USING TASK-BASED ELICITATION TO MEASURE EFFECTIVENESS OF
COUNTERFACTUAL CONDITIONAL INSTRUCTION

BY

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THESIS

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Abstract

This study investigates the feasibility of using meaning-focused tasks to evaluate the degree to which ESL / EFL learners are able to use counterfactual second conditionals and related grammatical structures to perform certain illocutionary acts. To this end the researcher attempted to create tasks for which the production of the target grammatical structures would be "natural" (Loschcky & Bley-Vroman, 1993, p. 132). For the purpose of this study, "task naturalness" was defined as successful elicitation from a "significant majority" of native speakers. Using a process of "iterative, consensus-based, specification-driven testing" (Davidson & Lynch, 2002, p. 7), two types of tasks were developed: 1) Spoken dyadic role-plays designed to elicit expressions of willingness (e.g., "I'd love to help, but…") and 2) Written logic puzzles designed to elicit proof-by-contradiction (e.g., "If the light were off, Sherlock would know the answer."). In general, both task types were successful at eliciting either counterfactual second conditionals or related grammatical structures. This study represents the first step in a long term project to develop instructional materials to teach counterfactual second conditionals and related structures.

Keywords: conditional, counterfactual, counterfactuality, elicit, elicitation, illocutionary act, irrealis, proof-by-contradiction, refusal, second conditional, task natural, task naturalness, task-based learning, task-based testing

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Chapter 1: Introduction

Pedagogical Importance of Second Conditionals

ESL / EFL instructors with extensive experience teaching grammar will have encountered one or more textbook approaches to the following structures:

(1) If I have more time, I will study a foreign language.
(2) If I had more time, I would study a foreign language.

In traditional ESL / EFL textbooks these structures are referred to, respectively, as first and second conditionals. In more modern textbooks these structures may be referred with terminology which focuses more on meaning (e.g., "real" and "unreal" conditionals). But regardless of which terminology is used, these structures have been a staple of ESL / EFL instruction for many years.

Grammatically, all that distinguishes a second conditional (such as sentence [2]) from a first conditional (such as sentence [1]) is the tense of the head verbs in each clause. And although this grammatical difference is very slight, it can have a drastic effect on meaning. For instance, sentence (1) is a statement of a possible future undertaking to study a foreign language, whereas sentence (2) is a statement (perhaps a complaint) of the speaker's inability to even attempt such an undertaking.

The learners who would potentially benefit from such instruction are those whose L1 does not have separate ways of expressing these two meanings. For example, Chinese, Japanese, and Korean rely mostly on context to make a distinction in meaning such as that between sentence (1) and (2). On the other hand, for learners of English from certain L1 backgrounds, instruction will not be necessary. For instance, learners whose L1 is Spanish have little trouble with second conditionals, because their L1 has two separate forms for the two meanings.

Because the verb tenses in a conditional can have such a drastic effect on which meaning is conveyed, failure to use the correct tense can negatively affect a learner's intelligibility as a speaker. For this reason the inclusion of second conditionals in ESL / EFL textbooks seems well-motivated, especially when one considers the large number

of language learners (e.g., East Asian learners) who come from L1 backgrounds for which counterfactuality has no bearing on grammatical structure.

What Second Conditional Instruction Should Include

The impetus for the present study grew out of the researcher's own experiences throughout the years in attempting to teach second conditionals. Frustrated both by his own students' apparent lack of success in acquiring second conditionals and by how second conditionals are typically treated in ESL / EFL textbooks, the researcher set out to design more effective instructional materials. This study represents the first step of that endeavor.

If a textbook is to equip learners with the linguistic resources to *interpret* second conditionals, then it must, at a minimum, help learners understand how past tense contributes to the overall meaning of a conditional sentence. Also, if a textbook has the more ambitious goal of enabling learners to actually *produce* second conditionals, then it must also make learners aware of the communicative functions this structure can perform and in which contexts it is typically used. Moreover, exercises should involve contexts which are sufficiently similar to real world situations that there is a reasonable likelihood that transfer of learning will occur.

However, modern textbook treatments of second conditional do not consistently attend to all of these factors.

Typical Pedagogical Treatment of Second Conditionals

In this section I provide a brief critique of a unit from an ESL textbook which I believe to be a representative example of modern pedagogical treatments of second conditionals. It is a 12-page unit entitled "Present and Future Unreal Conditionals" from a recently published ESL textbook, *Focus on Grammar: An Integrated Skills Approach Third Edition*.[1]

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[1] The textbook does not actually use the term "second conditionals," probably because this term has fallen into disfavor in recent years. Nevertheless, second conditionals are the clear pedagogical focus of this unit.

In its explanation of the meaning of second conditionals, the unit is fairly comprehensive. It includes a 3-page section entitled "Grammar Presentation," which explains how conditionals of the form "*If* Clause: Simple Past + Result Clause: *Would (not)* + Base Form" express counterfactuality (Fuchs & Bonner, p. 338). More specifically, it instructs the learner to "use present and unreal conditionals to talk about unreal conditions and their results" (p. 339). It also makes explicit that second conditional sentences "can be about the present or the future." Finally, it cautions the learner to avoid a processing strategy which, though flawed, is very common among ESL / EFL learners: "The *if* clause uses the simple past, but the meaning is not past" (p. 339).

On the other hand, there is some room for improvement. Considering that it is impossible to predict the future, it may be misleading to refer to second conditionals with a future time reference as "unreal." Also, although the grammar presentation distinguishes between second conditionals with a present time reference and those with a future time reference, it provides no guidance as to how the learner can determine which time frame a given second conditional refers to.

In terms of the communicative functions which can be performed by second conditionals, only one is made explicit in this unit. In the section "Grammar Presentation," it is explained that giving advice can be done using the phrase "If I were you, …" (Fuchs & Bonner, p. 340), and later in the unit, this communicative function is the focus of a communicative practice exercise. Although there is one other communicative function (making excuses) which is also the focus of a practice exercise (which is aptly titled "Making Excuses"), this communicative function is not made explicit in the grammar presentation. In fact, the unit makes very little reference to communicative function at all. Consider the following:

(3) "If Marty _(be)_ a complainer, he _(moan)_ about the size of his apartment and spend the holiday at his parents' house. But Marty is a problem solver. This year he is hosting an open house. People can drop in at different times during the day, and there will be room for everyone."   (p. 342)

(4) "What complainers are really saying is, 'If I _(have)_ a magical solution, I _(not have to deal)_ with this myself.'"   (p. 342)

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(5) "If he _(thought)_ about the problem creatively, he _(can/find)_ find the time."

<div align="right">(p. 342)</div>

The conditional in example (3) is given as evidence that Marty is not a complainer, the conditional cited in example (4) as an excuse, and the conditional in example (5) as a recommended course of action. However, none of these communicative functions is made explicit in the grammar presentation, and only one of them (making excuses) receives specific focus in a subsequent grammar exercise.

Finally, although some of the example sentences and exercises in this unit involve contexts which learners may encounter in the real world, there are many examples where the relevance to the real world is not so apparent. Consider this example from the grammar presentation:

(6) "If I lived in a palace now, I would give parties all the time."   (p. 339)

Sentences very similar to (6) were the focus of an exercise which occurs later in the unit titled "What if?" which requires the learner to answer prompts beginning with "What would you do if you…?" (e.g., "What would you do if you had a million dollars?")

What characterizes sentences like (6) and those in the "What if?" exercise is that the "if" clause involves an outlandish but desirable condition. Admittedly, sentences involving outlandish conditions can be quite illustrative in that they show how second conditionals can be used to express counterfactuality. On the other hand, this genre of exercise (a very common one in EFL/ESL textbooks) does not seem to provide rehearsal for any real world task; i.e. learners may have difficultly imagining real world situations in which they would ever use such language.

Purpose of Study

Although modern pedagogical treatments of counterfactual second conditionals have some merit, there is much room for improvement, particularly with regards to the communicative functions which this structure can perform and the contexts in which it is

likely to occur. Recognizing this, the researcher set out to develop instructional materials which could be used to more effectively teach this challenging structure.

In order to demonstrate the effectiveness of the yet-to-be-developed instructional materials, the researcher realized it would be necessary to conduct a study with pre-, post-, and delayed tests, and that in order to design such tests, it would be necessary to develop test items which could be used to evaluate whether learners produce second conditionals in the same environments as native speakers. The present study is an attempt to develop such test items, and it represents the first step in a long term project to develop instructional materials.

Chapter 2: Literature Review

Defining Counterfactual Second Conditionals

The set of forms referred to as "conditionals" include a wide variety of structures, many of them incredibly complex and nuanced. As such, any pedagogical treatment of conditionals must, by necessity, limit its focus to a relatively narrow range of those structures.

For the sake of clarity, I provide below a definition of the structure which has played a central role in the present study, viz. counterfactual second conditionals. It draws heavily on Declerck and Reed (2001), an empirically-based reference work which provides an extensive taxonomy of conditionals, and which is based on a comprehensive analysis of naturally-occurring conditionals drawn from a variety of sources, most notably the Cobuild and LOB corpora.

Counterfactual second conditionals involve, on the one hand, the purely formal notion of second conditionals (regardless of whether they're counterfactual or not), and on the other hand, the purely semantic notion of counterfactuality. Either of these two notions, taken on its own, would constitute a much wider range of utterances than the present study is concerned with. On the other hand, counterfactual second conditionals lie at the intersection of these two notions and are therefore defined by them. So, to begin, I will provide a more precise definition of "second conditional," "counterfactuality," and the relationship between the two in the following sections: 1) Form, 2) Meaning, 3) Relationship between Form and Meaning

Form.

This section provides several definitions, each relating to the purely formal (i.e. divorced from any notion of meaning) notion of 'conditionals,'.

Conditional. Declerck and Reed (2001) avoid the term 'conditional meaning' and instead reserve the term 'conditional' to refer to a conditional sentence, i.e. "a two-clause structure in which one of the clauses is introduced by *if* (possibly

preceded by *only, even* or *except*) or by a word or phrase that has a meaning similar to *if, only if (*e.g., *provided*)" (p. 9).

   P-clause and Q-clause. Declerck and Reed (2001) use the terms "P-clause" and "Q-clause" as a short-hand for, respectively, the conditional clause and head clause of a conditional.

   Canonical pattern 1/2/3 conditionals*.* As Declerck and Reed (2001) point out, the conditionals presented in traditional grammar textbooks are generally limited to the following three (tense) patterns:

  – Pattern 1: *I will be happy if she comes.*
  – Pattern 2: *I would be happy if she came*.
  – Pattern 3: *I would have been happy if she had come.*   (p. 59)

   As a pedagogical model, the three patterns are, as Declerck and Reed (2001) warn, grossly oversimplified[2]. However, they endorse using the canonical patterns on a purely formal basis (p. 59).

   The three patterns are often labeled respectively as "possible," "unlikely," and "counterfactual." However, this pedagogical treatment of conditionals is also often criticized. By presenting 3 patterns in this way (as many English textbooks do), learners may infer (incorrectly) that there is a one-to-one correspondence between the 3 forms and the 3 meanings (p. 59). Moreover, such a pedagogical treatment does not include any discussion at all of counterfactual pattern 2 conditionals (the focus of the present study).

   Like counterfactual pattern 3 conditionals, counterfactual pattern 2 conditionals demonstrate a correlation between counterfactuality and past tense. However, in contrast to pattern 3 conditionals, pattern 2 conditionals are

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[2] Declerck and Reed (2001) claim that (taken together), the three canonical patterns yield at least 36 different interpretations.

morphologically simpler. Therefore, it would seem that counterfactual pattern 2 conditionals are the more natural choice for introducing students to counterfactual conditionals in general.

Covert conditional clause. Declerck and Reed (2001) refer to conditional clauses which are not overtly expressed as "covert" and to conditionals which contain covert conditional clauses as "covert P-clauses" (pp. 376-377). For example:

(7) "They'd have destroyed me utterly." — "I really think they would, Mr. Tate."
(Declerck & Reed, p. 376)

Sentence (7) is not intelligible unless one understands the counterfactual circumstances that would have led to Mr. Tate's being destroyed (p. 376). For example, one could imagine a context in which the covert conditional clause for (7) is, "If I hadn't escaped the prison camp…"

Would {like / love / not mind}. The forms "would like to" and "would love to" are frequently used without overt conditionals.

(8) "Bill would like (to have) a moped."   (Declerck & Reed, p. 377)

Although sentences containing "would like to" or "would love to" or "wouldn't mind" do not always have a recoverable covert conditional (p. 377), sometimes they do. For example, the covert conditional for an example like (8) could be something like, "If it were possible…" Therefore, one could argue that examples like (8) are counterfactual conditionals with covert P-clauses.

Meaning.

Following Declerck and Reed (2001), throughout this paper I have used the term "counterfactual" to describe propositions which the speaker believes to be untrue. For contrast, note that "counterfactual" propositions are distinct from "tentative" propositions

(propositions whose truth the speaker considers unlikely) and from "open" propositions (propositions whose truth is unknown to the speaker) (Declerck & Reed, 2001).

Moreover, I use the term "counterfactual conditional" as a shorthand for conditionals in which the P-clause is counterfactual.[3]

Relationship between Form and Meaning.

By using the term "counterfactual second conditionals," I do not mean to suggest that second conditionals will necessarily license counterfactual readings, nor that counterfactuality must necessarily be expressed using a second conditional. If either of these claims were true (which they are not), then it would suffice to refer to such conditionals either as "counterfactual conditionals" or as "second conditionals."

On the contrary, I use the expanded term "counterfactual second conditionals," precisely because counterfactual second conditionals lie at the intersection of form and meaning and because neither its form nor its meaning necessitates the other. The term refers, quite simply, to those second conditionals which do happen to license counterfactual readings.

But this raises 2 questions:

1. When do grammatical second conditionals license counterfactual readings?
2. What factors affect whether a speaker opts to express a counterfactual conditional with a second conditional?

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[3] Note that when a P-clause is counterfactual, it does not necessitate that the corresponding Q-clause also be counterfactual (although it often is). For example, consider:

"Even if you had written, I would still have been able to save you."

(Declerck & Reed, p. 250)

In contrast to a prototypical conditional, the Q in this example does not follow from the P, but rather, occurs *in spite* of P. Moreover, the word "still" indicates that that the speaker did in fact save the hearer, i.e. that Q is not counterfactual. Declerck and Reed (2001) refer to such Q-clauses as "imaginary."

The first question is actually answered for us by Declerck and Reed:

"As a rule, a pattern 2 conditional is counterfactual-P if the P-clause is interpreted as referring to present rather than post-present actualization. This is the case when the P-situation is represented as homogeneous. (A situation is homogeneous if is 'the same all the way through' [Galton 1984: 154] …) In other words, if a pattern 2 P-clause refers to a state or to a general or habitual situation, or if it uses a progressive verb form, it normally receives a present actualization interpretation."   (p. 239)

Moreover, Declerck and Reed go on to point out that the counterfactual reading is only an implicature and as such can be cancelled by a future time adverbial (p. 240). Consider:

(9) "If I were (suddenly) rich (tomorrow), I wouldn't have to work.
(Declerck & Reed, p. 240)

If the future time adverbials are omitted, sentence (9) licenses a present, counterfactual reading.

In other words, to determine whether a pattern 2 conditional is counterfactual, one must consider all of the following:

- the lexical aspect of the verb phrase (homogenous or not)
- the grammatical aspect of the verb phrase (progressive or not)
- time reference (future or not)

Returning to the two questions above, the second asks us to determine when a speaker will opt to express a counterfactual conditional with a second conditional. The importance of this question becomes apparent when we observe that a counterfactual conditional need not be expressed with the past tense. Consider the following example taken from the popular TV series *Heroes*. In this scene, the character Hiro, who has the ability to control time, is introducing himself to the character Daphne, who has the ability to move at great speed. Hiro has just stopped time (or so he believes), and as a result, everything and everyone have become motionless (except for Hiro and Daphne).

> (10) a. Hiro:　　… I'm Hiro Nakamura. I stop time.
> 　　　　 Daphne: I got news. You don't stop it completely, *or we're not having this*
> 　　　　　　　 *conversation* [emphasis added]. 　　　　　　　　 (Kring, 2006)

The "or" in Daphne's utterance implicates exclusive disjunction, meaning that Daphne's utterance implies:

> (10) b. If you stop time completely, we're not having this conversation.

So, logically speaking, Daphne has expressed a counterfactual condition, and as such, she could have marked its counterfactuality with the past tense:

> (10) c. If you stopped time completely, we wouldn't be having this conversation.

But why didn't she? In other words, what is the difference in meaning between sentences like (10b) and (10c)? To answer this, we must have a clearer understanding of what the "present" and "past" tense actually do.

Despite the seeming banality of this question, the present/past tense contrast persists as one of the most misunderstood aspects of English grammar. The labels for the two verb forms ("present tense" and "past tense") frequently lead students (and inexperienced English teachers) to act on the misguided assumption that verb tense always indicates time reference in the same way that, say, singular/plural morphology always indicates number. Although this description of verb tense has an ounce of truth, it is not general enough.

As Michael Lewis (1986) points out, the most general *meaning* of "present" and "past" tense are, respectively, immediacy and remoteness[4], and although the "past" tense is indeed used to describe events or states that are remote in time (i.e. past), it can also indicate other types of remoteness. More specifically, the "past" tense can indicate *any* of the following:

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[4] Michael Lewis even goes a step further and proposes that the terms "present tense" and "past tense" should be completely abandoned and replaced by "immediate verb form" and "remote verb form." Although this proposal has some merit, for the sake of legibility, I have adopted the more traditional terminology in this paper.

- Time of event or state is perceived of as remote (remoteness of time)
- Event or state is unlikely (remoteness of possibility)
- Event or state is imaginary or definitely counterfactual (remoteness or reality)

In contrast, the "present" tense indicates *all* of the following:

- Time of event or state is perceived of as immediate (immediacy of time)
- Event or state not unlikely (immediacy of possibility)
- Event or state is real or potentially real (immediacy of reality)

Of these criteria the most relevant when dealing with counterfactual conditionals is remoteness (or immediacy) of reality.

So, returning to sentence (10a), we see that Daphne, by using the present tense in the last part of her utterance, has indicated that it is potentially true that she and Hiro are *not* having a conversation. This may seem strange considering that she herself is participating in that very conversation! So, why does Daphne's utterance not strike us as ungrammatical?

