent relative to a context c when (i) both induce non-single celled partitions on c and (ii) resolving $p?$ in c leads to at least partial resolution of $q?$ in c, i.e. deletes at least on of the cells in the partition induced by $q?$. Because issues are sets of CCPs, the definitions in (30) are stated in terms of context update.

(30)   **Issue dependence** :
       Two issues $p?$ and $q?$ are dependent relative to a context c iff:
       a.   For every $\phi \in p? \cup q?, c + \phi \neq \varnothing$ and
       b.   For at least one $\phi \in p?$ and one $\psi \in q?$, $c + [\phi] \vDash \psi$.

Taking the worlds that survive in $c + \phi$ for any ϕ in $p?$ or in $q?$ to be a proposition, $p?$ and $q?$ are dependent when they form subject matters relative to c and these subject matters are not orthogonal. Like Franke's epistemic independence, issue independence as defined here is symmetric – whenever $p?$ and $q?$ are independent, so are $q?$ and $p?$. In other words, whenever there is a $\phi \in p?$ and a $\psi \in q?$ such that $c + [\phi] \vDash \psi$, there is also a $\psi' \in q?$ and a $\psi' \in p?$ such that $c + [\psi'] \vDash \phi'$.[12]

Biscuit readings of conditionals arise when the antecedent and consequent issues are pragmatically presupposed to be independent. Whether two issues are independent or not is a structural property of information states, which can change when new information is added. In fact, the effect of uttering a hypothetical conditional is often exactly to inform the hearer that two issues are dependent, and thus to propose a change to the structure of the common ground. The pragmatic presupposition that two issues are independent is meant to rule out such changes to the structure of the common ground, and in this it differs slightly from the standard case of presupposition. Standardly, presuppositions are admissibility constraints on the input common ground. Since information flow is modeled as monotonic, any constraint satisfied in the input common ground remains satisfied in any output common ground. In the case of a structural constraint, the monotonicity of information update

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or not John's sister is Catholic. Similarly, it is absurd to ask whether it would remain true (or false) that John's sister is Catholic if it turned out he didn't have one. I do not attempt to resolve this issue here.

[12]To see this, suppose $p? = \{\phi, \phi'\}$ and $q? = \{\psi, \psi'\}$. By definition, $c + [\psi], c + [\psi']$ are mutually exclusive and exhaustive of c, as are $c+[\phi], c+[\phi']$. Therefore, $c+[\psi'] = c/c+[\psi]$, and $c + [\phi'] = c/c + [\phi]$. By assumption, $c + [\phi] \vDash \psi$, so that $c + [\phi] \subseteq c + [\psi]$. Therefore, since $c + [\psi'] = c/c + [\psi]$, $c + [\psi'] \cap c + [\phi] = \varnothing$. It follows that $c + [\psi'] \subseteq c/c + [\phi]$, i.e. $c + [\psi'] \subseteq c + [\phi']$, which means that $c + [\psi'] \vDash c + [\phi']$.

does not ensure this kind of persistent satisfaction across common grounds. I therefore propose to build persistence under updates into the nature of the pragmatic presupposition of independence, modeling it as an admissibility constraint on input as well as output common grounds. For a biscuit reading to arise, then, it is crucially not enough that the speaker's epistemic state makes the antecedent and consequent issues independent, nor even that the common ground between the interlocutors does so. Rather, it must be taken to be common knowledge that the two issues are independent, in the input as well as any output common ground between them.

The source of a pragmatic presupposition that two issues are not dependent is usually world knowledge. For example, our knowledge of causal interactions in the world dictates that internal states such as thirst do not have the causal power to bring objects into existence, or to make them change location. A speaker would therefore normally assume that the issues `are you thirsty?` and `is there beer in the fridge?` are independent in the common ground. However, this is a default assumption, and can be overridden in light of specific contextual information. In a context in which the existence of the relevant causal connection is known to be possible, the pragmatic presupposition can be suspended.

Franke's strengthening account of the implication of the consequent by biscuit conditionals carries over straightforwardly to this slightly modified version of his account of the distinction. Consider again (31), with (31-a) and (31-b) representing the antecedent and consequent issues, respectively, t standing for `the hearer is thirsty`, and b for `there is beer in the fridge`.