Declerck and Reed provide one possible answer. In such examples, by using the present tense, the speaker pretends to entertain the possibility that P might be true, but then makes it clear in Q that this assumption must be reconsidered (Declerck & Reed, 2001, p. 153). The purpose of such a technique would be for the speaker (either consciously or unconsciously) to bypass the hearer's affective filter by postponing disagreement until the second half of the utterance. In other words, the reason that Daphne's utterance does not strike us as ungrammatical is because it occurs in a context where the hearer (Hiro) is presented with a P-clause whose counterfactuality he may be reluctant to accept.

Characterizing Counterfactual Second Conditionals

Now that the linguistic focus of this study, "counterfactual second conditionals," has been defined, we will proceed by identifying the contexts in which it arises. As will

be seen later, the contextual factors which give rise to the target language will have direct bearing on task design. We will begin our analysis by considering which communicative functions are performed by counterfactual second conditionals.

Communicative function.

John Austin, in 1955[5], referred to what, up until that point, must have been a fairly common approach to philosophical (and linguistic) inquiry: "…many traditional philosophical perplexities have arisen through a mistake – the mistake of taking as straightforward *statements of fact* [emphasis added] utterances which are… intended as something quite different." (Austin, 1962, p. 3) Elsewhere, he identifies his work with "the recent movement towards questioning an age-old assumption in philosophy – the assumption that to say something… is always and simply to *state* something" (p. 12). The point Austin was making here and elsewhere is that adopting the perspective that utterances can be completely characterized as "statements of fact" (i.e. propositions) offers a very impoverished view of what language actually does.

The broader perspective which Austin advocated was to think of utterances not only in terms of their meanings, but also in terms of their functions[6], a fact exemplified by the very title of his lecture series: *How to Do Things with Words*. However, he also recognized that this perspective required further specification, since utterances have not one, but rather many functions, including (but not necessarily limited to) the following acts: "locutionary acts" (which deal with sense and reference), "perlocutionary acts" (explained below), and "illocutionary acts" (explained below).

Perlocutionary acts. Austin defines perlocutionary acts as follows:

"*Saying something* [emphasis added] will often, or even normally, *produce certain consequential effects upon the feelings, thoughts or actions of the audience, or of the speaker, or of other persons* [emphasis added]: and it [i.e. the act of saying] may be *done with the design, intention or*

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[5] Though Austin gave these lectures in 1955, as part of the William James Lectures, they were first published posthumously in 1962.
[6] Austin (1962) himself uses the term "function" only sparingly, preferring the term "use."

purpose of producing them [emphasis added]; ... We shall call the performance of an act of this kind the performance of a *perlocutionary act or perlocution* [emphasis added]*."* (p. 101)

Formulating Perlocutionary Acts. By distilling the above definition into a set of criteria, we can specify that the wording of a perlocutionary act must be such that…

1. …it begins with a verb (since it is an "act")
2. …the speaker is the agent of the verb (since it is the speaker that commits the act of "saying something")
3. …the act can be said to have been completed iff it successfully produces certain consequential effects upon the feelings, thoughts or actions of the audience, or of the speaker, or of other persons.
4. …the act is intentional.

Examples. To convince someone, to get someone to abandon a request

Pedagogical Implication. When defining a particular linguistic structure (e.g., counterfactual second conditionals), it is pedagogically informative to identify the perlocutionary act(s) it can perform. Not only will this provide a means for articulating to learners how linguistic forms can be used to do things in the real world, but it can also inform task design.[7]

Illocutionary acts. Before defining "illocutionary act," the concept which is the central theme of his entire lecture series, Austin (1962) introduces the related concept of the "performative verb."

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[7] Note: Austin's (1962) own interest in perlocutionary acts (and locutionary acts too, for that matter) was as a tool for clarifying (via contrast) what illocutionary acts are.

Performative verbs. Austin defines a performative verb as a verb which can occur in an utterance such that…

1. …the verb is in the first person singular present indicative active (p. 61).

2. …the verb, "on grounds of vocabulary," can "*mak(e) explicit* what precise action it is that is being performed by the issuing of the utterance." (p. 61)

Examples. "to promise" as in "I promise to help." or "to pronounce" as in "I pronounce you guilty."

Definition of illocutionary acts. Austin (1962) introduces the notion of "illocutionary acts." Although he does not provide a complete, formal definition[8] of "illocutionary acts," he does provide the basis of one:

An utterance x performs the *illocutionary act* y if in saying x, the speaker does y (or was doing y or did y)[9] (p. 122).

Example. The utterance "I will shoot you" performs the illocutionary act of threatening, because *in* saying. "I will shoot you" the speaker threatens the hearer (p. 122).

Corollary. For every utterance containing a performative verb, the corresponding illocutionary act can be "made explicit" using precisely the same performative verb (p. 132). (see performative verb examples above)

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[8] Austin explains "illocutionary acts" using examples, by contrasting it with other types of acts (viz. l, by as well as to the associated notion of "performative verbs," and by using a variety of tests, but never provides a complete, formal definition.

[9] At the end of this lecture, Austin concludes that formulae such as these "are at best very slippery tests for deciding whether an expression is an illocution as distinct from a perlocution or neither." (pp. 131-132)

Formulating illocutionary acts. Elsewhere, Austin suggests a way of capitalizing on the above corollary:

> "…what we should feel tempted to say is that any utterance which is in fact a performative should be reducible, or expandible, or analyzable into a form, or reproducible in a form, with a verb in the first person singular present indicative active (grammatical)." (pp. 61-62)

In other words, if a given utterance x can be paraphrased using some performative verb y, then the corresponding illocutionary act can be "made explicit" by using y[10]. However, Austin cautions us that *only* attending to grammar (i.e. only applying the first part of the above definition of "performative verb") can cause us to mis-label as performative verbs some verbs which are not (pp. 62-66). To illustrate, I provide the following examples:

(11) I refuse to listen to any more of your whining.
(12) I refuse your requests when you ask me to do something unreasonable.

It is easy to imagine a context where, in saying sentence (11), the speaker refuses to listen to someone's whining, i.e. a context where the very utterance of (11) would function as the refusal. However, it is not possible to imagine a context in which, in saying (12), the speaker would be refusing. This example illustrates how the "in saying x, the speaker was doing y" test provides us with a tool which, when coupled with the paraphrasing strategy, allows us to identify illocutionary acts (while at the same time heeding Austin's words of caution).

Pedagogical Implication. Illocutionary acts, like perlocutionary acts, provide a means for articulating to learners how linguistic forms can be used to do things in the real world.

Also, the successful completion of an illocutionary act does not in any way depend on successful completion of a perlocutionary act. For instance, as Austin

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[10] Paraphrasing using a performative is not always possible, because some illocutionary acts (e.g. "to insult") can not be expressed using a performative verb.

points out, one can successfully complete the illocutionary act of arguing without necessarily achieving the perlocutionary effect of convincing the hearer (pp. 103-104). In other words, speakers have more control over their illocutionary acts than they do over their perlocutionary acts, making the former the natural choice for describing task objectives, i.e. what constitutes successful completion of a task.

When an illocutionary act is correlated with one or more linguistic forms, tasks can be created which have both a linguistic and non-linguistic objective. However, such tasks are subject to criticism on the grounds that form and function cannot be placed in strict one-to-one correspondence. This criticism is addressed below in the section "Form-focused Tasks."

Communicative functions of counterfactual conditionals. Consider the following examples provided by Declerck and Reed (2001):

(13) a. "If your father were alive today, he would be very proud of you."
                                                                                  (p. 271)

       b. "If I were you, I'd complain to the manager."   (p. 272)

       c. "If my mother-in-law was coming tomorrow, I would be busy cleaning
            the house from top to bottom."   (p. 301)

Declerck and Reed (2001) use the above examples (13a-c) to illustrate some of the illocutionary acts[11] which counterfactual P-conditionals can perform (compare (13a-c) and (14a-c)):

(14) a. Giving approval (by expressing the disposition of someone who is not
            present or not living)   (p. 271)

       b. Giving advice (by expressing one's own disposition)
                                                                          (pp. 272-273)

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[11] Declerck and Reed use the term "communicative function," not "illocutionary act."

     c. Providing evidence that a proposition is true (by leading the hearer to reason that P must be counterfactual by showing that it leads to a counterfactual Q)   (pp. 296-302)[12]

In addition, there is an illocutionary act which can be performed by counterfactual conditionals with covert P-clause; it accompanies refusals. Consider:

(15) a. "I really wouldn't mind helping you, but I have a big exam coming up. I was planning on studying all Saturday for it."
             (Liao & Bresnahan, 1996, p. 707)

In terms of structure, the first clause of (15) has the form of a conditional Q-clause. Moreover, although it is not overtly expressed, the following covert counterfactual P-clause can be recovered from context: "If I were able to help you…"

The speaker in example (15a) has just been asked for help with moving and is refusing this request by providing a reason. However, the only part of (15a) which is absolutely essential for performing the refusal is the reason (the upcoming exam). In other words, the first clause ("I really wouldn't mind helping you, …") does not itself contribute to the refusal. Rather, it performs the following illocutionary act:

(15) b. Showing a willingness but inability to help   (p. 718)

Testing

The development of a test should involve not only the creation of the test items themselves, but also "test specs," i.e. specifications which include (at a minimum) a general description (Davidson & Lynch, 2002, p. 21) and a sample item (p. 26). Incorporating such test specs into test development creates "iterative, consensus-based, specification-driven testing" (p. 7). The term "specification-driven" is used, because by defining the purpose and characteristics of a test, evaluating a new test item becomes a matter of insuring that it "fit[s] to spec[ifcations]" (Fulcher and Davidson,

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[12]This type of reasoning is what logicians would refer to as "reduction ad absurdum" and what mathematicians would refer to as "proof-by-contradiction." It relies on a "modus tollens" inference (Declerck & Reed, p. 297).

2007, pp. 55-56), i.e. that it is in "congruence" with its stated objectives (ibid.). The terms "iterative" and "consensus-based" are used, because having test specifications made explicit makes it possible for stakeholders to discuss (and potentially revise) test items and/or the test specs themselves.

Purpose of Testing

Davidson and Lynch (2002) note that "the best and first place to understand a test is to ask: 'What is its purpose?' What function(s) does it serve?" (p. 131)

The purpose of the testing instrument in the present study is to measure the effectiveness of instruction for productive use of counterfactual second conditionals, i.e. to measure the extent to which instruction using (still-to-be-developed) pedagogical materials can be positively correlated with increased student proficiency. In simpler terms, the study deals with the development of test items which can determine whether learners who are *not* proficient at using counterfactual second conditionals *prior to* instruction are proficient at using them *after* instruction.

Norm. vs. Criterion-referenced Measurement. If one of the purposes of a test is to rank test-takers in order to make relative decisions, we will need to develop a test which involves norm-referenced assessment (Davidson & Lynch, p. 9). Alternatively, if one of the purposes of the test is to make an absolute decision about test-takers, we will need to develop a criterion-referenced test (p. 9). Also, these two types of measurement are not mutually exclusive; i.e. it is quite possible that a test could have a purpose which shares features of both types of measurement. So, which type of measurement best characterizes the purpose of the present study?

By measuring students' proficiency both before and after instruction, inferences can be drawn which allow us to evaluate whether instructional materials should or should not be used in a pedagogical setting. Since this is an absolute decision, the evaluative criteria of the results should be *criterion-referenced*.

However, an attempt will also be made to calibrate test items so as to elicit counterfactual second conditionals from the maximum number of native speakers

possible. In other words, viewed from another perspective, the test items will be *norm-referenced.*

Test Construct

In order to insure that test results can be meaningfully interpreted, the test construct must be precisely defined (Cronbach and Meehl, 1955). As previously mentioned, the construct for the present study is, broadly speaking, the effectiveness of instruction for productive use of a particular grammatical structure. However, operationalizing this construct is less than straightforward.

In order to measure spontaneous language production, test items will be designed to *elicit* the target structure from a significant number of native speakers. To this end, the present study utilizes task-based test items (discussed in next section), i.e. activities which involve not only linguistic, but also non-linguistic objectives. Moreover, these tasks are intended to be such that fulfillment of the linguistic objectives is dependent on (but not necessarily required by) fulfillment of the non-linguistic ones. Since the test items will be piloted on and normalized against native speakers, there are at least two potential difficulties.

First, it is conceivable that a significant number of native-speaker test-takers might achieve the non-linguistic objectives of a particular task, but fail to achieve the linguistic objectives. This would mean that test items are failing to elicit the target structure and could not be used to draw meaningful inferences about the effectiveness of instruction.

Second, it is also conceivable that native-speaker test-takers might fail to achieve the linguistic objectives of a particular task, but also fail to achieve the non-linguistic objectives. This would mean that completion of test items requires a construct-irrelevant, non-linguistic skill (e.g., logical reasoning aptitude) and that the test items are failing to directly address the construct of linguistic proficiency.

Therefore, to insure that test items measure the effectiveness of instruction for productive use of counterfactual second conditionals, test items must be designed so that a significant majority of native-speakers can achieve both the non-linguistic and

linguistic objectives of the tasks. Since this involves elicitation (which can be quite unpredictable) fitting test items to specs will potentially involve several iterations of actual piloting.

Prototyping and Reverse Engineering

Incorporating precise test specifications into test design can streamline the production of new test items. Nevertheless, test design frequently begins with the creation (or discovery) of one or more sample items, which then function as templates for the creation of additional test items (Fulcher & Davidson, 2007, p. 77). Drawing on an idea from engineering, Fulcher and Davidson refer to the creation of such templates as "prototyping" (p. 77).

Once test designers have access to such "templates," these items can undergo "reverse-engineering," which Fulcher and Davidson define as "an analytical process of test creation that begins with an actual test question and infers the guiding language that drives it, such that equivalent items can be generated" (p. 57).

Task-based Testing

Definition of "Task."

Tasks have become a staple of both language teaching and testing. Although the term "task" is potentially problematic in that there is no uniformly accepted definition, many of the most widely accepted definitions share certain commonalities.

Ellis (2003), in a survey of 9 definitions drawn from research and pedagogic literature, notes that the majority of the definitions of "task" refer to activities that "call for primarily meaning-focused language use" (p. 3) and that "result in some clear outcome, other than simply the use of language" (p. 8). Although he further refines the notion of "task," the preceding 2 criteria are sufficient for present purposes.

Summarizing, by "task," I refer to activities which:

- …have an objective which can be stated in non-linguistic terms
- …may also have an objective which can be stated in linguistic terms

Form-focused Tasks

A form-focused task is a task which has both a linguistic and a non-linguistic objective. But how does one design such tasks? In grammar instruction, one time-tested technique for teaching/testing form-meaning connections is *elicitation*.

However, this approach is subject to criticism on the grounds that the form and function of language cannot be neatly place in one-to-one correspondence. Moreover, it is difficult to determine in advance which linguistic forms are likely to occur for a given task. So, to what extent are such difficulties surmountable?

To answer this question, I draw on Loschky and Bley-Vroman's (1993) notion of "task naturalness." For a given task and a given grammatical structure, if the task "lends itself, in some natural way, to the frequent use of the structure," we say that the structure is "natural to the particular task" (Loschcky & Bley-Vroman, 1993, p. 132). Moreover, "task naturalness" is associated with an empirical methodology, since Loshcky and Bley-Vroman (1993) advocate determining "task-naturalness" by administering tasks to native speakers and observing which structures actually arise (p. 135).

Not only does such a methodology allow us to make objective claims about how a given structure is actually used, but it also provides a litmus test for determining whether an elicitation task will achieve its intended objectives. In testing terms, "task-naturalness" provides a means of evaluating the "congruence" between test items and stated task objectives.

Another potential drawback of a task whose express purpose is the production of a particular grammatical structure is that it is possible to inadvertently create a task which lacks a meaningful *non-linguistic* objective. However, this can be avoided if task designers are disciplined about explicitly stating task objectives and about evaluating congruence between test items and objectives. And (as mentioned earlier) one method for formulating such objectives is to determine and state the illocutionary act being performed by the target structure.

Mode of Tasks

In designing a task, the question arises as to what the optimal means of data elicitation is. As Kasper and Dahl (1991) point out, the types of data collection used for pragmatics research ranges in the degree of control it imposes on the data. The types of data collection instruments used to investigate productive language use (ordered from freer to more controlled) include: 1) observation of authentic discourse, 2) interactive oral role-plays, 3) non-interactive oral role-plays, 4) discourse completion (p. 217). Each data elicitation method has its own advantages and disadvantages, and its appropriateness will depend on consideration of such factors as the types of inferences to be drawn and the practicality of its use.

Authentic discourse, commonly accepted as the gold-standard in pragmatics research does not afford the researcher situational control, and this is potentially disadvantageous, since it is well-established that situational factors strongly influence speech act performance (Beebe & Cummings, 1995, p. 80). Also, it is very difficult to observe certain speech acts (e.g., authentic refusals). Therefore, if they approximate authentic discourse sufficiently, other types of data elicitation are preferable, since they enable the research to manipulate situational variables as well as to create replicable data elicitation instruments.

At the other end of the controlled-free spectrum, we have so-called DCT's (discourse completion tests). Since DCT's do not require transcription, the researcher is able to gather a large amount of data quickly (p. 80). Transcription time is no trivial matter, since by contrast, recorded speech, even for expert transcribers, involves an estimated 10 to 1 ratio of transcription time to recording time (Kasper & Dahl, 1991, p. 229).

On the other hand, DCT's unfortunately seem to yield the least authentic data of all the elicitation methods. By design, DCT's cannot elicit data which involves multiple moves (nor can, for that matter, non-interactive role-plays). Beebe and Cummings' (1995) comparison of authentic refusals with DCT-elicited refusals strongly suggests that these two types of data differ in terms of, for example, actual wording used in real interaction (relevant if one is attempting to elicit a given grammatical structure), the

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range of strategies used (e.g., hedging), length of response, and depth of emotion (p. 80).

However, their study also suggests that DCT's are effective at tapping into participants' knowledge of the stereotypical requirements of a socially appropriate response as well as what participants imagine the canonical shape of speech acts to be (Beebe & Cummins, 1995, p. 80). For this reason, Beebe and Cummings endorse using DCT's for creating an initial classification of semantic formulas.

Finally, we consider interactive role-plays. In contrast to authentic data, interactive role-plays are replicable and allow for the manipulation of situational variables (Kaspar & Dahl, 1991, p. 229). In contrast to both DCT's and non-interactive role-plays, interactive role-plays create the potential for multiple moves, and since they involve another interlocutor, it seems intuitively feasible that interactive role-plays would be more effective at tapping into depth of emotion and eliciting more elaborated speech.