(31)   If you're thirsty there's beer in the fridge.
    a. $T? = \{t, \neg t\}$
    b. $B? = \{b, \neg b\}$

Suppose it is taken for granted, as it normally is, that internal states such as thirst do not have the causal power to bring objects into existence, and that there is no situation-specific reason to assume that learning that the hearer is thirsty epistemically leads to the conclusion that there is beer in the fridge. In such a context, the speaker pragmatically presupposes that $T?$ and $B?$ are independent. In uttering (31), the speaker is suggesting to change the common ground in a way that would make it the case that all possibilities in which t is true are also ones in which b is. There are two

ways for the hearer to do this without violating the presupposition that $T?$ and $B?$ are independent. The first is to conclude that the speaker knows the antecedent to be false, and the second is to conclude that she knows the consequent to be true. This first option is ruled out for the same reason as in Franke's account, namely that indicative conditionals presuppose that the speaker holds the antecedent to at least be possibly true. The hearer will thus opt for the second option, deleting from the common ground all possibilities in which there is no beer in the fridge.[13] The resulting common ground of course entails the consequent.

Here as in Franke's account, the strengthening of biscuit conditionals to unconditionals arises from the interaction of the semantics of conditionals with a pragmatic assumption, here taken to be a pragmatic presupposition. It is important to stress that a pragmatic strengthening account does not predict that the implication of the consequent is cancelable. This implication is not an implicature, and is not generated by reasoning about conversational intentions. Rather, it is a contextual entailment of the output common ground given that certain presuppositions are met.

As pointed out in the introduction, biscuit conditionals also imply an unconditional. This face also receives a very natural explanation within the current analysis of the biscuit / hypothetical distinction. Rawlins (2008) has argued that unconditionals assert that the antecedent issue is orthogonal to the consequent issue. Assuming this analysis is essentially correct, it follows that utterances of biscuit conditionals pragmatically presuppose what unconditionals assert. The truth of an unconditinoal thus comes out as a necessary contextual inference of biscuit readings of conditionals.

A conditional receives a hypothetical reading when there is no pragmatic presupposition of independence, in which case there is no reason for the hearer not to update the common ground in the usual way (unless, of course, they believe the speaker's assertion to be false).

Summarizing, the analysis proposed here is that biscuit conditionals are just regular conditionals semantically, set apart from hypothetical conditionals is that their antecedent and consequent raise issues that are pragmatically

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[13]Note that is does not matter here whether the speaker also knows whether the hearer is thirsty or not, and even if this is part of the common ground or not. The following is perfectly natural:

(i)   I see you're thirsty. If you're thirsty, there's beer in the fridge.

presupposed to be independent. Issue independence is analyzed essentially as question orthogonality in Lewis' sense. The pragmatic presupposition that the antecedent and consequent issues are independent requires these issues to be independent in the output common ground, a requirement which brings about a strengthening of the actual context change effect of the conditional, as suggested in Franke (2009). This strengthened dynamic effect leads to a context that entails the truth of the consequent. Having laid out an analysis of the biscuit / hypothetical distinction, it is possible to turn to the main goal of the paper, namely an analysis of chimericity. Before doing so, section 4.3 briefly discusses the pragmatic question of the motivation for using biscuit conditionals.

4.3   The conversational rationale of biscuit conditionals

If the semantic effect of a biscuit conditional is, essentially, to assert the consequent, this raises the question why a speaker would ever utter a biscuit conditional rather than simply uttering the consequent. A common intuition in the literature (for example Van der Auwera 1986; Iatridou 1991; Geis and Lycan 1993) is that conversationally, the antecedent plays some role in increasing the assertability of the consequent, e.g. by ensuring that an assertion of the consequent is relevant, polite, or appropriate in some other sense. On DeRose and Grandy's (1999) conditional assertion analysis, all conditional sentences, hypothetical or biscuit, assert their consequent, if they assert anything at all. The assertability of the consequent is conditional on the truth of the antecedent. Unless the antecedent is true, the speaker is not in a position to assert the consequent. The difference between biscuit and hypothetical conditionals is in which criteria of assertability depend on the truth of the antecedent. Hypothetical readings arise when the speaker is not confident enough about the truth of the consequent to assert it, but is confident enough about its truth given the truth of the antecedent. Biscuit readings arise when the speaker is not confident enough about the **relevance** of the consequent to assert it, but is confident enough about its relevance given the truth of the antecedent.

Conditional assertion, and conditional speech acts more generally, are controversial for various reasons (some of them, in my view, unjustified, see fn. 5), but one need not adopt DeRose and Grandy's theory in order to accept the basic intuition that the pragmatic rationale of biscuit conditionals has to do with consequent assertability. On the analysis proposed in this

paper, conditionals do not in general assert their consequent. Rather, when the issues raised by the antecedent and consequent are taken to be independent, the dynamic effect of the conditional becomes identical to that of the consequent. Nevertheless, by uttering a biscuit conditional, the speaker raises an issue associated with the antecedent, and which would not be raised by a simple assertion of the consequent. Raising this issue can have various conversational goals, which can motivate the use of a conditional form. The goal may be to make clear to the hearer what issue the speaker thinks the consequent is relevant for. Against the issue of whether you are thirsty or not, the information that there is beer in the fridge is clearly relevant. The goal might also be to make a simple gesture of politeness. In (32), raising the issues of whether the hearer minds that the speaker is going to light a cigarette is simply signaling to the hearer that the speaker is ready to take the hearer's concerns into consideration in deliberating her actions.

(32)   If you don't mind, I'm going to light a cigarette.

Furthermore, as Franke (2007) points out, the point of raising the antecedent issue, in many cases, can and should be articulated more precisely. He describes the following scenario. Suppose that we are about to go swimming and I am packing my bag. Suppose further that you are thirsty and this is common knowledge between us. If I then say *there is beer in the fridge*, you may not know how exactly this assertion is relevant. It might be that it is relevant because you are thirsty and I am offering you a drink, but it might equally well be that I am instead asking you to help me complete the packing. Uttering the biscuit conditional *If you're thirsty, there's beer in the fridge*, on the other hand, clarifies that I am asserting that there is beer because this is relevant to the issue of your thirst, and is a way for me to signal to you that you may drink the beer. In this case, asserting the biscuit conditional is not only more conversationally appropriate than a mere assertion of the consequent, it is also more informative. Except for informing you about the presence of beer, it also informs you about how you might go about quenching your thirst. Franke rightly concludes that biscuit conditionals fulfill a function of *optimizing* the discourse in some sense.

5   Chimericity

Turning now to the analysis of chimerical conditionals, consider again the hesit scenario and the running example (9), repeated in (33).

(33)   There are no guards if you enter from the south.

As discussed in §2, (33) is chimerical because it gives rise to contrasting biscuit and hypothetical intuitions. On the view elaborated in the previous section, the biscuit / hypothetical distinction corresponds to the presence or absence of a pragmatic presupposition of independence of the antecedent and consequent issues. The puzzle is that chimericity is present even when the world knowledge based assumptions that can motivate such a presupposition are fixed. For example, in the heist scenario, the assumption is that the distribution of guards is not causally or epistemically connected to the addressee's course of action, and yet the example (33) is still chimerical.

If the approach to the biscuit / hypothetical distinction presented above is correct, what could possibly be the source of chimericity? If world knowledge is fixed, then the antecedent and consequent issues clearly cannot be simultaneously presupposed and not presupposed to be independent. There must therefore be some property of the relevant conditionals that makes it the case that their antecedent and consequent are systematically associated with more than one set of issues. My proposal is that the relevant property is a semantic one, specifically a particular kind of context dependence in the consequent which is familiar from the literature on definite descriptions and definite implicit arguments.

Specifically, in what follows I show that chimerical consequents contain a presuppositional element interpreted like a definite description. As a consequence, the sentence in (33) is interpreted roughly as if it were the sentence in (34).

(34)   If you enter from the south, there are no guards at *the entrance.*

A definite description like *the entrance* can be interpreted as a rigid designator, referring to a particular entrance. It can also be interpreted as an individual concept, denoting, in different worlds, the location one enters through in that world. Such an interpretation is, for example, the salient interpretation of the italicized sentence in (35).