However, Dahl's own doctoral research, which involved interactive dyadic role-plays of refusals between herself and several hundred NS English participants, suggested that interactive role-plays and naturally-occurring role-plays differ both in amount of talk and directness (as cited in Kasper and Dahl, 1991, p. 243). However, as Dahl herself points out, the data collection procedure itself calls into question the generalizability of these findings. Specifically, Dahl would ask a participant, "Would you like to do a small role play with me?" If the participant agreed, the role-play was enacted immediately, and as Dahl herself points out, this required participants to perform a speech act (refusing a request) diametrically opposed to the one they just performed (granting a request) (p. 244). Kasper and Dahl conclude by speculating that simulations in which participants retain their own identities might be more effective at approximating authentic data (p. 245).

One way of enhancing the potential effectiveness of interactive role-plays is by acknowledging that role-play is a form of acting and to draw on some basic acting techniques. For example, in the method acting tradition, in order to more accurately portray their roles, actors are encouraged to employ relaxation techniques, to carefully consider the motives and back stories of their role, and to draw on emotional memory (a

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technique attributed to Lee Strasberg) (Krasner, 2000). Granted, it would be impractical to provide learners with extensive training in acting prior to task performance. However, basic acting principles could potentially be incorporated into the instructions for the task. Also, to a limited degree, such principles could even inform task design itself in the sense that situational factors could be manipulated in order to render each role's motives more plausible.

Chapter 3: Methods

Restatement of Purpose

This study represents the first step of a long-term project to create instructional materials to teach productive use of second conditionals to non-native speakers of English. In order to test the effectiveness of the still-to-be-developed instructional materials, test items for a still-to-be-conducted pre-, post-, delayed study needed to be developed. To that end, the researcher attempted to design tasks which would "elicit" the target structure from proficient speakers of English.

Research Questions

For this study, tasks were sought out which were already known to elicit counterfactual second conditionals. These tasks were to be used as prototypes for the development of additional test items which were to be used in a pre-, post-, delayed study to measure the effectiveness of grammar instruction. Since creating additional test items and the corresponding test specifications required reverse engineering the prototype tasks, the first research question for this study was:

RQ1: What characteristics of tasks would be sufficient to elicit counterfactual second conditionals?

The potential value of these test items lies in determining whether participants will transfer their grammatical knowledge to real-world contexts. To determine this, ideally one would conduct a longitudinal study in which naturally-occurring data is collected from participants. However, for the purposes of the present study, a longitudinal study was not feasible. Therefore, a second research question was also posed:

RQ2: To what extent is there consensus that test results can be used to draw inferences about transfer of learning to real-world situations?

Participants

The participants for this study were two groups of 20 adult native speakers of English. All participants held a bachelor's degree or higher.

In the first round of testing, 20 participants were given two sets of tasks: 1) four role-plays in which one participant made a request and the other participant refused that request, and 2) three written logic puzzles. Afterwards, participants provided feedback on the tasks by completing a written questionnaire. None of the tasks had a time limit, but testing typically lasted about one hour.

In the second round of testing, 20 participants were given one set of tasks: four logic puzzles. Afterwards, these participants too provided feedback on the tasks by completing a written questionnaire. None of the tasks had a time limit, but testing typically lasted about 45 minutes.

The refusal role-plays were administered to dyads (20 participants = 10 dyads). The logic puzzles and the questionnaire were completed individually.

Dyads who identified their relationship as "intimate" were not allowed to participate.

For the refusal role-plays, no participants were involved in both rounds of testing.

Elicitation and Task Naturalness

Broadly speaking, the researcher attempted to design test items which were meaning-focused and which would *elicit counterfactual second conditionals*. Here, successful elicitation is defined simply as whether a participant's data gets coded as a counterfactual conditional (see "Coding Data" below).

Moreover, the researcher attempted to design test items for which production of counterfactual second conditionals is *natural to the task*. Although the researcher felt that "task naturalness" should require successful elicitation from more than 50% of native speakers, he also felt that a narrow majority would not be sufficient evidence of task naturalness. On the other hand, since it is highly unlikely that a meaning-focused task will ever elicit a particular target structure from *all* native speakers, the researcher felt that "task naturalness" should not require successful elicitation from 100% of native-

speaker participants. Therefore, task naturalness was defined somewhat loosely as successful elicitation from a "significant majority."

General Description and Sample Items

Following the advice of Davidson and Lynch (2002), the researcher created "test specs" (See Appendix H) which included a general description (p. 21) and a sample item (p. 26). Then, these specs were further developed over a series of iterations.

Broadly speaking, the core criteria of the test items did not change very dramatically as the test evolved and can be stated succinctly as:

Test items should be tasks which:

- …are meaning-focused
- …elicit counterfactual second conditionals from a "significant majority" of NS's

Although additional criteria were later added, they typically represented an attempt to satisfy the above-stated core criteria.

Test Development Cycle

Test specs for this project were developed using a test development cycle which I describe in the following paragraphs.

The first step of the test development cycle is to find or create tasks which can potentially serve as sample items. In the early cycle(s) of test development, the test designer seeks out tasks which are already known to elicit the target language from at least *some* NS's (see "Description of Prototype Tasks" below). Later, when the test specs become generative, the test designer can create tasks.

Then, the test designer evaluates these items (see "Analysis of Task Factors" below) and attempts to anticipate whether counterfactual second conditionals are *natural to the tasks*, i.e. whether tasks will elicit counterfactual second conditionals from a *significant majority* of NS's. To better make this determination, informal feedback is

collected from friends and colleagues. This anticipatory step is incorporated into the test development procedure in order to avoid fruitless piloting.

If this evaluation seems to indicate that tasks have features which might decrease the likelihood of elicitation, the test designer incorporates new task factors into the general description and into the sample items.

After the test designer feels that test items can potentially elicit counterfactual second conditionals from a *significant majority* of NS's, he pilots them with a group of native speakers.

If the results of the pilot suggest that counterfactual second conditionals are *natural to a task*, that task is added to the test item bank. Otherwise, that item is re-evaluated and again goes through the above test development procedure. This procedure is represented schematically in Diagram 1 below.
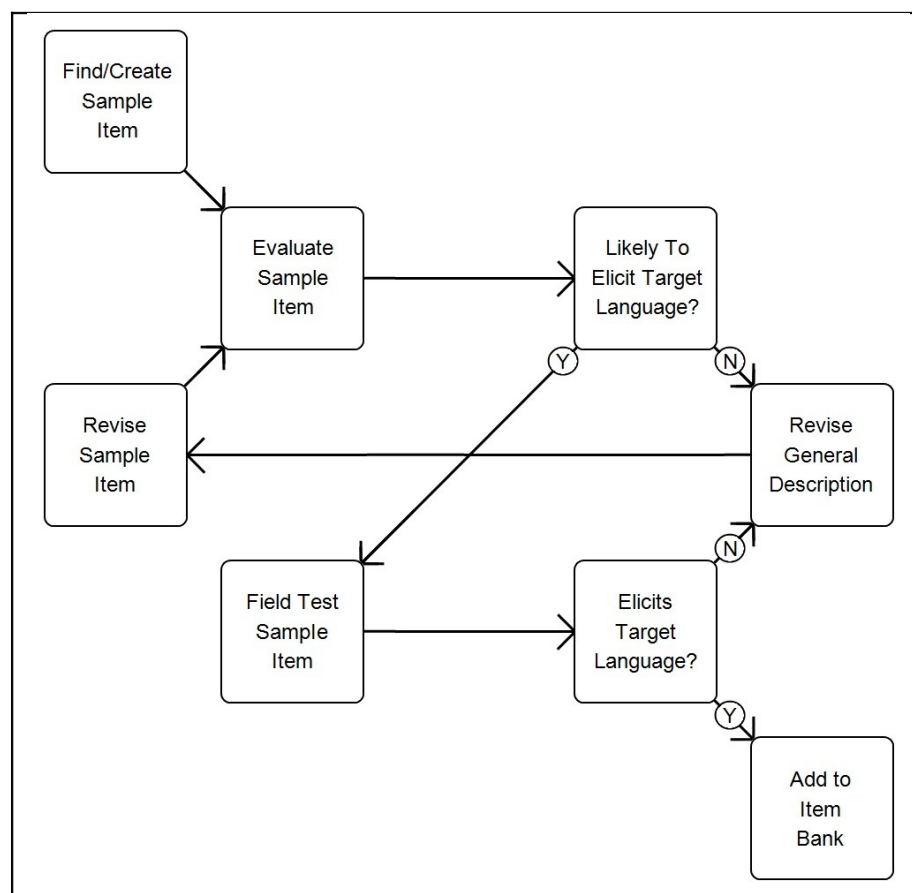

Diagram 1. Test Development Cycle

Each *iteration* of the test specs involves a revision of the general description and/or the sample item(s) (depicted in Diagram 1 as movement from the far right square to the far left square). On the other hand, each *cycle* of test item creation (depicted as movement from the upper-left square to the bottom-right square) may include one or more (or no) iterations of the test specs. Over time, it is reasonable to expect that the number of test spec iterations per test creation cycle will approach zero.

Description of Prototype Tasks

The starting point for the study was to find tasks which were already known to elicit counterfactual second conditionals, at least in some contexts.

Task Type 1 - Refusal Role Plays.

Liao & Bresnahan (1996) analyzed 4 types of refusals and found that refusals of requests were often prefaced by "would" phrases. In their study, American participants were provided with six written prompts (more precisely, six discourse completion tasks) and were asked to choose and provide a written response to one of those prompts. Each prompt described a hypothetical scenario in which a refusal would be natural.

One prompt was a scenario involving a request which was designed to be perceived as resulting in a time conflict:

(16) "Your longtime friend asks for your help in moving. You have an important exam coming up. What would you say?"   (p. 707)

Although the scenario described in (16) was designed to elicit refusals, it was (relative to the other five scenarios) relatively ineffective. Of the participants that responded to this prompt, only 14.13% (13 of 92) totally refused to help their friend move. The majority of participants (61 of 92) offered to help part of the time (p. 717). One plausible explanation for the relatively low number of refusals is that participants may not have perceived this scenario as involving a genuine time conflict.

On the other hand, of the 13 refusals which *were* elicited by this prompt, 53.85% (7 participants) used some form of "I would…" (p. 717). For example:

(17) "I really wouldn't mind helping you, but I have a big exam coming up. I was planning on studying all Saturday for it."   (p. 707)

In fact, of the six prompts used in Liao and Bresnahan's (1996) study, prompt (16) elicited the highest percentage of phrases containing "I would…" relative to the total number of refusals elicited.

The illocutionary act being performed in the first clause of (17) ("I really wouldn't mind helping you…") is showing a willingness but inability to help. In general, forms containing "I would…" (e.g., "I would like to…", "I would love to…", "I would but…") can be used to show a willingness to help. However, for the purpose of performing a refusal, an expression of willingness is (in some sense) superfluous, because all that is required to clearly convey a refusal is the reason for that refusal. In other words, "would" phrases of this type seem to flout Grice's maxim of relation.

On the other hand, the expression of willingness represents an attempt to maintain solidarity with the hearer, because the speaker is claiming to want what the hearer wants. Its presence can be explained by the fact that a refusal is an example of a face-threatening-act, and by expressing a willingness to help, the speaker minimizes risk to the hearer's positive face.

The help-friend-move task in Liao and Bresnahan's study elicited very few outright refusals (only 14.13%). One possible explanation for this is that some participants may have been unable to imagine any possible motivation for refusing. For example, even though the role-play was designed to be perceived as involving a time conflict (helping your friend vs. studying for the test), some participants may have imagined there being enough time to do both things.

Since the objective of the task is for participants to produce refusals, the prompt could be altered so that it explicitly instructs participants to refuse the request. On the other hand, if a participant does not understand his or her motivation for refusing a request, there is a risk that the language used to perform the refusal will sound inauthentic. To counter this effect, details can be added to the prompt which make the time conflict more plausible.

Also, because the help-friend-move task was a DCT, it may have been effective at tapping into what participants imagine the canonical shape of a refusal to be. However, since the primary purpose of the present study is not the elicitation of refusals per se, but rather the elicitation of counterfactual conditionals, a role-play may be a more suitable for present needs. This is because Beebe and Cummings' (1995) comparison of task types suggests that a spoken role-play may be more effective at eliciting strategies other than the refusal itself. Moreover, role-plays provide stronger evidence than do DCT's that a given speaker will transfer grammatical knowledge to real-world situations.

Task Type 2 - Logic Puzzles.

At the outset of this project, the researcher was aware that certain types of logical deduction puzzles have the potential to elicit counterfactual conditionals. Examples of such puzzles are in the 1982 classic *Challenge to Think* by Christine Frank, Mario Rinvolucri, and Marge Berer. Because the researcher had taught lessons using this book, he had experienced firsthand the potential of such tasks to elicit counterfactual conditionals.

For example, in one of the logic puzzles in *Challenge to Think*, there is a king which has taken 3 prisoners out to a field, blindfolded them, and tied them to poles (See Diagram 2). The king informs each of the prisoners that his pole is one of two colors (black or white) and that there are, in total, 3 white poles and 2 black poles.

Then, the king removes their blindfolds and explains that he will ask each prisoner the color of his own pole. If any of the prisoners answers correctly, then all will be set free. If none of the prisoners is able to answer correctly, then all three will return to prison for 10 years. If a prisoner answers incorrectly, then he will be shot. If a prisoner is unsure, he may answer, "I don't know."

Then, the king asks each prisoner (first prisoner X, then prisoner Y, and finally prisoner Z) the color of his own pole. The reader's task is to deduce what each prisoner's answer must have been. Based on the above information, the reader can
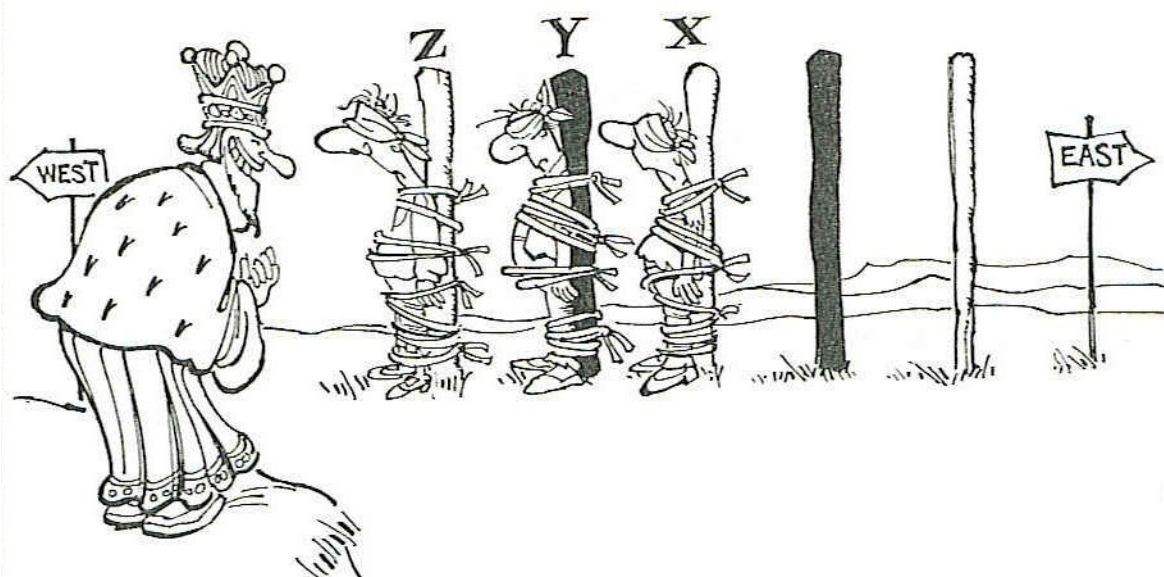
Diagram 2. Three Prisoners Puzzle (Frank et al, 1982, p. 52)

deduce that prisoner X and prisoner Y both must have said, "I don't know." Then, deductions like the following can be made:

(18) "If prisoner X had seen two black poles, he would have known that his own pole is white. Therefore, prisoner Z knows that prisoner X saw at least one white pole."

The illocutionary act being performed in the first sentence of (18) is providing evidence that a proposition is true, namely that prisoner Z had sufficient information to deduce that X had not seen two black poles. More specifically, (18) is an example of a proof-by-contradiction. In a proof-by-contradiction, the speaker wishes to demonstrate that a certain proposition is true. To do so, the speaker uses a counterfactual conditional (If P, then Q) which leads the hearer to reason that P must be counterfactual, because it leads to a Q which is already known to be counterfactual.

In the three prisoners puzzle, a proof-by-contradiction can be expressed in a natural way by using a counterfactual conditional. However, one drawback of the three prisoners puzzle is that, as demonstrated in example (18), it can easily give rise to *third* conditionals rather than *second* conditionals. Therefore, the researcher decided that this particular task would not be suitable for the present study.

Nevertheless, the puzzles in *Challenge to Think* inspired the researcher to broaden his search to include recreational puzzle books and magazines, such as *Games* magazine. This search yielded three potential puzzles which, with some modifications, the researcher believed might elicit counterfactual second conditionals.

Starting on the next page are the test specifications for task type 1 (refusal role plays), as they were written prior to the first and only pilot testing of refusal role-plays on native speakers[13], and the test specifications for task type 2 (logic puzzles), as they were written prior to the second and final pilot-testing on native speakers.[14]

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[13] Recall that the refusal role-plays were piloted only once during the first round of testing.

[14] Recall that the logic puzzles were piloted twice, once during each round of testing.

Test Specifications for Task Type 1: Refusal Role Plays

Illocutionary Act.

To indicate that one is willing to grant a request

Polite Act.

To minimize risk to hearer's positive face

Overview.

Tasks are oral role-plays involving 2 participants. One participant makes a request and the other participant refuses that request.

Target Language.

Counterfactual Second Conditionals

Examples of Target Language.

If I didn't already have plans, I would give you a ride.

If I knew how to help, I would.

I would lend you the money if I had it.

Specifications.[15]

- **R2 is Unable to Grant Request**
  - The situation is such that R2 is unable to grant the request, and the reason that R2 is unable to grant the request can be stated in the present tense (e.g., "I am busy.", "Her car doesn't have enough room.", "He lives too far away.")

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[15] P1 = participant #1 (the requester), P2 = participant #2 (the refuser),
R1 = role played by participant #1, R2 = role played by participant #2

       ○ R2 will be explicitly instructed to refuse the request. The purpose of this criterion is to help elicit the target language.

- **R2 is Unable to Offer Alternative Solutions**
  - ○ R2 cannot easily solve R1's problem any other way (aside from having R1 ask someone else). In addition, the request is time-sensitive; i.e. R2 cannot grant the request at a later time. These criteria are to increase the likelihood that R2 is unable to offer an alternative solution (e.g., granting the request at a later time).

- **R2 Has a Desire to Help**
  - ○ R2 has a desire to help R1, and R2 will be explicitly instructed that he/she has a desire to help R1. The purpose of this criterion is to help elicit the target language.

- **R1 Doesn't Know that R2 Feels a Social Obligation**
  - o Relative to the magnitude of the request, R1 and R2 are not close enough that a social obligation will be assumed. In other words, the situation and the relationship between R1 & R2 will be such that it will not obvious to R1 that R2 has a sincere desire to help (e.g., the prompt may specify that R1 & R2 have known each other only for a relatively short time). The purpose of this criterion is to increase the likelihood that R2 will feel a communicative need to express his/her desire to grant the request.

  - o Participants will be screened to insure that P1 & P2 do not have an intimate relationship in real life (e.g., family members). This criterion is to avoid the effect that participants' real-world relationship may have on the role play.

Procedure.

1) Prior to the session, randomly order the role plays.
2) Seat participants in a quiet room.
3) If there is a table, have participants sit perpendicular to each other. (Rationale: Having participants sit opposite one another could render the roles adversarial, and having them sit on the same side of table could render roles overly intimate.)
4) Tell participants, "I want you to feel comfortable during the role-plays, so please introduce yourself to each other."
5) Allow up to 5 minutes for participants to introduce themselves.
6) If they finish before 5 minutes have elapsed, say, "Okay, if you guys are ready, then we will proceed."
7) Randomly assign participants the letter A or B by having them blindly draw cards.
8) Tell them, "Leave your card turned face-up."
9) Test the recording device by turning it on, having each participant speak, and playing it back.

10) Read the following instructions to the participants:

You will participate in (number of role-plays) role-plays. For each role-play, I will give you a card. Your card has: your role, the other role, the situation, and your instructions (in other words, what you are supposed to do). Then, I will stand just outside the door. Please do not show your card to the other person, and please do not ask the other person what is on their card. If you do not understand something, you may ask me.

After you have read and understood your card, you may take some time to imagine the situation and get into your role. When you are ready to begin, please let me know. Then, I will enter the room, start the recorder, and leave the room again. When you are finished, call me, and I will enter the room.

Are there any questions so far? (Answer any questions they have)

Okay, so you will participate in (number of role-plays) role-plays. In other words, you will be acting. To act, it is important that you get into your role and imagine the situation. For some people this is difficult. For some it is very easy. Here are some tips to help you:

- *Think about your role's motivations. And if there is not enough information on the card to understand your motivations, then imagine the missing information. If you understand WHY you are doing something, it will feel more natural, and it will be easier to BE this person*

- *After you understand your role's motivations, as much as possible, try to think of a similar experience from your life. Then, try to REMEMBER this experience. To do this, you might find it helpful to close your eyes. To help you remember, ask yourself questions like, "Where were you?";*

"What were you doing at this time?"; "How did you feel?"; "What were you looking at?"; "What sounds did you hear?"

- *And as I said before, after you read your card, take as little or as much time as you like to imagine the situation and get into your role.*

  We will begin with a practice role-play (See Appendix A).

11) For the practice role-play (and each subsequent role-play), follow the instructions as outlined in the first 2 paragraphs of the above instructions.

Dealing with Questions.
- If a participant has a question about the procedure itself, answer the question directly.

- If a participant wants the proctor to clarify something which is unambiguously specified on the card (e.g., because they don't know a vocabulary word), answer the question directly.

- If a participant wants the proctor to clarify something which is not specified on the card or which is ambiguously specified (e.g., "How well do I know the person?"; "Can I ask the other person to reschedule?"), repeat the following instructions:

  Like I said in the instructions, think about your role's motivations. And if there is not enough information on the card to understand your motivations, then imagine the missing information.

Sample Items.
(See Appendix A)

Test Specifcations for Task Type 2: Logic Puzzles

Illocutionary Act.

To demonstrate that something is true/false by using proof-by-contradiction.

Overview.

Tasks are written prompts to be completed by 1 participant. Prompts are logic puzzles which require the participant to use counterfactual deductive reasoning to arrive at a solution.

Example of Target Language.

If the heat lamp was off, then Sherlock would know that light switch 3 controls it. Therefore, the heat lamp is on.

Specifications.

- **Requires Counterfactual Reasoning**
  - The puzzles will require participants to evaluate the truth of one or more key statements and explain why they are true/false. It will be possible to demonstrate that the key statements are true/false by employing "proof by contradiction," i.e. by first assuming that the statement has the opposite truth value, and then demonstrating that this leads to a contradiction.

  - Puzzles will be designed so that most (if not all) native speakers utilize "proof by contradiction" when solving the puzzle (as opposed to other types of deductive reasoning, such as syllogism). For recommendations on how to fulfill this criterion, see "Eliciting Counterfactual Reasoning" below.

  - Designing items that elicit counterfactual reasoning (as opposed to other deductive processes) can be quite challenging. Since it is more intuitive to

start the reasoning process by considering what is known than it is to start by entertaining counterfactual possibilities, it should not be expected that participants will, in general, employ counterfactual reasoning unless it is absolutely necessary to solve the problem (for an illustrative example of a puzzle that does *not* elicit counterfactual reasoning, refer to iteration 2 of "How much money is in the box?").

So, how exactly does one design a logic puzzle for which the "path of least resistance" involves counterfactual reasoning? Although it is difficult to provide a general answer to this question, there seem to be at least 2 commonly occurring genres of logic puzzles which achieve this goal. These are described below. This is not intended to be an exhaustive list, but it should serve as a useful starting point for the development of test items.

- **Not Too Difficult**
  - o Puzzles should be made relatively easy to solve (e.g., by providing hints, by providing the solution and asking for an explanation, by providing guiding questions which scaffold the task, etc.). Otherwise, there is a risk that performance will be affected by puzzle aptitude, rather than language ability.

Sub-specifications for Task Type 1: Information Gap[16]
- **The prompt describes a situation in which…**
  - o …there are a group of entities, each of which has 2 or more possible states (e.g., light switches which are off or on; hats which are red, green, or blue; boxes which contain 5¢, 10¢, or 15¢);

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[16] The examples cited here all refer to the puzzle, "How much money is in the box?"

- …there is a character (the asker) who will pose a question about the state of one or more of the objects;

- …there is at least one character (the answerer(s)) who knows the state of some (but not all) of the objects.

- **At least one answerer will be provided with information…**
  - …whose type is known to the test taker (e.g., the amount of money in Box A);

  - …whose specific value is not known to the test taker (e.g., the amount of money is known to the answerer but not to the test taker);

  - …which, were it to have (a) specific value(s), would allow the answerer (but not the test-taker) to deduce the required information (e.g., If Box A contained 5¢, then Sherlock would know the contents of each of the other boxes.);

  - …which is insufficient to answer the asker's question and which therefore results in the answerer's replying, "I don't know." thereby allowing the test-taker to deduce that the information received by the answerer is different from the specific value(s) mentioned in criteria 3.

- **The test-taker will be provided with information…**
  - … which is unknown to the answerer(s), or which the answerer(s) are not allowed to use, or which the answerer(s) are unwilling to use (e.g., the test taker learns the contents of Box B, but Sherlock does not).

  - …which, by itself, would be insufficient to answer the asker's question;

- …which, when combined with the information deduced from the answerer's replies, is sufficient to answer the asker's questions.

- **Creating an information gap between the "answerer" and the test-taker in this way encourages the test-taker to consider the situation from the answerer's point of view.**

Sub-specifications for Task Type 2: Liar Puzzles

- **True and false statements**
  - The prompt gives several statements and specifies that a certain number of them are false. The test taker must then deduce which of the statements are true. For an illustrative example, refer to the puzzle, "Where in the world are Ms. Englund, Ms. Finn, and Ms. Lux?"

- **Unique solution**
  - There is only one combination of true and false statements which has the appropriate number of true statements and which does not result in a contradiction.

Procedure.
1) Prior to the session, randomly order the logic puzzles. Then, place page with copy of instructions (See Appendix B) on top, and staple all pages together.
2) Seat participant in a quiet room.
3) Read the instructions out loud.
4) Leave participant alone and give them adequate time to complete puzzles.

Sample Items.

(See Appendix C)

Debriefing

      After a participant completed all the logic puzzles, the researcher told participants that the puzzles had been designed to elicit "proof-by-contradiction." Then, the researcher defined "proof-by-contradiction" to the participant and illustrated this concept by going through each puzzle with the participant and showing how it could be solved using proof-by-contradiction. When appropriate, participants' own responses were used as examples.

      Then, participants were asked to provide, in writing, suggestions for improving the puzzles as well as examples of when they use this mode of thought in real life.

Coding Data

      Identifying instances of counterfactual second conditionals requires one to analyze both form and meaning. How this analysis is to be performed is explained in the following sections.

      Form.

      Although test items were designed with the intention of eliciting counterfactual second conditionals, the researcher also anticipated the occurrence of other types of counterfactual conditionals (e.g., third conditionals or conditionals with different tenses in the P and Q clause). However, it was impossible to predict in advance how high the occurrence of conditionals other than second conditionals would be and what the significance of such conditionals would be.

      This had two implications for the coding of data. First, data was to be coded as either second conditional or not. Second, there was to be a post hoc analysis of data to determine whether and how other types of conditionals should be coded.

      Second conditionals were defined as sentences which satisfy the following criteria:

- The sentence has two clauses, one of which is a P-clause (i.e. a clause which is "introduced by *if* (possibly preceded by *only, even* or *except*) or by a

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word or phrase that has a meaning similar to *if, only if (*e.g., *provided*)"
(Declerck and Reed, 2001, p. 9)…

…OR…

…the sentence has one clause and a covert P-clause (i.e. a P-clause which is
not overtly expressed, but which can be recovered from context).

- (In the case that the P-clause is overt) The head verb of the P-clause is
one of the following: 1) a past tense verb or 2) "were" (including instances of
"were to" + base form of verb

- The head verb of the Q-clause is a past tense modal; i.e. it is one of the
following: 1) "would," 2) "should," 3) "could," 4) "might," or 5) the reduced form
"'d" (this includes phrases such as "I'd like to…," "I'd love to…," and "I
wouldn't mind…")

However, the researcher did not decide in advance what would constitute
evidence of a covert conditional and decided that this was to be determined by a post
hoc analysis. Moreover, since the status of covert conditionals and phrases such as "I'd
like to…" might be disputed, the researcher decided that such expressions should be
coded in such a way that one could distinguish them from other conditionals.

Meaning.

Although the counterfactuality of a conditional is strongly correlated with the form
of the head verbs in the P and Q clause, definitively determining the counterfactuality of
a conditional requires that one consider contextual factors (e.g., what is said before
and/or after the conditional). However, it was difficult to define in advance precisely
which contextual factors would constitute evidence of counterfactuality.

Therefore, although the researcher decided that data was to be coded as either counterfactual or not, the way to identify such counterfactuality was to be determined by a post hoc analysis.

Logic Puzzles. For the logic puzzles, the correctness of participants' responses is relevant, both for determining the difficulty level of logic puzzles and for interpreting whether participants' statements are in fact counterfactual. However, incomplete or partially correct answers would not necessarily preclude one from drawing inferences about the participant's knowledge of grammar.

Therefore, the researcher decided that the correctness of answers would be analyzed, but how this would be carried out was not determined in advance.

Moreover, it is conceivable that a participant could respond correctly to a puzzle, but without using proof-by-contradiction. Conversely, it is conceivable that a participant could use proof-by-contradiction to demonstrate something irrelevant.

Therefore, the researcher decided to code occurrences of proof-by-contradiction independent of whether this resulted in a correct response.

Refusal Role-plays. The refusal role-plays were designed to elicit expressions of willingness. Expressions of willingness are readily identifiable, because willingness is related to the literal meaning of an utterance. For instance, an expression of willingness can take a form such as "I'd like to…" or "I wish I could…"

Chapter 4: Results

Overview

In this section, I report the results of the final pilot of each of the two task types and of participant feedback regarding the logic puzzles. I begin with a discussion of several post hoc decisions made regarding how data was to be coded.

Coding Data

Coding Grammatical Form of Data.

To account for the full range of conditionals which were elicited, P and Q clauses were coded separately and were coded based on the form of the head verbs (provided head verbs were present). These head verbs were distinguished based on the following features: 1) present tense or past tense (or "were") and 2) modal or non-modal.

A clause which a participant abbreviated so that it included no verb was coded as "no verb." Covert P-clauses were coded as "covert." Also, covert clauses in the logic puzzles were made explicit by the researcher (See comments below).

As mentioned in the previous section, all second conditionals were coded in the data. Other canonical conditionals (0, 1st, and 3rd) were also coded. However, there were some conditionals which were difficult to categorize, namely those conditionals in which the P clause had no verb and, hence, no verb tense. This occurred when:

1) P was a noun phrase (either a gerund or a pronoun which refers to a previous clause).
2) P was embedded in the word "Otherwise…"
3) P was covert.

Prior to data collection, the researcher had already decided that counterfactual conditionals with covert P-clauses would be treated as canonical pattern conditionals. However, after a post hoc analysis of the data revealed other types of P-clauses with no

overt verb tense, the researcher decided to extend the method of classification for conditionals with covert P-clauses to conditionals with covert P-verbs.

The rationale for this decision was based on the observation that in conditionals with *overt* P- and Q-clauses, the tenses of the head verbs in each clause tended to match. Extending this concept, the researcher decided that, for the purpose of categorizing conditionals as zero, first, second, or third, those conditionals for which the P-clause had no verb tense would be treated as if the verb tenses of the P- and Q-clauses matched.

Coding Refusal Role-play Data.

Data elicited by the refusal role-plays was to be coded as either containing an expression of willingness in the expected environment or not, where "expected environment" meant accompanying a refusal. However, post hoc analysis of the refusal role-play data revealed that expressions of willingness also occurred near the end of role-plays. To be more precise, expressions of willingness occur in both of the following environments: 1) in the same turn as and preceding a refusal of a request and 2) in response to a turn in which the other speaker abandons the attempt to get help.

Identifying these environments was relevant for several reasons. Most importantly, it allowed the researcher to compare contexts in which expressions of willingness occurred and contexts where expressions of willingness *could have* occurred. Also, it allowed the researcher to be more economic in determining which data was relevant for the present study (See "Transcription" below). However, one challenge for coding the data was in determining what should constitute evidence of these environments.

In order to identify the first environment, requests and refusals needed to be labeled. However, refusals were problematic in that they were seldom done explicitly. Most commonly, refusals were performed by specifying the reason for refusal, as in this example from the "Can you help me move?" role-play:

(19) 1: "Well, I, I would love to help you out, but <u>I'm going camping. I'm actually on the road.</u>"

Therefore, not only explicit refusals, but also reasons for refusals were identified in the data.[17]

Next, an objective means was needed for identifying the second environment, i.e. for determining if and when abandoning the attempt to get help (AAGH) had occurred. Most commonly, the requester did this by explaining (or proposing) how they would deal with their problem, as in this example from the "Can you substitute for another teacher?" role-play:

> (20) 5: "Alrighty. Well, it was a good try. <u>I, I guess it looks like principal to the… (laughs) to the head of the class again.</u>"

On the other hand, there was also data where, although the requester provided no explanation for how they would deal with their problem, there was another form of evidence that they had abandoned the attempt to get help. These other forms of evidence included: 1) Expression of thanks, 2) Positive evaluation of the other speaker's refusal, 3) Expressing that the refusal was expected, 4) Expression of disappointment.

Data that did not fit any of the above mentioned categories was not coded as evidence of an AAGH. Granted, some expressions (e.g., "Alright.", "Okay.") can be used to accept a refusal. However, accepting a refusal does not necessarily indicate that the requester has completely abandoned their attempt to get help. In many instances, even though the requester accepts the initial refusal, they continue trying to get help by issuing an alternative request, such as a request to deal with the reason for the refusal or a downgraded request. Therefore, such expressions were not deemed to be an acceptable form of evidence that an AAGH had occurred.

As mentioned above, a requester's abandoning their attempt to get help was frequently followed by the other speaker's expressing their willingness to grant the request, but not always. In order to compare such expressions of willingness with the

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[17] In one instance, a participant (participant 5 in the "Can you help me move?" role-play) uttered something which could have been taken as a reason for refusal, but without intending for it to be taken as such. The evidence for this is that she later indicates that she did not initially realize there was a time conflict. Since there was no intention to refuse, this utterance was not coded as a reason for refusal.

other types of acts that occurred in response to AAGH's, all responses to AAGH's were coded. These included: 1) Expressions of guilt, 2) Expressions of Empathy, 3) Apologies, 4) Positive Evaluation of requester's alternative plan, 5) Alternative offer, 6) Wishing the requester good luck.

Transcription. Data from the refusal role-plays was either transcribed or summarized. For the sake of economy, only those portions of the role-plays deemed to be relevant to the study were transcribed or summarized. Generally speaking, turns where an expressions of willingness (EWG) occurred or could have occurred were transcribed, and turns which such data was a response to was either transcribed or summarized.

Initial requests were relevant, because they were frequently followed by an EWG + RTR sequence. However, their content tended to be very predictable, so in most cases, initial requests were summarized, rather than transcribed. Subsequent requests were less commonly followed by EWG's, so they were typically neither transcribed nor summarized. However, in those instances when a subsequent request was followed by an EWG + RTR sequence, the request was transcribed.

Turns in which an AAGH occurred were also relevant, because they were sometimes followed by an EWG. On the other hand, the AAGH is not, as far as the researcher is aware, a widely recognized category of discourse analysis. Therefore, to better illustrate this concept, the researcher transcribed all AAGH's.

When an AAGH did not occur, the dialogue was typically resolved in some other way (e.g., the other speaker offered to help in some other way). These other types of resolution were summarized, rather than transcribed.

Coding Logic Puzzle Data.

Data elicited using the logic puzzles was to be coded as either containing a proof-by-contradiction or not. Proof-by-contradiction involves three steps:

1) A statement of the form "If P, then Q"

2) A statement of the form "Q is not true."

3) A conclusion of the form "Therefore, P is not true."

Each test item was designed so that step 3 was either presupposed by the question itself or (in the case of the *Switches* puzzle) could be made explicit by providing a one-word response. Consider:

(21) "How do you know that Box A does not contain 5 cents?"

(22) "Based on Sherlock's answer, is the heat lamp off or on?"