(35)   Whenever I enter a building in this city, *the entrance is dirty.*

In (33), and in chimerical conditionals more generally, the consequent is ambiguous between an interpretation involving a rigid designator and one involving a concept. Each interpretation gives rise to a different consequent issue. On the rigid interpretation, the consequent issue for (33) is whether or not there are guards at the south entrance. On the concept interpretation, it is whether or not there are guards at the entrance the addressee chooses to enter through, possibly a different one across possibilities in a context. These consequent issues interact differently with the antecedent issue. Intuitively, given the assumptions in the heist scenario, whether or not a particular entrance, say the south entrance, is guarded or not does not depend on the addressee's plans and actions. In contrast, whether or not the entrance you choose is guarded or not surely can depend on what entrance you choose, since some entrances might be guarded and others not. Thus, the ambiguity of chimerical consequents brings about two sets of issues, one of which is contains issues that are pragmatically presupposed to be independent, the other of which does not. The question is which set of issues arises when, and why it arises when it does. The rest of this section elaborates this informal description of the analysis in a way that answers these questions.

5.1 Chimerical consequents and familiarity presuppositions

My analysis of pins chimericity on the interpretation of chimerical consequents. The examples in (36) show that the consequent of (33), `There are no guards`, expresses different propositions in different contexts.

(36)   a.   Look! There are no guards!
        b.   I checked my office. There are no guards.
        c.   Every prisoner who tried to escape thought there were no guards.

(36-a) is normally interpreted *deictically*, as saying that there are no guards at the location of utterance. (36-b) shows a *discourse anaphoric* interpretation, where the sentence is taken to express the proposition that there are no guards in my office. Finally, in (36-c), a so called *bound variable* reading arises, in which case the sentence does not express a single proposition. Rather, for each prisoner quantified over, it says that that prisoner thought

that there were no guards at the prison they tried to escape from. What this shows is that the consequent of (36) does not express a stable proposition – its content is variable with context.

The context dependence exhibited by `There are no guards` is identical to that generally exhibited by sentences containing implicit arguments, in particular ones containing what Fillmore (1986) calls *definite null anaphors*. As observed by Mitchell (1986) and Partee (1989), lexical predicates whose interpretation involves such anaphors, such as *local*, give rise to the three readings exemplified in (36). This is shown for *local* in (37).

(37)   a.   We can watch the game at a local bar. (deictic)
        b.   We were in Berlin and watched the game at a local bar. (discourse anaphoric)
        c.   Every fan watched the game at a local bar. (discourse anaphoric)

Partee proposes that these three readings correspond to different ways in which context can determine an antecedent for the implicit anaphor. Building on this insight, Condoravdi and Gawron (1996) develop an analysis of the context dependence of implicit arguments which links them to definite descriptions, by pinning their range of interpretation on the presence of familiarity presuppositions such as are associated with definite descriptions in Heim's (1982) theory of definiteness as familiarity. For example, in the cases in (37), the implicit argument is presupposed to be a familiar location. In (36), the implicit argument is, roughly, the location that is said to contain no guards.

Condoravdi and Gawron show that adopting a dynamic framework like the one assumed here allows for these three kinds of reading to be captured uniformly, by modeling familiarity presuppositions as restrictions on input contexts. Their analysis is extended to sentences like (36) in Francez (2009), and I adopt it here. A familiarity presupposition is the requirement that the domain of the input context contain a certain discourse referent (represented as a variable), and entail that this referent fulfill some descriptive conditions. For example, the CCP of a sentence containing a definite description is shown in (38).

(38)   a.   The dog^y died.
        b. $c + [\text{the dog}^y \text{ died}] = \{i \in c : y^i \in \text{died}^i\}$
              if $y \in dom(c)$ and $\forall i \in c, y^i \in \text{dog}^i$
              Otherwise undefined.

In order for the CCP of (38-a) to be defined, the variable y must be a member of the domain of the input context c, and c must entail that y is a dog.[14] Implicit arguments are similarly associated with familiarity presuppositions. For example, an utterance of (39), involving the lexical predicate *local* presupposes that a familiar location to which the relevant hotel is local.

(39)   I stayed at a local^x hotel.

Technically, for an utterance of (39) to perform an update, the variable x must already by in the domain of the input context, and the value assigned to x by the assignment function in every possibility throughout that context must be a location.

The different readings of implicit arguments correspond to the different ways in which context can satisfy their presuppositions. Deictic readings arise when the presupposition is fulfilled because of features of the context of utterance. For example, any context in which something is uttered is a context in which the location of utterance is familiar and in which it is common ground that it is a location. Discourse anaphoric readings arise when the presupposition is satisfied by a referent introduced in a previous utterance. Bound variable readings arise when the presupposition is satisfied in the "auxiliary" contexts constructed in the calculation of a quantificational sentence, the details of which are irrelevant here (see Condoravdi and Gawron 1996). If the input context does not contain the relevant referent, sometimes the referent can be accommodated. (37-c) is an example of such accommodation.

(40)   Every fan$_x$ watched the game at a local$_z$ bar.

In (40), the familiar location z is, for each fan, the location they are in. The input context, presumably, does not contain variables for each of these locations. Instead, they are accommodated via the relation they bear to the fans. Condoravdi and Gawron define the relevant notion of accommodation as in (41).

(41)   **Ordinary Accommodation** (Condoravdi and Gawron 1996:15): The information necessary to satisfy the familiarity presupposition

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[14]A context c entails a formula ϕ iff ϕ is true in every possibility in c. This notion is the same as the notion of support defined above, except in that it does not allow that ϕ introduces new variables.

of a definite NP can be accommodated to a state c, yielding a new state c', by relating the definites discourse marker through some relation to a discourse marker in the domain of c.

Thus, if c is a state, x a referent in $dom(c)$, and R a relation, the state $\text{ACCOM}(c, R, x, y)$ resulting from accommodating y by relating it through R to x is defined in (42).

(42) $\text{ACCOM}(c, R, x, y) = \{j : \exists i \in c : i <_y j \ \&\langle x^j, y^j \rangle \in R^j\}$

In (41), the discourse referent z is introduced via the relation *located-at* that it bears to each fan introduced by the quantification.

In the cases in (36), the implicit argument is also presupposed to be familiar location.[15] In (36-a), the familiar location is determined to be the location of utterance. In (36-b), it is the location introduced by the first sentence.[16] In (36-c), it is the accommodated prison from which each prisoner is trying to escape. The meaning of the consequent of the chimerical conditional (33) can thus be represented as in (43).

(43) $c + [\text{there are no guards}^{z,l}] =$
     $\{i \in c : \exists j : f_i <_z f_j \text{ and } z^j \in \text{guard}^j \text{ and } \langle z^j, l^j \rangle \in \text{at}^j\}$
     if $l \in dom(i)$ and $l^i \in \text{location}^i$ for all $i \in c$
     else undefined.

In words, updating a context c with `There are no guards` preserves all and only those possibilities in c that can be extended with a variable z assigned to some guards located in the familiar location l. If there is no familiar location l, the update is undefined.

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[15]I leave open here the question of whether this implicit argument is an argument of the determiner, of the NP, or of the verb *be*. If there are empirical ways to decide this, the decision is inconsequential to the semantic analysis of the relevant sentences. Furthermore, treating the implicit argument as a location is an oversimplification, but this is not relevant here. See Francez (2009) for discussion of the simplification involved

[16]This is of course not the *only* way to interpret this sentence. The role of the semantic theory presented here is to account for the observed readings, not to provide a mechanism of anaphora resolution.

5.2 Issues for chimerical consequents

Going back to (33), the familiarity presuppositions associated with the implicit argument of the consequent can now be used to explain the systematic ambiguity of chimerical consequents between a rigid and a non-rigid interpretation, which in turn paves the way to understanding the conditions under which chimerical consequents are associated with different issues.

Consider two versions of the heist scenario. In the first, suppose it is common ground between the interlocutors that there is a southern entrance l, but it is unsettled whether the addressee will enter the museum or not. In this case, the presupposition of the antecedent `you enter from the south`, namely that the south entrance is familiar, is satisfied in the global context (for current purposes, I make the simplifying assumption that the trigger of this presupposition is the noun phrase *the south*, treating it as a shortened name for *the southern entrance*). The CCP for the antecedent can be written as in (44). The notation @ is used for the addressee of the context, glossing over the issue of indexicality, for which see the discussion in Condoravdi and Gawron 1996)

(44) $c + [\text{you enter from the south}^l] = \{i \in c : \langle l^i, m^i, @^i \rangle \in \text{enter}^i\}$
      if $l \in dom(i)$ and $l^i \in \text{south-entrance}^i$ for all $i \in c$, else undefined.