For question (21) the statement to be proven ("Box A does not contain 5 cents.") is presupposed by the question itself. For question (22) the statement to be proven can be made explicit by providing the one-word answer "on." Also, each test item was designed so that the statement corresponding to step 2 was located somewhere in the prompt and could therefore be omitted.

In other words, provided the participant proved the statement which they were expected to, the only essential ingredient of a proof-by-contradiction was a counterfactual conditional (and in the case of the heat lamp puzzle, the one-word answer "on").

On the other hand, there were also instances where the participant (perhaps unintentionally) used a statement of the form "If P, then Q." for which the statement of the form "P is not true." did not correspond to the statement they were expected to prove. In such instances, the response was coded as a proof-by-contradiction if…

- …a statement equivalent to "Q is not true" was located somewhere in the prompt.
- …a statement equivalent to P is not true." (the statement to be proven) was made explicit by the test-taker.

Consider the following response:

> (23) 4: "If switch 3 controlled the lamp, then the light would be off in the room +
> he would know that 3 controls it. … 1 or 2 must control it."

This participant, rather than proving the statement which they were expected to ("The heat lamp is on.") has proven that switch 1 or switch 2 must control the lamp. Nevertheless, our two criteria above have been satisfied. First, a statement equivalent to "Q is not true" is located in the prompt ("…he [Sherlock] does not know which switch you turned on first."), and second, a statement corresponding to the negation of P has been made explicit ("1 or 2 must control it." is equivalent to "3 does not control it."). Therefore, this response was coded as a proof-by-contradiction.

Coding data in this way only assesses whether responses *contain* a proof-by-contradiction. It does not, however, assess whether responses are entirely correct. Consider:

> (24) 19: "… If Ms Lux is in England (1 = True), then 2 has to be false, [i.e. Ms.
> Lux is in Finland] which doesn't make sense. Similarly, if 2 = T [Ms. Lux
> is not in Finland], then 1 [Ms. Lux is not in England] has to be false,
> which also doesn't make sense. So Ms. Lux can't be the one in
> England." [Conclusion]

In this response to the *Robbers* puzzle, the participant is proving that Ms. Lux can't be the one in England. However, the participant's second sentence is incorrect; i.e. sentence 1 does not follow from sentence 2. Since it is conceivable that Ms. Lux could be in Luxembourg, it is not nonsensical for her to be neither in Finland nor England. However, by ignoring the participant's second sentence, we see that they have provided the relevant counterfactual conditional (in the first sentence) to prove the last sentence. Therefore, this response was coded as a proof-by-contradiction.

This may seem to be an overly lax interpretation of the data, and it would be, if the purpose of the test items was to assess participants' logical reasoning ability.

However, the test items are designed to assess participant's knowledge of the interplay between conditionals and counterfactuality.

Coding Covert P-clauses.

In the refusal role-plays, since the initial request was refused, every expression of willingness to grant that request which had the form of a past-tense modal had a recoverable counterfactual P-clause of the form "If I was/were able to…" In other words, all conditionals which were EWG's had covert P-clauses. To avoid redundancy, the P-clauses were not explicitly added by the researcher, but were coded simply as "P = covert."

In the data elicited by the logic puzzles, if a conditional had a covert P-clause, the researcher would first evaluate whether the response counted as a proof-by-contradiction using these criteria:

1) It was clear which statement the participant was attempting to prove.
2) Adding a P-clause corresponding to the negation of the sentence to be proven results in a complete proof-by-contradiction.

If the response was a proof-by-contradiction, the researcher would interpolate the missing P.

Coding Counterfactuality.

As mentioned in the previous section, determining the counterfactuality of a conditional requires that one analyze contextual factors in the data. However, this analysis is implicit in the categories described above (i.e. "expression of willingness" and "proof-by-contradiction").

In the refusal role-plays, all conditionals which were coded as expressions of willingness contained a P-clause which was demonstrated to be counterfactual by the reason for not complying with the request. In the logic puzzles, every proof-by-

contradiction involved a conditional where the P-clause was demonstrated to be counterfactual by the counterfactuality of the Q-clause.

Since counterfactuality is implicit in each of these two categories, data was not explicitly coded as counterfactual or not.

Results from Refusal Role-play

[The following abbreviations are used throughout this section:

- *$300   = the "Can you lend me $300?" role-play*
- *Moving   = the "Can you help me move?" role-play*
- *Subbing = the "Can you substitute for another teacher?" role-play*
- *Day Off   = the "Can I take the day off next Friday?" role-play]*

The refusal role-plays were successful at eliciting at least one refusal in all but one of the dialogues (See Table 1). In the *Moving* role-play the participant who did not refuse the initial request (Participant #5) did provide the reason that she could not grant the request, but she did not realize initially that there was a time conflict. By the time she had realized there was a time conflict, the requester had already withdrawn his request. Therefore, her reason was not coded as an RTR.

	$300	Moving	Subbing	Day Off
Refuses Initial Request	10	9	10	10

Table 1. The number of dialogues in which participants refused the initial request

In addition, there was one dialogue which had a refusal but no request. Specifically, in one of the dialogues from the *Moving* role-play the requester (Participant #16) asked the other participant (Participant #15) if he knew anyone with a truck but made it clear that he was not requesting to borrow #15's truck. He did this by emphasizing that #15 was going camping. Nevertheless, #15 treated #16's question as

if it were a request by issuing a refusal. Therefore, 16's question was coded as a request.

Although all but one role-play began with a refusal of the initial request, there were some instances in which the request refused was later granted. For instance, even though nine of the ten *Moving* dialogues began with a refusal to lend the truck, in three of those nine dialogues, the requesters (Participants #10, #18, #20) ended up borrowing a third party's car, driving it out to the campsite, and temporarily swapping it for the truck.

As for the semantic formulae of refusals occurring in the dialogues, all but one consisted of a reason to refuse (RTR), and many were accompanied by an EWG. Every EWG which accompanied an RTR occurred just before an RTR. Sometimes, these EWG + RTR sequences were preceded by another RTR, but RTR + EWG + RTR sequences did not occur consistently enough to characterize a unique environment, so EWG's followed by RTR's were always coded as "EWG + RTR," regardless of whether they were preceded by another RTR. RTR's which occurred in isolation were coded as "~~EWG~~ + RTR." The one refusal which was issued without an RTR was an expression of inability to grant the request (EIG). It was preceded by an EWG and was coded as "EWG + EIG" (See Table 2).

As illustrated in Table 2, the *$300* role-play and the *Subbing* role-play were both fairly successful at eliciting EWG + RTR sequences. However, the *Moving* role-play and *Day Off* role-play were less successful at eliciting EWG + RTR sequences. Moreover, in the *Day Off* role-play two of the four participants who produced an EWG + RTR sequence (Participants # 11, #13) did so only after first producing an ~~EWG~~ + RTR sequence.

In the *Moving* role-play four of the five participants who refused to lend their truck but did not preface their refusal with an EWG (Participants #3, #7, #9, #11) ended up suggesting that the requester borrow a truck from someone else. Two of these four even directed the requester to a specific person. In contrast, none of the people who prefaced their refusal with an EWG suggested borrowing a truck from someone else.

	$300	Moving	Subbing	Day Off
At least 1 EWG + RTR	8	5	7	4
Only ~~EWG~~ + RTR	2	4	2	6
EWG + EIG	0	0	1	0
Total	10	9	10	10

Table 2. The number of dialogues in which semantic formulae of particular types were provided in response to a request

One refusal was quite idiosyncratic in that it was added as an afterthought. In the *Moving* role-play, after the refuser (Participant #9) began to suggest an alternative, she added the EWG + RTR sequence:

(25) 9: "Not that I wouldn't do it, [EWG] but I've had this other commitment."
    [RTR]

In the EWG + RTR sequences which were produced, roughly two thirds of EWG's were counterfactual conditionals, and the remaining one third were other types of EWG's (See Table 3a). Also, of the EWG + RTR sequences which occurred, the counterfactual conditional EWG's were predominantly second conditionals, while the other types of EWG's were predominantly phrases beginning with "I wish…" (See Table 3b).

	$300	Moving	Subbing	Day Off
Counterfactual Conditional EWG's	5	4	6	4
Other Types of EWG's	3	2	2	2

Table 3a. The number of dialogues in which EWG's of particular types were produced in an EWG + RTR sequence in response to a request

		$300	Moving	Subbing	Day Off
Counterfactual Conditional EWG's	**2nd conditional**	5	4	5	3
	Conditional P = Past Q = "may"	0	0	0	1
	3rd conditional	0	0	2	0
Other Types of EWG's	**I wish…**	3	1	1	1
	I want…	0	1	0	1
	Indirect	0	0	1	0

Table 3b. The number of dialogues in which EWG's of particular types were produced in an EWG + RTR sequence in response to a request

Of the second conditional EWG's which were produced in EWG + RTR sequences, about half were conditionals with covert P-clause of the form "I'd love…," "I'd like…," or "I wouldn't mind…"; about one fourth were other types of covert conditionals; and the remaining one fourth were conditionals with overt P-clause (See Table 4).

			$300	Moving	Subbing	Day Off
2nd conditional EWG's	**With Covert P-clause**	**Would (love/like/ not mind)**	4	2	4	1
		Would (Other)	0	2	1	1
	With Overt P-clause	**If P, then Q**	2	0	2	1

Table 4. The number of dialogues in which second conditionals of particular types were produced in an EWG + RTR sequence in response to a request

In the *Subbing* role-play, one response was particularly difficult to categorize:

(26)18: "…if I hadn't made this commitment first, I, I would've… I don't know what
I would've done, …"

Although the Q-clause ("I don't know what I would've done.") is a conditional expression, it does not seem to convey willingness. However, when one compares this utterance with the rest of the dialogue, it seems that the Q which participant #18 actually intended was something like, "…I would've taught the class." In other words, the Q that was actually produced is likely the result of a "short-circuit." Therefore, this utterance was coded as an EWG.

The most common outcome of the role-plays was for the requester to abandon the attempt to get help (AAGH). This occurred in just over half of the refusal dialogues.

Requester…	$300	Moving	Subbing	Day Off
…Abandons Attempt to Get Help	6	6	5	7
…Accepts Alternative Form of Help	2	3	1	2
…Accepts Promise to Try to Help	1	1	2	0
…Accepts Suggestion of Alternative	1	1	1	0
…Re-issues Request, Gets It Granted	0	0	1	0
Total	10	10	10	9

Table 5. The number of dialogues which resulted in outcomes of particular types

The second most common outcome was for the requester to accept an alternative form of help. Other outcomes included: 1) Requester accepting the other speaker's promise

to try to help, 2) Requester accepting suggestion of alternative, and 3) Requester re-issuing request and getting it granted (See Table 5).

The significance of AAGH's to the present study is that they characterized the second environment in which EWG's occurred. However, elicitation of an EWG in response to an AAGH did not occur as frequently as elicitation of an EWG in response to a request. Even in the *Moving* role-play, which had the highest number of EWG's occurring after AAGH's of any of the role-plays, only three participants responded to an AAGH with an EWG (See Table 6).

	$300	Moving	Subbing	Day Off
EWG	3	1	2	1
Alternative Offer	0	1	3	0
Apology	2	1	0	2
Focus On Positive	0	0	0	3
ExEmpathy	1	0	0	0
Positive Evaluation	0	1	0	0
Wish Good Luck	0	1	0	0
No Positive Remark	0	1	0	1
Total	6	6	5	7

Table 6. The number of dialogues in which Abandoning the Attempt to Get Help (AAGH) was followed by utterances of particular types

Aside from EWG's, the most common responses to an AAGH in the *$300*, *Moving*, and *Subbing* role-plays were making an alternative offer and apologizing. The most common responses to an AAGH in the *Day Off* role-play were apologizing and focusing on the positive aspect of the refusal.

There was only one instance in which an EWG occurred in an environment that was not clearly identifiable as a response to a request, nor as a responses to an AAGH.

In the *Subbing* role-play, one participant (Participant #8) produced an EWG in the following environment:

(27) 7: "Okay."

8: "But I'm really sorry. <u>I would, I would honestly be able to su-... and if it was any other Saturday...</u>" [EWG]

Just prior to this, Participant #8 had explained that she would be unable to substitute for another teacher on Saturday. Therefore, Participant #7's "Okay." is probably intended as an acceptance of that refusal. Then, Participant #8 responds to the "Okay." by providing an EWG with no accompanying RTR. In all other dialogues, isolated EWG's occurred only after AAGH's. Therefore, it is probable that, regardless of what Participant #7 actually intended, Participant #8 is treating the "Okay." as an AAGH. However, "Okay." Does not unambiguously communicate an AAGH, so it was not coded as such.

Results from Logic Puzzles

The logic puzzles were fairly effective at eliciting proof-by-contradictions (PBC's). For each of the four puzzles approximately three fourths of participants provided PBC's (See Table 7).

	Coins	**Switches**	**Robbers (a)**	**Robbers (b)**	**Game Show**
Proof-by-contradiction	17	15	14	6	15

Table 7. The number of logic puzzles in which participants provided proof-by-contradiction

However, although the first question of the *Robbers* puzzle was effective at eliciting PBC's, the second question was not. The first question of the *Robbers* puzzles elicited a PBC from 70% of participants, while the second question elicited a PBC from only 30% of participants.

The number of conditionals with canonical patterns is illustrated in Table 8. As the table shows, most of the logic puzzles were not very effective at eliciting second conditionals. Although the *Coins* puzzle elicited second conditionals from 70% of participants, the *Switches* and *Game Show* puzzles elicited second conditionals from only about 50% of participants, and the *Robber* puzzle from only 35% of participants.

Close comparison of Tables 7 and 8 will reveal that the canonical patterns do not account for all proof-by-contradiction data. For instance, although Table 7 reports 17 proof-by-contradictions for the *Coins* puzzle, Table 8 reports only 14 conditionals for that puzzle, leaving 3 conditionals unaccounted for. One reason for this discrepancy is that the canonical patterns do not account for conditionals in which the head verbs of

		Coins	Switches	Robbers (a)	Robbers (b)	Game Show
Past Tense Only	**3rd Conditional**	0	1	0	0	1
	2nd Conditional	14	11	7	3	9
Present Tense Only	**1st Conditional**	0	0	1	0	0
	0 Conditional	0	1	3	1	2

Table 8. The number of logic puzzles in which canonical conditionals were used in proof-by-contradiction conditionals

the P- and Q-clauses have different tenses. Another reason for the discrepancy is that the canonical pattern model does not account for conditionals in which only P or only Q has a *have + past participle* sequence. An example of such a conditional occurs in one of the responses to the *Game Show* puzzle:

(28) 19: "If it had 1 on the paper, he would have said door #2…"

In other words, the canonical patterns model does not enable us to provide a full account of the data. However, there is a simpler model which does enable us to

provide a full account of the data, namely one in which we group conditionals based solely on the verb tenses of the head verbs of P and Q (See Table 9).

		Coins	Switches	Robbers (a)	Robbers (b)	Game Show
One Tense Only	Past Tense Only	16	14	7	3	11
	Present Tense Only	0	1	4	1	2
Both Tenses	Mixed Tenses	1	0	3	2	1
Neither Tense	Neither Tense	0	0	0	0	1

Table 9. The number of logic puzzles in which verb tense combinations of particular types were used in proof-by-contradiction conditionals

Not only does this provide a fuller account of the data, but it is semantically well-motivated. Second conditionals, third conditionals, and conditionals like (28) are not only related by virtue of the tense of the head verbs of the P and Q clauses, but are also by virtue of the fact that they all convey a sense that the speaker considers both P and Q as remote.

As illustrated by Table 9, PBC's elicited by the logic puzzles tended to involve only one verb tense. Moreover, in the *Coins*, *Switches*, and *Game Show* puzzles, almost all responses which used proof-by-contradiction used conditionals with only past tense. In the *Robbers* puzzle, only half of responses which used proof-by-contradiction used conditionals with only past tense.

Comparison of Tables 8 and 9 reveals that the logic puzzles elicited slightly more conditionals with only past tense than they did second conditionals. This was especially true for the *Switches* puzzle, which elicited conditionals with only past tense from 70% of participants.

The conditionals with only one verb tense had one of two forms: 1) P- and Q-clauses both had head verbs of the same tense, or 2) Only the Q-clause had a head

verb. It could happen that only the Q-clause had a head verb when one of the following occurred: 1) P was a noun phrase (either a gerund or an pronoun which refers to a previous clause, 2) P was conveyed by the word "Otherwise…", or 3) P was covert.

Conditionals in which P- and Q-clauses had head verbs of the same tense were far more common than conditionals in which only the Q-clause had a head verb (See Table 10). This was the case both for conditionals with past tense only and for conditionals with present tense only.

		Coins	Switches	Robbers (a)	Robbers (b)	Game Show
Past Tense Only	**P = verb**	15	12	6	3	8
	P = no verb	1	2	1	0	3
Present Tense Only	**P = verb**	0	1	4	1	1
	P = no verb	0	0	0	0	1

Table 10. The number of logic puzzles in which conditionals containing only present tense or only past tense contained an overt verb in the P-clause

As illustrated in Table 9 above, there were a small number of responses in which the P and Q clauses had head verbs with different tenses. When this occurred, it was

	Coins	Switches	Robbers (a)	Robbers (b)	Game Show
P = Pres Q = PastMod	0	0	2	2	0
P = Past Q = PresMod	0	0	0	0	1

Table 11. The number of logic puzzles in which particular combinations of present and past tense occurred

typically of the form P = Present, Q = Past Modal. In fact, there was only one response of the form P = Past, Q = Present Modal (See Table 11). In other words, when mixing

tenses, participants will tend to "shift" from present to past tense rather than from past to present tense.

Participant Feedback

After completing all the logic puzzles, participants were asked to provide, in writing, suggestions for improving the puzzles as well as examples of when they use proof-by-contradiction in real life.

Improving the Puzzles.

In general, participants reported that the logic puzzles were clearly written. However, three participants (Participants #3, #4, and #11) reported being confused when they saw what appeared to be the solutions to the puzzles at the bottom of each page.

Nine participants reported having difficulties with the *Robbers* puzzle. Six of these nine (Participants #2, #7, #9, #12, #14, and #19) reported being confused by the fact that the same names were used for both the robbers and the countries, two of these nine (Participants #6, #8) reported misreading the problem, and the remaining participant (Participant #9) reported having difficulty negating sentences which were already negated (e.g., "It is not true that Ms. Lux is not in Finland.").

Three participants (Participants #3, #5, and #13) reported having difficulty with the *Switches* puzzle, because there was too much text.

Evidence of Ability to Transfer Knowledge.

Nine participants (Participants #8, #9, #10, #11, #12, #14, #15, #16, #17) provided clear evidence that they use proof-by-contradiction in the real world. They did so by providing specific example sentences of a proof-by-contradiction. However, Participant #9 also provided evidence that she did not fully understand what proof-by-contradiction is.

Six participants (Participants #1, #3, #5, #6, #19, #20) provided insufficient evidence that they use proof-by-contradiction in the real world. They described

situations which would potentially be suitable contexts for using proof-by-contradiction but did not provide enough detail for the researcher to determine how they would have used proof-by-contradiction in that situation.

Two participants (Participants #7, #9) provided evidence that they did not fully understand what proof-by-contradiction is.

Four participants (Participants #2, #4, #13, #18), when asked about their ability to transfer knowledge of proof-by-contradiction to the real world, provided no response.

Chapter 5: Discussion

Overview

I begin this section by considering the potential benefits of defining the target language in a more general way. Then, I give an overview of revisions that were made to the test specs and test items after data analysis. I follow this by providing a pedagogical rationale for including counterfactual second conditionals in an ESL/EFL curriculum as well as an overview of potential ideas for how counterfactual second conditionals could be taught. I conclude by discussing limitations of the study.

Redefining the Target Language

For this study test items were designed with the intention of eliciting from a significant majority of participants expressions of willingness to grant requests (EWG's) and proof-by-contradictions (PBC's) expressed as counterfactual second conditionals. After a post hoc analysis of data, the researcher decided to pin "significant majority" at 70%. However, the researcher also found it necessary to re-evaluate whether confining the target language to second conditionals was potentially too limiting.

Refusals.

The researcher successfully developed two role-plays which elicited EWG's from a significant majority of participants. Specifically, the *$300* and *Subbing* role-play elicited EWG's from, respectively, 80% and 70% of participants. However, in each of these two role-plays, only 50% of participants expressed their EWG's as second conditionals. The remaining participants expressed EWG's using other expressions, most notably third conditionals and phrases beginning with "I wish…"

In other words, the refusal role-plays successfully elicited from a significant majority of participants the target illocutionary act but not the target form, indicating a slight incongruence between elicited data and the target language (as it was originally stated). To resolve this incongruence, there are two possibilities.

If it could be demonstrated that second conditional EWG's and other types of EWG's perform different illocutionary acts, and if these acts could be defined in sufficient detail, then it should be possible (in theory at least) to manipulate task factors so as to increase the likelihood that second conditional EWG's (rather than other types of EWG's) would be elicited.

On the other hand, if we act on the assumption that the functions performed by second conditional EWG's and other types of EWG's are more or less identical, then it would be well-motivated to redefine the target language for the refusal role-play tasks so as to include other forms for EWG's.

Since this researcher was unable to identify a functional difference between the various types of EWG's, he advocates the latter approach of redefining the target language for the refusal tasks so as to include other types of EWG's.

Logic Puzzles.

The researcher successfully developed four logic puzzles which elicited PBC's from a significant majority of participants. Each of the four logic puzzles elicited PBC's from 70% or more of participants. Moreover, one of the puzzles, the *Coins* puzzle, was also successful at eliciting *second conditional* PBC's from exactly 70% of participants (a significant majority). On the other hand, the remaining three puzzles only elicited second conditional PBC's from 35% - 55% of participants.

In other words, the *Coins* puzzle demonstrated the possibility of developing a logic puzzle for which there is congruence between elicited data and the target language (as it was originally stated), but the results from the other logic puzzles suggest that achieving such congruence is quite difficult.

If the target structure were redefined so as to include not only second conditionals, but also other types of past-tense-only conditionals, then an additional puzzle, the *Switches* puzzle, would have also been successful at eliciting from a significant number of participants the target structure. The *Coins* puzzle and *Switches* puzzle elicited past-tense-only conditionals from, respectively, 80% and 70% of participants.

Although the target structure for the logic puzzle tasks was originally defined as second conditionals, there are disadvantages to defining the target structure so narrowly. First, counterfactuality only has bearing on whether head verbs are in the past tense, not on whether *have + past participle* sequences are used. Therefore, if one is interested in assessing participants' understanding of how past tense and counterfactuality are related, there is no reason to give second conditionals a privileged place over conditionals in which either P or Q (or both) contain a *have + past participle* sequence. Second, as the elicited data demonstrates, designing tasks which specifically elicit second conditionals can be very challenging.

However, regardless of practical difficulties, designing tasks which specifically target *second* conditionals has a pedagogical rationale. There are many ESL/EFL learners who mistakenly believe that past tense necessarily indicates past time reference. By studying illustrative examples of past-tense-only conditionals which clearly do *not* have past time reference, these learners can more easily "unlearn" this overgeneralization.

Therefore, the researcher advocates, in so far as it is possible, designing tasks which will tend to elicit second conditionals (as opposed to other types of past-tense-only conditionals). However, since the purpose of test items is to assess learners' knowledge of the relationship between past tense and counterfactuality, when test items are administered to learners, all past-tense-only conditionals should be considered as potential sources of evidence of learners' grammatical knowledge.

Test Spec & Test Item Revision

Some tasks were less successful at eliciting the target language, indicating a lack of congruence between the stated test specifications and these test items. To some extent, this may be resolvable by fitting items to specs. However, in some instances, it may be that the specs themselves require revision.

Refusal Role-plays.

In the *Moving* role-play four of the five participants who refused to lend their truck but did not preface their refusal with an EWG (Participants #3, #7, #9, #11) also suggested that the requester borrow a truck from someone else. Two of these four even directed the requester to a specific person. In contrast, none of the people who prefaced their refusal with an EWG suggested borrowing a truck from someone else.

Also, three participants agreed or provisionally agreed to temporarily swap the truck for a third party's car (Participants #9, #17, #19). Two of these participants did not preface their refusal with an EWG.

In both cases, participants' failure to issue an EWG seems to be correlated with the fact that they perceived the requester to have at least one other option. In fact, this was the rationale behind the following test specification:

(29) "R2 [the refuser] is Unable to Offer Alternative Solutions."

After data collection, in order to resolve this incongruence, the *Moving* prompt was appended to indicate…

1) …that neither participant knew anyone else with a truck

…and…

2) …that the truck was being used to transport large camping equipment

In the *Day Off* role-play, only four of ten participants prefaced their refusal with an EWG (Participants #1, #7, #11, #13). The *Day Off* role-play was unique in two respects. First, it was the only role-play in which the refuser had power over the requester. Also, it was the only role-play in which the request was a request for permission.

Brown and Levinson (1987) posit a theory of politeness which states that the language used to perform polite acts is a function of its weightiness W, which in turn is a

function of the three variable D = social distance between speaker and hearer, P = power of hearer over speaker, and R_x = size of the imposition. The relationship between these four variables can be stated as:

$$W = D + P + R_x$$

Although the test specifications for the refusal role-plays stipulate that participants should have a certain degree of social distance, the relative power relationship between participants was not initially identified as a potentially relevant task factor. However, it is the power relationship between speaker and hearer that distinguishes the *Day Off* role-play from the other refusal role-plays. In this role-play the relative power of the hearer (the employee) over the speaker (the boss) is negative, which renders the overall weightiness of the refusal relatively low (as compared with the other role-plays).

Since politeness theory accounts for why the *Day Off* role-play elicited so few EWG's, the researcher revised test specs so as to stipulate that the refuser should not have power over the requester. The corollary of this is that the *Day Off* role-play is probably ill-suited to the elicitation of EWG's; i.e. it probably cannot be made to fit to specs.

Logic Puzzles.

For the *Robbers* puzzle six participants (Participants #2, #7, #9, #12, #14, and #19) reported being confused by the similarity between the names of women and of countries. Therefore, the test item was revised so that the women and the countries would have different names.

Three participants (Participants #3, #4, and #11) reported being confused when they saw what appeared to be solutions to the logic puzzles at the bottom of each page. Although the final solution to each logic puzzle was provided, the reasoning process which led to that solution was not. In other words, the logic puzzles required

participants to work out the reasoning process which led to the final solution, but not the final solution itself.

However, this was not explained to participants and may have caused the confusion which some participants reported. As a result of this feedback, the researcher revised the instructions for the logic puzzles to more accurately reflect what information participants were expected to provide.

A post hoc analysis of the data collection instrument revealed that the questions in the prompts all have a present time reference. Consider example (21), restated here:

(21) "How do you know that Box A <u>does</u> not contain 5 cents?"

For the purpose of eliciting a PBC, "does" could probably be replaced by "did." However, the present tense in (21) may act as a trigger which predisposes participants to produce conditionals with a present time reference (i.e. second conditionals). Therefore, the researcher appended the test specifications to stipulate that prompt questions should have a present time reference.

Pedagogical Rationale

One reason for including counterfactual conditionals in the curriculum of an ESL/EFL course is that many language learners (e.g., East Asian learners) come from L1 backgrounds for which counterfactuality has no bearing on grammatical structure.

However, to evaluate whether it is pedagogically well-motivated to teach counterfactual conditionals, educators should also consider whether learners are likely to encounter contexts and situations in which counterfactual conditionals are likely to arise.

For the purpose of refusing teaching learners how counterfactual conditionals are used seems well-motivated, because situations in which refusals arise are quite common. In particular, learners who use English in day-to-day interactions will almost certainly, at some point, be requested to do something which they will need to refuse, and it is important to be able to do so without offending the requester.

On the other hand, counterfactual conditionals which are used in proof-by-contradiction may be perceived as having less relevance for real-world tasks. However, proof-by-contradiction is, in fact, an exceedingly common technique for convincing or persuading. The following is a list of some of the situations in which proof-by-contradiction can be used to perform real-world tasks (asterisks indicate situations which participants themselves specified in post-test feedback.):

- disproving dubious claims
    - when evaluating advertisements*
    - in a court room

- correcting a misdiagnosis
    - of a health-related problem
    - of a learning disorder
    - of a mechanical/electrical problem (e.g., computer equipment, power outage, car problem, virus, a water leak*)

- correcting a misconception about the authenticity/value/safeness of something
    - explaining why a diamond is real/fake
    - explaining why food is safe/unsafe to eat
    - explaining why a website is safe/unsafe to use

- eliminating a possible cause of an unexplained phenomenon
    - in a debate*
    - in academic writing*
    - in scientific research*
    - when filing an insurance claim*

- when trying to explain a mysterious phenomenon (e.g., Benham's top, Bentley's Paradox)

- eliminating a possible location when trying to locate someone*

- interpreting the indirect meaning of someone's NOT saying/doing something* (e.g., "If she thought my paper was good, she would have…")

As the above list illustrates, proof-by-contradiction is used in a variety of domains. Moreover, it would seem to have particular relevance for students who need English for academic or scientific writing.

Pedagogy

As previously mentioned, this study represents the first step in a long-term project whose objective is the development of instructional materials. While the present study has not focused on instruction per se, it does have bearing on the form such instruction might take.

Target Language.

Teaching counterfactual conditionals would be beneficial for learners who speak an L1 in which counterfactuality has no bearing on verb tense (e.g., for Chinese, Japanese, and Korean learners). Moreover, it would be beneficial to initially narrow the focus of instruction to counterfactual *second* conditionals (and to not include other past-tense-only conditionals). First, second conditionals are linguistically simpler than other past-tense only conditionals, and second, second conditionals make more salient the fact that past tense does not necessarily indicate past time reference.

Expressions of willingness to grant a request (EWG's) frequently take the form of second conditionals. However, EWG's can be expressed in other ways, most notably with phrases beginning with "I wish…" Therefore, a treatment of second conditional EWG's in refusals could be complemented by a treatment of "I wish…" phrases as well.

Not only do these two structures seem to perform the same communicative function, but they also share the fact that they both use past tense to emphasize counterfactuality.

Memorization.

The following EWG conditionals occur with high frequency:

- I'd like to…, but...
- I'd love to…, but…
- I wouldn't mind…, but…

These phrases can be presented in two ways. One approach is for the instructor to recover the missing P-clause in order to show how these phrases have the form of second conditionals with covert P-clause. Another approach is to present these phrases as lexical chunks to be memorized. The first approach has the advantage that it can potentially give learners insight into the relationship between second conditionals and counterfactuality. The second approach has the advantage that it will more effectively enable learners to produce such phrases in real-time. A combination of both approaches may be maximally beneficial.

Interpretation.

In order to determine if a given second conditional is counterfactual, one must consider whether the P-clause has a present time reference. To do this, one must consider:

- the lexical aspect of the verb phrase (homogenous or not)
- the grammatical aspect of the verb phrase (progressive or not)
- time reference (future or not)

Therefore, a complete treatment of counterfactual second conditionals should make learners aware of these factors. One way of achieving this is by incorporating the following contrasts into instruction:

- State verbs vs. event verbs

  "If Mike was home, his lights would be on."

  "If Mike came home, his lights would come on."

- Habits vs. non-habits

  "If I drank coffee every day, I would not be able to sleep."

  "If I drank that coffee, I would not be able to sleep."

- Progressive vs. non-progressive

  "If the car alarm was making that noise, its lights would be flashing."

  "If the car alarm made that noise, its lights would flash."

- Explicit future time reference vs. no explicit future time reference

  "If I had a million dollars, I would not be at work."

  "If I suddenly had a million dollars tomorrow, I would not be at work."

Environment.

It would also be beneficial to teach learners the environments in which second conditionals occur. For instance, when used to perform refusals or proof-by-contradictions (PBC's), second conditionals tend to occur in the following sequences:

- 1: Request, 2: hedge + EWG + RTR
- 1: AAGH, 2:EWG
- P. If not P, then not Q. (where Q is known to be true.)

Instructional Techniques.

There are a variety of techniques which could be used to facilitate learning of the target structure and the environments it occurs in.

One technique which can be used is Processing Instruction, a type of instruction which has been demonstrated to positively contribute to grammar learning (VanPatten & Cadierno, 1993; Farley, 2005). This technique emphasizes the importance of explicitly addressing learners' false processing strategies and of contrasting the target structure with similar structures. The false processing strategies that should be addressed are: 1) past tense = past time reference, 2) expression of willingness to grant request = granting request. The contrasts which should be taught are outlined above in the section "Interpretation."

Another technique which could be used is consciousness-raising activities in which learners first analyze text (e.g., dialogues involving refusals and proof-by-contradictions) and then identify the communicative function of counterfactual second conditionals. To make the target language more salient, relevant sections of the text could be textually enhanced.

One more technique which can be used for instruction is studying the test items themselves. Since instruction will take place *after* the pre-test, the instructor could have learners go back, analyze the tasks, and compare their own elicited speech with the elicited speech of more proficient speakers. By directly linking instruction with the types of tasks that will used to assess learners, instructors can capitalize on the potential effect of positive washback.

Transferring Knowledge to Real-world Contexts.

For the logic puzzles 90% of participants provided a PBC for at one test item, and 80% provided a PBC for three or more test items. However, less than half of participants provided clear evidence that they knew how to transfer this knowledge to real-world contexts.

The disadvantage of the logic puzzles task type is that even if learners master the use of counterfactual second conditionals within the limited domain of solving logic

puzzles, it does not necessarily follow that they will transfer that knowledge to other domains. Therefore, it may be beneficial to explicitly identify domains in which PBC's are used, so that learners can anticipate when to activate their grammatical knowledge of counterfactual conditionals.

Workaround Structures

Although counterfactual conditionals seem to be the most natural way of expressing both PBC's and EWG's, if the primary objective of instruction is to improve learners' communicative ability, then it may be appropriate to include workaround structures in the instruction. For instance, a PBC can be expressed unambiguously using a present tense structure such as, "Let's imagine that … Then, it follows that…" Similarly, an EWG can be expressed (albeit somewhat awkwardly) with the structure, "I want to…, but…" And for some learners, the utility of such workaround structures may outweigh the difficulty of acquiring a grammatically counterintuitive structure such as counterfactual conditionals.

Limitations

The present study had several limitations which should be taken into consideration when drawing inferences from the results. For example, all participants held a bachelor's degree or higher, so the extent to which these findings would apply to people with less education is unclear. Also, as with any study with relatively small n size, one should exercise caution before generalizing the findings to larger populations.

Also, it is conceivable that the refusal role-plays are to some extent culture-specific. For instance, if a participant were to come from a culture in which lending one's car or truck is unusual, then a request to borrow one's truck may be perceived as an unreasonable imposition, and this could affect whether or not that participant issues an EWG. Because of this, test items could meet with limited success in eliciting the target language from participants from other cultures.

Another potential limitation of the study is that the system of coding was largely determined via a post hoc analysis. Therefore, there exists the possibility that the

semantic categories and sequences which were discussed in this paper were artifacts of this particular data set. To discount this possibility, additional data would need to be collected.

Finally, this study was an attempt to identify *sufficient* conditions for elicitation, not *necessary* conditions. Therefore, it is quite conceivable that one or more of the test specifications is superfluous and did not contribute in any significant way to the elicitation of the target structures. To tease apart the relative importance of the various specifications, further study would be necessary.

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Appendix A: Task Type 1 - Refusal Role-plays - Sample Items
Practice Item

Can you make it to the party?

A: The requester

Your role:	You are a college student.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	It is the end of the semester soon. You are organizing a small party for your classmates on Saturday.
Instructions:	You will begin the role-play. Pretend to call your classmate on the phone and Invite him/her to the party.

B: The refuser

Your role:	You are a college student.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	It is the end of the semester soon. Your friend will invite you to party on Saturday. However, you are leaving on Thursday, so you will not be able to attend.
Instructions:	Wait for classmate to begin the role-play. He/she will call you on the phone. You really want to attend the party, but you will refuse the request.

Sample Item 1

Can you lend me $300?

A: The requester

Your role:	You are a college student. To pay for school, you have student loans, and you work a part-time job.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	Recently, you had a car accident. Luckily, you were not injured, but your car was totally ruined. Because you live far from campus, you need a car to get to school. Unfortunately, your insurance company did not give you any money to buy a new car, so you bought one with your own money. Because of this, you now do not have enough money to pay this month's bills (rent, electricity, gas, etc.). The rent is due in 3 days. You need about $300 more. You don't want to ask your parents for money.
Instructions:	You will begin the role-play. Pretend to call your classmate on the phone and ask him/her to lend you the $300 that you need.

B: The refuser

Your role:	You are a college student. To pay for school, you have student loans, and you work a part-time job.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	Your classmate (the other person in this role-play) will ask you to borrow some money. This person really needs the money, and you feel very sorry for him/her. However, you have almost no money in your bank account, and your next paycheck is 2 weeks away.
Instructions:	Wait for classmate to begin the role-play. He/she will call you on the phone. You really want to help him/her, but you will refuse the request.