The antecedent can then be associated with the issue in (45), the issue whether the addressee enters from the south entrance or not.

(45)   {you enter from the south entrance, you don't enter from the south entrance}

The context as described also makes available a particular interpretation for the consequent, which can be called the *rigid* interpretation. On this interpretation, the implicit argument in the consequent anchors to the familiar location l, the south entrance, as in (46).

(46) $c + [\text{there are no guards}^{z,l}] = \{i \in c : \neg \exists j : f_i <_z f_j \text{ and } z^j \in \text{guard}^j \text{ and}$
      $\langle z^j, l^j \rangle \in \text{at}^j\}$
      if $l \in dom(i)$ and $l^i \in \text{location}^i$ for all $i \in c$, else undefined.

This is a rigid interpretation because the discourse referent l refers to the south entrance throughout all the possibilities in the context c. On this interpretation, the consequent issue is whether there are guards at the south

entrance or not.

(47)   { there are guards at the south entrance, there are no guards at the
         south entrance }

Clearly, the antecedent issue in (45) and the consequent issue in (47) are, normally, be pragmatically presupposed to be independent. Given what we generally know about the causal effects of entering a building, and given what we generally know about the distribution of guards in museums, a speaker generally takes for granted, and assumes the hearer to take for granted, etc. that learning whether or not the addressee will enter from the south or not cannot reveal anything about whether the south entrance is guarded or not. Franke's strengthening process discussed above for biscuit conditionals will then kick in. The CCP of the conditional is the one in (48).

(48) $c + [\text{if you enter from the south}^l, \text{there are no guards}^{z,l}] =$
         $\{i \in c | i \not< c + [\text{you enter from the south}^l] \vee$
         $i < c + [\text{you enter from the south}^l] + [\text{there are no guards}^{z,l}]\}$
         if $l \in dom(i)$ and $l^i \in \text{location}^i$ for all $i \in c$, else undefined.

If the common ground is heterogeneous about whether the addressee enters from the south or not (i.e. contains possibilities in which she does and ones in which she doesn't), and about whether the south entrance is guarded or not, then the effect of updating with (48) is a common ground in which learning that the addressee did enter from the south would determine that the south entrance is guarded, violating the presupposition that the two issues in (46) are independent. Therefore, the hearer will seek a way to update the common ground that would not violate the presupposition and still accord with (48). On the assumption that speakers who utter conditionals presuppose the antecedent to be at least possibly true, the only way to update the common ground in accordance with (48) is to delete all possibilities in which there are guards at the south entrance. The resulting common ground entails the consequent, on its interpretation in (46).

The second version of the heist scenario to be considered is one in which the context already determines that the addressee will enter the museum, but does not determine what entrance among several possible ones she will choose. In this kind of context, all possibilities are ones in which the speaker enters the museum, and it is therefore possible to accommodate a discourse referent for the entrance through which the hearer enters in each possibility,

using the notion of accommodation defined in (42) above. This gives rise to a different interpretation for the conditional. The meaning of the antecedent stays the same, as does the antecedent issue, which is the one in (45), but the consequent interpretation changes. Letting u be the accommodated referent for the chosen entrance, the interpretation of the consequent is the one in (49).

(49) $c + [\text{there are no guards}^{z,u}] =$
$\{i \in \text{ACCOM}(c, \text{enter-from}, @, u) : \neg \exists j : f_i <_z f_j \text{ and } z^j \in \text{guard}^j \text{ and } \langle z^j, u^j \rangle \in \text{at}^j\}$

This interpretation involves a *non-rigid* reading of the implicit argument of the consequent. The discourse referent u refers to possibly different locations across the different possibilities in $\text{ACCOM}(c, \text{enter-from}, @, u)$. Correspondingly, the consequent can in this case be associated with the issue in (50) instead of the one in (46) above.