Sample Item 2

Can you help me move?

B: The requester

Your role:	You are a college student. You own a truck.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	Today is Thursday, July 30th, and you're at home. Tomorrow, Friday, July 31st, you're moving out of your apartment. Your new contract starts Sunday, August 2nd. You were planning on using your truck to move, but unfortunately, it stopped working this morning. Now, it's at the mechanic's. You told your landlord about this, but he said that you have to get out of the apartment by the 31st, because someone is moving in on August 1st. Also, your new landlord will not let you move your things into the new place before August 2nd, because it's being painted. You can rent a moving truck for 3 days (Jul. 31st – Aug. 2nd), but this will cost over $100. Fortunately, one of your classmates (the other person in this role-play) has a truck.
Instructions:	You will begin the role-play. Pretend to call your classmate on the phone and ask him/her to help you move.

A: The refuser

Your role:	You are a college student. You own a truck.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	Today is Thursday, July 30th, and the semester will be starting again soon. To relax before classes start, you and 3 close friends are at a campsite. You have brought camping equipment, a grill, and several kayaks. You transported this equipment in your truck, because none of your friends had cars with enough space. You arrived at the campsite this morning, and you are planning on driving back Sunday evening, August 2nd. Your classmate (the other person in this role-play) will call you and ask for help moving. You want to help, but you are 2 hours away from town.
Instructions:	Wait for your classmate to begin the role-play. He/she will call you on your phone. You really want to help him/her, but you will refuse the request.

Sample Item 2

Can you help me move? (Continued)

July

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

July

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Sample Item 3

Can you substitute for another teacher?

A: The requester

Your role:	You are the principal of a private school.
The other role:	The other person is a teacher who started working at your school 3 months ago.
Situation:	It is Friday afternoon, and you are at school. Julie, one of your teachers, teaches a Saturday class. However, Julie cannot teach her class, because she has the flu. There are 3 other teachers that are qualified to teach this class. Unfortunately, 2 of them cannot teach on Saturday: one of them is out of town, and the other one has the flu (just like Julie). However, there is one other teacher that you can ask (the other person in this role-play). He/she has less experience than the other 2 teachers, but he/she is qualified to teach the class.
Instructions:	You will begin the role-play. Pretend to go to the teacher's (the other person in this role-play) classroom and ask him/her to substitute teach for Julie.

B: The refuser

Your role:	You are a teacher at a private school. You started teaching at this school about 3 months ago. Your teaching schedule is Monday-Friday.
The other role:	The other person is the principal of the school.
Situation:	It is Friday afternoon, and you are in your classroom. You have finished teaching for the day, and you are about to go home. Julie, one of the other teachers, teaches a class on Saturdays. The principal (the other person in this role-play) will enter the room and ask you to substitute teach Julie's class tomorrow. However, you have already promised to pick up your friend at the airport on Saturday (tomorrow). The airport is 2 hours from your house, so you will be gone most of the day.
Instructions:	Wait for the principal to begin the role-play. He/she will come to your classroom. You want to help, but you will refuse the principal's request.

Sample Item 4

Can I take the day off next Friday?

B: The requester

Your role:	You design advertisements for a large advertising company. You have a son that is a talented high school basketball player.
The other role:	The other person is your boss.
Situation:	You're at work. Recently, you have been working on an advertising campaign for the well-known German car company VMW. Representatives from that company will visit your office next Friday. You are scheduled to give a presentation to get them to sign the contract. However, you just learned that your son's basketball team will compete in the state finals next Friday. The game is in the evening, but it is 3 hours away. In order to attend the game, you need the day off of work. Maybe someone else can do the presentation.
Instructions:	You will begin the role-play. Pretend to go to your boss's (the other person in this role-play's) office. You will ask him/her if you can have next Friday off of work.

A: The refuser

Your role:	You are the boss at a large advertising company.
The other role:	The other person is one of your employees. He/she designs advertisements.
Situation:	You're at work. Recently, one of your employees (the other person in this role-play) has been working on an advertising campaign for the well-known German car company VMW. Representatives from this company will visit your office next Friday. This employee is scheduled to give a presentation to get them to sign the contract. However, your employee wants the day off of work for family reasons. The reason for the request is a good one, but no one else knows the campaign well enough to give the presentation.
Instructions:	Wait for employee to begin the role-play. You want to help him/her, but you will refuse his/her request.

Appendix B: Task Type 2 - Logic Puzzles - Instructions

Instructions:
You will do several logic puzzles. For each puzzle, there is a story and one or more questions. Read the story carefully and answer the questions.

Please notice:

- Questions are always in *italicized* letters like this:

  Question: Do you understand?

- Important details are **<u>bold and underlined</u>** like this:

  <u>Bold, underlined words provide key information, so pay attention to them.</u>

Questions:
Before you begin, do you have any questions?

Appendix C: Task Type 2 - Logic Puzzles - Sample Items
Sample Item 1

The Boxes and the Coins

You are Sherlock Holmes's assistant. You and he are in a castle, because you have been captured by the evil Professor Moriarty. Professor Moriarty has promised to release both of you, but first, you must solve one of his puzzles.

Professor Moriarty places 3 boxes on a table (Box A, Box B, and Box C) (see Diagram below). He says, "Here are 3 boxes. One of the boxes contains 5 cents, one contains 10 cents, and one contains 15 cents. As you can see, each box has a label. **However, at least two of these labels are incorrect**. (In other words, maybe two boxes are labeled incorrectly, and maybe all three boxes are labeled incorrectly.)

First, Professor Moriarty tells Sherlock Holmes to look inside Box A. Sherlock opens the box, looks inside, and closes it. Then, Moriarty asks Sherlock, "Based on the amount of money in Box A, how much money is in Box C?"

Sherlock thinks for a moment and answers, "I don't know. I don't have enough information."

Unfortunately, you were not able to see how much money was in Box A. However, you think for a moment and realize that Box A cannot contain 5 cents.

Question: How do you know that Box A does not contain 5 cents?

Moriarty laughs and turns to you. He asks you to look inside Box B. You open the box, see that it contains 15 cents, and close it. Then, Moriarty repeats his question, "How much money is in Box C?"

You smile and answer Moriarty's question, "Neither Box A nor Box B contains 5 cents. Therefore, Box C must contain 5 cents."
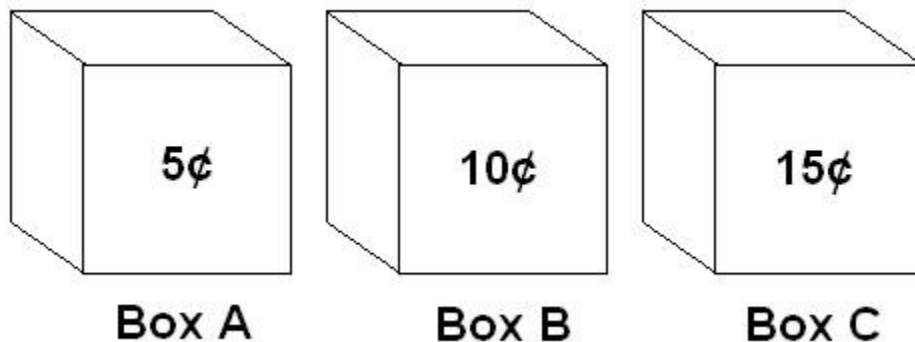

Diagram – Three Boxes

Sample Item 2

The Heat Lamp

Definitions:
A *heat lamp* is a powerful light bulb which is designed to produce both light and heat.
A *blindfold* is something (such as a cloth) that covers someone's eyes to prevent them from seeing.

You are Sherlock Holmes's assistant. You and he are in a castle, because you have been captured by the evil Professor Moriarty. Professor Moriarty has promised to release both of you, but first, you must solve one of his puzzles.

Professor Moriarty takes you and Sherlock into Room 1 (see Diagram below) which has 3 light switches, a digital screen, and a door. All the light switches are off, and the digital screen is blank.

Moriarty explains, "In the next room (Room 2), there is a powerful heat lamp. The heat lamp is controlled by one of these 3 light switches."

Moriarty continues, "Only one switch will turn the heat lamp on, but all of the switches will turn the screen on. The screen will briefly display the temperature in the next room (Room 2) and then turn itself off."

Moriarty stops speaking and places a blindfold over Sherlock's eyes, so that Sherlock cannot see. Then, Moriarty turns to you and continues, "Here are the rules. You may turn on two switches. After that, I will remove Sherlock's blindfold. Then, Sherlock will enter the next room (Room 2). Finally, you and he will each have a chance to answer this question: Which switch controls the heat lamp?"

You think for a while and finally come up with a plan. First, you turn on light switch 1. When you do this, the screen briefly shows 18.0°C and then goes blank. After that, you leave light switch 1 on and wait 30 minutes. Then, you turn on light switch 2. Again, the screen shows 18.0°C and goes blank. The screen only comes on for one second, so you do not know whether the temperature in Room 2 increased after you turned on switch 2. On the other hand, you now know that switch 1 definitely does not control the heat lamp.

Moriarty removes Sherlock's blindfold. **Sherlock can see that switch 1 and switch 2 are both on, and that switch 3 is off. However, he does not know which switch you turned on first.** Also, since the screen is blank, he does not know whether the temperature of Room 2 has changed.

At this point, **Moriarty leaves you alone in Room 1 and takes Sherlock into the next room (Room 2)**. When entering Room 2, Sherlock must go through 2 doors. This is to prevent someone in Room 1 from seeing inside Room 2. Therefore, you cannot see whether the heat lamp is off or on. A few moments later, Moriarty and Sherlock exit Room 2.

Moriarty then asks Sherlock which switch controls the heat lamp, and he responds, "I don't know."

Question: Based on Sherlock's answer, is the heat lamp off or on? How do you know?

Moriarty turns to you and asks which switch controls the heat lamp. You smile and say, "Neither switch 1 nor switch 3 controls it. Therefore, switch 2 must control it."
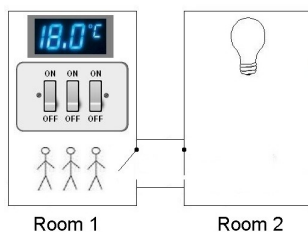

Diagram – Three Light Switches

Sample Item 3

The Bank Robbers

You are Sherlock Holmes's assistant. You and he are trying to solve a mystery. Ms. Englund, Ms. Finn, and Ms. Lux are 3 international criminals that are planning a bank robbery somewhere in Europe. The police know that one of them is in England, one of them is in Finland, and one of them is in Luxembourg. They have asked Sherlock Holmes to find out which of the 3 women is in England. Sherlock has collected the following information:

1) Ms. Lux is in England.
2) Ms. Lux is not in Finland.
3) Ms. Englund is not in Finland.
4) Ms. Englund is not in Luxembourg.

However, Sherlock has just learned that **only 1 of these sentences is actually true. The other 3 sentences are false**. Unfortunately, no one has told him which sentence is the true one.

He studies the clues very carefully and then shouts, "Aha! Sentence 1 is false. The woman that is in England is definitely not Ms. Lux."

Question: How does Sherlock Holmes know that sentence 1 is false?
    (Think about the relationship between sentence 1 and 2.)

He studies the clues for a while longer and then says, "I see! The woman that is in England is definitely not Ms. Englund either."

Question: How does Sherlock Holmes know that Ms. Englund is not in England?
    (Hint: Think about the relationship between this question and sentences 3 & 4.)

Sherlock Holmes smiles. You realize that he has solved yet another case and that the woman in England must be Ms. Finn.

Sample Item 4

The Game Show

Definitions:
An *odd* number is a number like 1, 3, 5, 7, etc.
An *even* number is a number like 2, 4, 6, 8, etc.

You and your friend Larry are on a TV game show. You are teammates. The game show host takes you and Larry to a stage which has doors numbered 1 through 4 (see Diagram below).

The game show host says to you and Larry, "Behind one of these doors is $20,000, but behind the other doors are goats. Guess the door with the money behind it, and you can keep it. To help you, I'm going to give each of you a hint. After I give hints to both of you, one of you may guess which door is the correct one. However, after one of you has guessed, the other person may not guess.

The game show host continues, "Larry, I'll give you a hint first. **The correct door is next to door number…**"

Instead of saying the number, the game show host writes it on a small piece of paper and shows it to Larry. Unfortunately, **you cannot see the number that is written on Larry's piece of paper**.

Larry stares at his piece of paper for a few moments and then says, "Well, this information is helpful, but **I still don't know for certain which door has the money behind it.**"

Even though you cannot see the number on Larry's piece of paper, you think for a moment and realize that it must be a "2" or a "3."

Question: How do you know that Larry's piece of paper does not have a "1" or "4" on it?

Then, the game show host turns to you and says, "Now, here's your hint. The number of the door with the money behind it is…"

The game show host writes your hint on a piece of paper and shows it to you. It says, "…an odd number."

Based on this information, you answer, "The money is behind door #3."

The game show host opens door #3, and you and Larry are $20,000 richer.

Diagram – Four Doors

Appendix D: Questionnaire

Your Impressions

The Boxes and the Coins
Were any parts of the puzzle unclear or ambiguous? If so, what were they?

Were you able to complete this puzzle? If not, what would have enabled you to do so?

Do you have any suggestions for improving this puzzle?

The Heat Lamp
Were any parts of the puzzle unclear or ambiguous? If so, what were they?

Were you able to complete this puzzle? If not, what would have enabled you to do so?

Do you have any suggestions for improving this puzzle?

The Bank Robbers (Ms. Englund, Ms. Finn, and Ms. Lux)
Were any parts of the puzzle unclear or ambiguous? If so, what were they?

Were you able to complete this puzzle? If not, what would have enabled you to do so?

Do you have any suggestions for improving this puzzle?

The Game Show

Were any parts of the puzzle unclear or ambiguous? If so, what were they?

Were you able to complete this puzzle? If not, what would have enabled you to do so?

Do you have any suggestions for improving this puzzle?

Relating it to the Real World

In the puzzles, it was possible to prove the truth of a statement in the following way:
1) Imagine that the opposite of the statement is true.
2) Demonstrate that this leads to a false conclusion.

Example:
(fact to be proven)   *The heat lamp is on.*
(imagine the opposite)   *If the heat lamp was off…*
(demonstrate contradiction)   *… Sherlock Holmes would know that light switch #3 controlled it.*

Do you ever use this strategy to prove things in real life (at school, at work, when you write, when you speak)? If so, try to give a few examples. (Give example sentence(s).)

Appendix E: Refusal Role Plays Data

Coding Key

Conditionals

2	= canonical pattern 2 conditional
3	= canonical pattern 3 conditional
covert	= a covert P-clause
may	= clause whose head verb is the modal "may"
P	= P-clause of a conditional
Past	= clause whose head verb is in the past tense
PastMod	= clause whose head verb is a past tense modal
Q	= Q-clause of a conditional

Refusals

ClrRef	= clear refusal
EWG	= expression of willingness to grant a request
EWG + RTR	= refusal which consists of a EWG followed by an RTR in the same turn
~~EWG~~ + RTR	= refusal which consists of a reason to refuse (and no EWG)
Request	= request
RTR	= reason to refuse

EWG's

(I want…)	= EWG which begins with "I want…"
(I wish…)	= EWG which begins with "I wish…"
(I wouldn't mind…)	= EWG which begins with "I wouldn't mind"
(I'd like…)	= EWG which begins with "I'd like…"
(I'd love…)	= EWG which begins with "I'd love…"
(indirect)	= EWG which is indirect

Dialogue Resolutions

AAFH	= accepts alternative form of help
AAGH	= abandoning the attempt to get help
APTH	= accepts promise to try to help
ASA	= accepts suggestion
RRGG	= re-issues request and gets it granted
(swapping)	= participants agree to temporarily swap a car for the truck

Responses to AAGH's

OffAlt	= offers alternative form of help
Apology	= issues an apology
ExEmpathy	= expresses empathy
FocPos	= focuses on something positive aspect of the refusal
No encouraging remark	= gives no encouraging remark
Positive Eval.	= issues a positive evaluation of the refusal
WishLuck	= wishes the other speaker good luck

Sample Item 1 - $300

Participants		Response	Coded
1 & 2	1:	(Requests that 2 lend her $300)	Request
	2:	(Laughs) Well, yeah. It's a tough situation to be in. (2 second pause) But <u>no. Huh-uh. No way.</u> [ClrRef] (Laughs). <u>I haven't got $300 to loan you.</u> [RTR] You know, you need to talk to your parents about something like this.	ClrRef + RTR
		(1 rejects 2's suggestion to talk to her parents. 2 then suggests that 1 ask her landlord to delay her rent payment a month. 1 accepts suggestion but expresses doubt that it will work. Finally, <u>*2 offers to continue discussing her options over a beer at his house. 1 accepts the offer.*</u>*)*	AAFH
3 & 4	3:	(Requests that 4 lend her $300)	Request
	4:	**Oh, I wish.** [EWG] <u>I have, like, MAYBE $50 in the bank… And… it's just… that's, that's gonna have to cover me for the next… the next two weeks of… gas money and… eating and… going doing things, you know?</u> [RTR] <u>I just don't think I can do it right now.</u> [EIG] Is there any way you can ask your parents or anything?	EWG + RTR (I wish…)
		(4 rejects 3's suggestion to talk to her parents. 4 then suggests that she try to get a loan. 3 says she'll look into that but expresses doubt that she'll be successful.)	
	3:	So… Well, <u>I'll try to figure out something,</u> [ExpPlan] but thanks anyway for trying to help.	AAGH
	4:	I'm sorry. **Maybe if it wasn't two weeks, I might be able to help,** [EWG] but <u>I can't right now.</u> [EIG] …	EWG (P = Past Q = PastMod 2)
5 & 6	5:	(Requests that 6 lend her $300)	Request
	6:	**I'd love to help you out,** [EWG] but <u>I'm pretty stretched myself.</u> [RTR]	EWG + RTR (I'd love…)
	5:	Okay.	
	6:	<u>I'm working, uh, you know, and I've got… gotta lot of, uh, bills myself.</u> [RTR, continued] Um…	
	5:	Well, that's…	
	6:	…can you move in with me for a little while until the semester's over or can I help you out that way? <u>I just don't have the money.</u> [RTR, continued]	
	5:	Yeah. <u>Well, uh, I'll… Let, let me see. I haven't exhausted all of my resources yet.</u> [ExpPlan] I just turned to you first, 'cause I felt like I knew you better.	AAGH
	6:	<u>Well, I really feel sorry. I really, I, I AM sorry,</u> and I hate it for you, but…	Apology
	5:	Well, I appreciate it.	
	6:	I really don't see anything I can do. …	