(50) { there are guards where you enter, there are no guards where you enter }

In contrast with the issue in (46), there is no reason for a speaker to pragmatically presuppose that the consequent issue in (50) and the antecedent issue in (45) are independent. Given what we generally know about the epistemic effects of resolving identity questions, determining what the chosen entrance is might very well reveal whether the chosen entrance is guarded or not. This is the source of the hypothetical intuition. The CCP for the conditional on the non-rigid interpretation is the one in (51), assuming global accommodation of u. In (51), c^{+u} stands for the derived context $\text{ACCOM}(c, \text{enter-from}, @, u)$.

(51) $c + [\text{if you enter from the south}^l, \text{there are no guards}^{z,u}] =$
$\{i \in c^{+u} \mid i \nless c^{+u} + [\text{you enter from the south}^l] \vee$
$i < c^{+u} + [\text{you enter from the south}^l] + [\text{there are no guards}^{z,u}]\}$
if for all $i \in c^{+u}$, if $l \in dom(i)$ and $l^i \in \text{south-entrance}^i$, else undefined.

By assumption, the common ground contains only possibilities in which the addressee enters the museum, but is heterogeneous as to what the entry point is. The effect of updating with (51) is a common ground which is still heterogeneous about this, but in which in which all the possibilities in which the entry point is the south entrance are ones in which that entry point is

guarded. The new information carried by the speaker's utterance in this case is therefore that the south entrance is guarded. While the resulting common ground entails that the south entrance is guarded, it does not entail the consequent on its non-rigid interpretation – it does not entail that the entrance chosen by the addressee is guarded, since it contains possibilities in which the addressee chooses a different, non-guarded entrance.

Assuming global accommodation of u requires a small modification in the definition of issues. The definition in (29) requires an issue to partition the context in which it is an issue, and partition is defined in terms of possibilities. However, an issue containing the CCP in (49) does not partition the possibilities of the input context c, but rather those in the accommodation context $\text{ACCOM}(c, \text{enter-from}, @, u)$. These possibilities are systematically related to those of the input context. For every possibility i in $\text{ACCOM}(c, \text{enter-from}, @, u)$, there is a possibility j in c such that $w_i = w_j$. In other words, accommodation preserves the worlds of the original context, extending the assignment functions. In order to say that the issue in (50) partitions the input context, partition must be defined in terms of the set of worlds of the context W_c, as in (52), rather than the context itself.

(52)　　**Issues** (2nd version):
　　　　A set of CCPs p? is an issue relative to a context c iff

　　　(i)　**Definedness**: $c + [\phi]$ is defined for all $\phi \in p$?
　　　(ii)　**Partition**: For any $\phi, \psi \in p$? such that $\phi \neq \psi$, $c + [\phi]$ and $c + [\psi]$ are disjoint, and for every world $w \in W_c$, a possibility i such that $w = w_i$ survives in $c + [\phi]$ for some $\phi \in p$?

This modification leaves the definition of issue independence intact. Note that adopting it has as a consequence that the availability of the non-rigid consequent issue is restricted to contexts that entail that the addressee enters the museum. This is because, if the context contains worlds in which the addressee does not enter the museum, then in these worlds there is no location at which the addressee enters. Consequently these worlds are not in the accommodation context $\text{ACCOM}(c, \text{enter-from}, @, u)$, and will not belong to either cell of the partition induced by the CCPs that make up the issue, and the issue will not be defined. This does not mean that accommodation of a discourse referent always requires a context that entails the existence of an entity satisfying the conditions associated with that referent. However, it does make the empirical prediction that hypothetical readings of chimeri-

cal conditionals such as (33) should only arise in contexts that entail the existence of an entity satisfying the conditions associated with the definite element in the consequent.

It is not clear that this prediction is correct. Suppose that, in the heist scenario, it has not been established between you and the expert that you will enter the museum. For example, suppose you are deliberating between a plan in which you enter the museum, and one in which you bribe or extort one of the guards. The expert might still utter (33) with a hypothetical interpretation. Thus, my analysis makes the problematic general prediction that hypothetical readings of chimerical conditionals arise only in contexts that entail the existence of an entity satisfying the presuppositions of the definite argument in the consequent.

One way of responding to this concern is to relax the partition requirement in the definition of issues, effectively "ignoring" the possibilities in the context that do not allow the required accommodation. In (53), partition is limited to those possibilities of the input context that can be distributively updated with one of the CCPs in the issue. This has the effect of collecting all and only those possibilities in which accommodation is possible.

(53)   **Issues** (final version):
       A set of CCPs $p?$ is an issue relative to a context c iff

       (i) **Definedness**: $c + [\phi]$ is defined for all $\phi \in p?$
       (ii) **Partition**: For any $\phi, \psi \in p?$ such that $\phi \neq \psi$, $c + [\phi]$ and $c + [\psi]$ are disjoint, and for every possibility $i \in c$ such that for some $\phi \in p?$, $\{i\} + [\phi] \neq \varnothing$, w_i survives in $c + [\phi]$.

This is the solution I adopt here, assuming that it does not introduce problems elsewhere in the theory of conditionals.

Other approaches to the problem are also possible. For example, one might remove the partition requirement from the definition of issues altogether, letting issues be simply sets of dynamic formulae, and model that the hypothetical reading of chimerical conditionals as involving focus in the antecedent. On this kind of approach, the antecedent issue for (33) might be taken to be (54) instead of the issue in (45) above.

(54)   {you enter from the south entrance, you enter from a different entrance }

The notion of independence needed to account for the biscuit / hypotheti-

cal distinction could then be dynamicized, requiring the consequent issue to form an orthogonal subject matter in the subset of the context determined by the antecedent issue (i.e. those worlds in which one of the formulae in the antecedent issue is true). In this kind of approach no accommodation is required, but focus is. I leave the question of how to choose empirically between global accommodation, focus, and other possible sources for the non-rigid, individual concept interpretation of the consequent for future research. What matters here is that hypothetical readings involve such an interpretation.

This concludes my proposed analysis of chimericity. To summarize it, the consequent of a chimerical conditional contains a possibly implicit definite element associated with familiarity presuppositions, and consequently can receive two different interpretations, one in which this element is interpreted rigidly and another in which it is not. Which interpretation is available depends on the properties of the input context, specifically on whether the familiarity presupposition is satisfied by anchoring to a rigid referent, whose value is constant across possibilities, or to a non-rigid one whose value changes across possibilities. The two interpretations give rise to two sets of issues, one of which is pragmatically presupposed to be independent, the other not. This is the source of chimericity.

6   Conclusion

In this paper, a new class of conditionals was described, chimerical conditionals, the hallmark of which is an ambiguity between biscuit and hypothetical readings. A pragmatic strengthening analysis of biscuit conditionals was proposed along the lines of Franke (2009), in which biscuit conditionals are regular conditionals whose antecedent an consequent are pragmatically presupposed to be independent or orthogonal. The chimericity of chimerical conditionals was argued to be rooted in the interpretation of their consequents. Chimerical consequents involve a possibly implicit definite element which is associated with familiarity presuppositions. It was shown that different ways in which context satisfies these presuppositions give rise to different interpretations of the definite argument, as a rigid designator or as an individual concept. Each interpretation gives rise to a distinct consequent issue. In one case, that issue is pragmatically presupposed to be independent of the antecedent issue, whereas in the other it is not, giving rise to chimericity.

The proposed analysis of biscuit conditionals involves an extension of the

standard notion of pragmatic presupposition to include *structural* admissibility conditions constraining both input and output contexts. This kind of presupposition is naturally modelled within the architecture of a dynamic framework. It is worth pointing out where the components of the proposed analysis of chimerical conditionals fall in terms of the division of labor between semantics and pragmatics. The biscuit / hypothetical distinction is a pragmatic one, resting on the presence or absence of a pragmatic presupposition of independence, and ultimately on world knowledge. The implication of the consequent in biscuit conditionals is a semantic property, but one that results from pragmatic strengthening of the meaning of the conditional. This strengthening is pragmatic because it is driven by the interaction between pragmatic presuppositions and assumptions about conversational principles, namely the assumption that the speaker is obeying the maxim of quality. Chimericity itself is completely semantic, stemming from an ambiguity of the consequent between two readings. Which reading is available is fully determined by properties of the input context, presumably the common ground. Stating the relevant contextual properties requires a conception of presupposition as admissibility conditions along the lines defended in Heim (1990), and chimericity can therefore be taken to provide further evidence that such a conception is required for modeling at least some presuppositions.

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