Sample Item 1 - $300

Participants		Response	Coded
7 & 8	7:	(Requests that 8 lend her $300)	Request
	8:	Oh my Gosh. Yeah. I totally understand your situation, and **I would really love to help**, [EWG] but… I seriously am, like, kind of in the same situation as you. I have… [RTR]	EWG + RTR (I'd love…)
	7:	Oh man.	
	8:	…very little money in my bank account right now, and my paycheck for my job is not coming for another two weeks. [RTR, continued]	
	7:	Okay.	
	8:	So, it's… The next three days… It's kind of… It's kind of a little too soon to… to kind of be able to gather that kind of money. [EIG]	
		(7 explains that she might ask her parents but that she'd prefer not to. 8 suggests borrowing money from someone else and offers to pay that person back in 2 weeks.)	
	7:	Like, maybe, do you think… like, what if I just, like, came clean with the landlord and was just like, "Hey, Jason. Like, I, I just, I, I, like, I need, like, two more weeks. Like, I could even, like, write out, like a, like a, like a contract or something and say, "I will give you this money in two weeks. I just, like, I don't have it right now, but I will." Um, and then that would mean that I would have, like, two more works of… two more weeks of, uh, pay at my job. So, like, probably that would work, right? [PropPlan]	AAGH
	8:	Honestly, I would try that. **I mean, like I said, I would I- be… really want to help you out and everything,** [EWG] because you've been there for me, but it's just really tight right now. …	EWG (I want…)

Sample Item 1 - $300

Participants	Response	Coded
9 & 10	9: (Requests that 10 lend her $300) 10: Aw, man. **You know, any other time I would really love to help you out, I would**, [EWG] but <u>unfortunately… you know how, how strapped I usually am… I can hardly get any pay from my job, and actually, just got paid, but it all went to my own rent.</u> [RTR] And, uck, man. I hate to say this, but <u>I can't help you out.</u> [EIG] I'm really sorry. *(9 requests that 10 borrow the money from someone else. 10 refuses.)* 9: Uh, I understand. Okay. <u>Well, uh, what I'll do then is I believe there's an emergency fund available to me on campus. I didn't want to go through all the paperwork, but, uh, that is an option. And I think our department also has an emergency fund that they keep for students, so I'll check that. And if absolutely necessary, I will go to my parents.</u> [ExpPlan] 10: Okay. 9: Thank you so much for… 10: Sure. Yeah. I've… 9: …listening to my story, and I appreciate your situation as well. 10: Yeah. <u>I've done the emergency loan before. It's actually not that bad,</u> so… …	Request EWG + RTR (I'd love…) AAGH ExEmpathy
11 & 12	11: (Requests that 12 lend him $300) 12: Really sorry to hear about that, man. Yeah, **I would LOVE to help you out**, [EWG] but, <u>like, you know, I got loans and, you know…</u> [RTR] 11: Yeah. 12: <u>… I only work part time as it is. I don't really have any money.</u> [RTR, continued] **If it was a couple of weeks from now, I could probably help you out a little bit,** [EWG] but <u>right now, I'm just so low on funds,</u> [RTR, continued] <u>I just don't think I can.</u> [EIG] *(11 downgrades his request and asks for part of the money.* *12 refuses but offers to try and get 11 a job where he works.)* 11: Hmm, yeah. No, the rent's due pretty soon. Alright, um, I think… Alright. Yeah. <u>I'll, I, I, I'll see, you know, someone else I can ask.</u> [ExpPlan] I appreciate it, man. I'm sorry that I had to ask. 12: No, it's alright. **Like I said, if it was a couple of weeks, I'm sure I could help you out,** [EWG] but right now, <u>I just can't.</u> [EIG] …	Request EWG + RTR (I'd love…) EWG + RTR (P = Past Q = PastMod 2) AAGH EWG (P = Past Q = PastMod 2)

Sample Item 1 - $300

Participants		Response	Coded
13 & 14	13:	(Requests that 14 lend him $300)	Request
	14:	As soon as possible? Um, alright. You said you h-, your rent's due in three days, dude?	
	13:	Yeah.	
	14:	Aw, man. Um. Crap. **I really wish I could help you out,** [EWG] 'cause you've always been there for me. <u>I think like right now, unfortunately, like, I just got my own car sort of fixed up, and it was my girlfriend's birthday, so I blew a bunch of money on that.</u> [RTR] **I wish I would've known.** [EWG] <u>I don't think I'm gonna have… much money… basically none in my bank account 'til, for like another two weeks.</u> [RTR, continued] At THAT point, like, I'd be more than happy to float you whatever you need, but, um, is there any possible way we could, like, maybe talk to your landlord and negotiate? <u>I mean, I know two weeks is a long time, but I just don't think I'm gonna have any money 'til then.</u> [RTR, continued]	EWG + RTR (I wish…) EWG + RTR (I wish…)
		(13 downgrades his request and asks for $50. 14 says he doesn't have the money but <u>promises to call around to some of his friends to see if they can help. 13 accepts promise.</u>)	APTH
15 & 16	15:	(Requests that 16 lend him $300)	Request
	16:	Aw, Gee. Man. **I wish I had it.** [EWG] <u>Uh, my next paycheck's not gonna come in until, I think, like the 28th or something, and that's like two weeks from now…</u> [RTR]	EWG + RTR (I wish…)
	15:	Yeah.	
	16:	<u>…and I'm really, really, really running low. I don't know how I'm gonna be able to make until then myself…</u> [RTR, continued]	
	15:	Aw.	
		(16 suggests that 15 get a loan from the emergency dean's office. At first, 15 ignores this suggestion and requests that 16 come up with some money by pawning something such as his PlayStation. 16 refuses. <u>Then, 15 accepts 16's suggestion to check out the emergency dean's office.</u>)	ASA

Sample Item 1 - $300

Participants		Response	Coded
17 & 18	17:	(Requests that 18 lend her $300)	Request
	18:	**Well, like I said, if I could help you I would.** [EWG] Uh... but if you need more than fifty dollars, I'm… My bank, that's, that's… My, I'm, I'm just about at zero, and I don't get paid for, for two weeks, and, and, uh, I'm just living on a shoestring as is. [RTR] I, I can get, I can drive you around in MY car, but I just don't… have any cash to…	EWG + RTR (P = Past Q = PastMod 2)
		(17 accepts what she perceives to be an offer of $50, but 18 explains that he was mentioning the $50 only to point out how little money he has. Then, 18 again offers to drive 17 around for a while so that she can save on gas money.)	
	17:	Well, I appreciate that. That was really nice, and, um, you know, um, I'll, I've got a few other people I can call, so let me see what I can do, [ExpPlan] and, um, you never know. I may need to, uh, come over and eat a sandwich with you…	AAGH
	18:	(Laughs)	
	17:	…a couple of times if, uh, if that's okay.	
	18:	Sure. I'm, I'm sorry I couldn't do more, but, uh, like, you can't loan what you, what you don't have. …	Apology
19 & 20		*(19 misread his card and thought that he and 20 were roommates and therefore shared responsibility for the rent.)*	
	19:	(Requests that 20 lend him $300)	Request
	20:	Aw, Austin. Gosh. I am down so low. I've got just about nothing left in the account, and… it's gonna be another couple of weeks before I get a, get a check from work. Aw, I just, I don't think I've got anything to spare this month, buddy. [RTR] Now, next month I got a birthday coming up, if I can… If you can get somebody… if you need some… if you can borrow it from somebody and need some help paying it back, you know, next month I could probably LOAN you fifty or a hundred. I've got a birthday coming up, and I'm sure to get some money and have a little extra money then. But right now, I'm just down, um, I'm squeaking to, 'til I get that next paycheck. [RTR, continued]	~~EWG~~ + RTR
		(19 proposes going to the landlord and asking him whether he could pay his half of the rent next month. 20 says that might work and offers to vouch for 19. 19 accepts the offer. 19 says that if the landlord doesn't agree, he can go around and ask other people to borrow money, and as a last resort, he says that he can ask his parents.)	AAFH

Sample Item 2 - Moving

Participants		Response	Coded
1 & 2	2:	(Requests that 1 lend her truck, so that he can move to his new apartment.)	Request
	1:	**Well, I, I would love to help you out**, [EWG] but I'm going camping. I'm actually on the road. [RTR]	EWG + RTR (I'd love…)
	2:	Okay. Great. Um, are you driving your truck?	
	1:	I AM driving my truck.	
	2:	Oh.	
	1:	We're taking my truck, and we won't be back until Sunday evening, [RTR, continued] so **I want to help you out**, [EWG] but I, I've got my truck and it's full of all the camping gear. [RTR, continued]	EWG + RTR (I want…)
	2:	Yeah. Okay. Alright. That… No problem. Uh, what I'll do is I'll just, uh, spring for a big rental truck, and I'll put everything in it, and just leave it in the truck until I can move it into my apartment. [ExpPlan]	AAGH
	1:	When can you move into your apartment again?	
	2:	The second.	
	1:	Hmm. Okay. Alright.	No encouraging remark
	2:	So, Sunday…	
		(1.5 second pause)	
	2:	Yeah. So, you know, if you want to come over and help me unload the truck, feel free.	
		…	
3 & 4	4:	(Requests that 3 lend her truck, so that she can move to her new apartment.)	Request
	3:	Oh dear. Well, I'm out of town. We are camping right now, and I… we just got here, and we were planning on being here for a couple more days… [RTR]	~~EWG~~ + RTR
	4:	Oh.	
	3:	…so I will not be back in town until Sunday. [RTR, continued]	
	4:	Oh.	
	3:	So that puts it into August. [RTR, continued] When do you have to be out?	
		(4 answers that she has to be out tomorrow. 3 suggests that 4 call their friend, Brad. 4 expresses doubt that Brad would be willing to help.)	
	4:	I just, you know, thought maybe, you were closer [than you actually are] and might be able to help.	AAGH
	3:	**Oh, I wish I was, 'cause I would help,** [EWG] but…	EWG
	4:	(Whispering) Thank you.	(I wish…)
	3:	…but sorry.	(P = Covert Q = PastMod 2)
	4:		
		Well, I could also, um, go rent a truck, so maybe I'll do that instead, [ExpPlan] 'cause I don't know where Brad's at right now.	AAGH
	3:	Oh. Yeah. That's a good idea.	
			Positive Eval.

Sample Item 2 – Moving

Participants		Response	Coded
5 & 6	6:	(Requests that 5 lend her truck, so that he can move to his new apartment.)	Request
	5:	Oh. Gosh. Well, um, let's see how we can do this. <u>My truck is at home. I came up with some buddies. But I can't get back there. .. Um, and I've got the keys with me,</u> [reason to refuse, but 5 does not yet realize there is a time conflict. See below] so… hmm…	(5 does not yet realize that there is a time conflict.)
	6:	Well, I mean, I called my landlord to see if I couldn't postpone moving out until my truck got fixed, and I have to be out, because they've rented it, and you know, they've leased it, and somebody has to move in on the first.	
	5:	Oh, okay.	
	6:	Um, so I'm just, um…	
	5:	On the first.	
	6:	Yeah.	
	5:	Oh Gosh.	
	6:	And MY apartment, my NEW apartment's being painted. They won't let me move in early.	
	5:	Mm hm.	
	6:	Um, and it's not going to be ready until the second, so I'm kind of in a bind. Um, but <u>if you're way out there, um, and you've got the keys, there's not much I can do.</u> [withdraws request] Not , not a whole lot. Now, now maybe though… let's look at	AAGH
	5:	this. **I, I really want to help.** [EWG] I, I can't, you know, I can't until… <u>We're coming back Sunday evening, and since I'm with other people, you know, I just can't get back there before then.</u> [RTR] Um, but what about… <u>Oh. SUNDAY evening.</u> [realization that request can't be granted] *(6 confirms what 5 has just realized, i.e. that Keith needs the truck BEFORE Sunday.)*	EWG + RTR (I want…) (5 finally realizes that there is a time conflict.)
	5:	Oh, man. **I really want to help a lot, Keith.** [EWG]	EWG (I want…)
	6:	<u>You know what? You know, I can rent a truck and leave it.</u> [ExpPlan] I was just hoping, um, to not have to go that expense, because moving is an expensive…	AAGH
	5:	Yeah.	
	6:	…in and of itself, but, you know, if I have to do it, I have to do it, so you enjoy your camping trip, and <u>I'll, I'll just take care of it on this end.</u> [ExpPlan, continued] *(5 asks to make sure that he'll still have things to move on Sunday evening. 6 confirms that he will.)*	
	5:	Okay. <u>Well, how about if I get my buddies here to come, we can help you move the stuff in?</u>	OffAlt
	6:	Oh. That'd be awesome. That'd be a big help. …	

Appendix E: Refusal Role Plays Data

Sample Item 2 – Moving

Participants		Response	Coded
7 & 8	8:	(Explains her situation and asks whether 7 will be using her truck over the next few days.)	Pre-request
	7:	Oh, you know what? So, I'm… Actually, I'm not using it, but <u>I'm, like, two hour- two hours outside of town, because Phoebe and Grace and Fran and I are just, like, going camping to kind of relax from the semester, and we took my truck...</u> [RTR]	~~EWG~~ + RTR
	8:	Oooh.	
	7:	<u>…so I don't actually need it, but it's, like, two hours outside of town.</u> [RTR, continued]	
		(8 asks whether the truck is full of camping equipment, and 7 confirms that it is.)	
	8:	Oh man.	
	7:	<u>And we're not going to get back until, like, S- probably not until late on Sunday.</u> [RTR, continued]	
		(8 realizes that 7 won't get back in time to be able to lend her the truck. Then, 7 recalls that their friend Peter is also moving and <u>suggests that 8 split the cost of a truck with him. 8 accepts this suggestion.</u>)	ASA
9 & 10	10:	(Requests that 9 lend her truck, so that he can move to his new apartment.)	Request
	9:	<u>Well, I have a little bit of a fly in the ointment here. Uh, a couple of classmates and I were planning to go camping.</u> [RTR]	~~EWG~~ + RTR
	10:	Oh.	
	9:	<u>Um, we're going to be leaving Thursday, July the 30th, to relax and have some fun before the semester begins, and we were planning on driving back on Sunday.</u> [RTR, continued]	
		(9 and 10 spend several turns clarifying the dates to one another.)	
	9:	Well, um, there're a couple of options. Um, you might be able to find someone else has a truck.	OffAlt
		Sure.	
	10:	**Not that I wouldn't do it,** [EWG] but <u>I've had this other commitment.</u> [RTR, continued]	EWG + RTR (P = covert
	9:	Right. Right.	Q = PastMod 2)
	10:	*(9 suggests the second option she spoke of, which is for 10 to rent a truck. 10 rejects this suggestion, because renting a truck is too expensive. Then, 10 says he might be able to borrow a Subaru Outback from a friend and <u>requests temporarily swapping the Subaru for 9's truck. 9 says it will depend on what her travel companions say but promises to ask them. 10 accepts promise.</u>)*	
			APTH (Swapping)

Sample Item 2 – Moving

Participants	Response	Coded
11 & 12	12: (Requests that 11 lend his truck, so that he can move to his new apartment.)	Request
	11: Yeah, yeesh. God, you know, yeah, <u>the logistics of this really don't work. You know, I'm two hours away, and, and the thing is, you know, you know… we're gonna be here until Sunday actually. We're hanging out here, we're gonna go hiking and stuff,</u> [RTR] so, um… Shoot! I mean, uh, is, is there… Who else could you call?	~~EWG~~ + RTR
	(12 says that he does not know anyone else. Then, 12 says that he can have a friend drive him out to the campsite and re-issues the request to borrow the truck and offers to buy 11 and his friends some beer. 11 rejects this request. Then, 11 suggests that 12 rent a moving truck.)	
	12: Yeah. So, like, you know, I can get a truck for, like, Friday through Sunday, but it's going to cost, like, a hundred bucks, so I was really trying to find something that would be more cost-effective. You know, I'd put fuel in it, that sort of thing. Um, you know, I could get you a little something, but you know, if you can't, I guess you can't, so…	
	11: Yeah, no. I'm sorry, man. <u>I, you know, we're going to be… we're going to be using it throughout the weekend,</u> [RTR] so…	
	12: Okey Doke. Alright. <u>Well, thanks anyways, man.</u> [ExpThnks] You guys have fun, and, uh, maybe I'll see you guys when you get back.	AAGH
	11: Cool. Yeah. <u>Good luck finding something.</u> …	WishLuck
13 & 14	14: (Requests that 13 lend his truck, so that he can move to his new apartment.)	Request
	13: Aw, man. **I wish I could help**, [EWG] but, <u>uh, like, I'm out camping with a bunch of buds out here. And uh, you know, we're all set up here. We, we're just gonna hang out here until Sunday.</u> [RTR]	EWG + RTR (I wish…)
	14: <u>Fair enough, dude.</u> [Eval] <u>I, I really appreciate it.</u> [ExpThnks] I mean, sorry. I wish I could've made it camping. (Laughing) I think that would've solved my problem right there. Do you know, you don't know anybody else we both know around that might happen to have a truck, do you?	AAGH
	(13 says that everyone he knows has cars.)	
	14: Cars. Sweet. Sweet. Um, okay, so let me see. If I got to have it out tomorrow, I'd have to move it, so even if you were coming back before the second, I don't think it would really make a difference. Well, I'm sorry to bother you out cam-	
	13: Yeah. <u>Sorry.</u>	Apology
	14: Yeah. Sorry to bother you guys out camping, man. My bad.	
	13: Alright. Good luck!	

Sample Item 2 – Moving

Participants	Response	Coded
15 & 16	*(At the very start of the conversation, 16 learns that 15 is camping this weekend.)* 16: (Asks 15 if he knows anyone with a pickup truck.) 15: Yeah, I see. Well, actually, you know, I DO have a pickup. It's just… 16: Yeah, I knew you did, but you're going camping, [RTR] so… 15: Well, actually, we're camping right now. I'm, I'm at… [RTR] 16: Oh. 15: …the campsite this… I got there this morning. [RTR, continued] 16: Oh, okay. 15: And it's about two hours away from town. [RTR, continued] **I would, I would help you out,** [EWG] but I, I can't get back into town right now. [RTR, continued] *(Note that in this example, 16 never actually makes a request. Therefore, to be precise, 15's EWG + RTR is not a refusal, but rather an explanation of his failure to offer.)* *(15 offers to help Sunday evening, but 16 says that he needs to move out on Saturday. 15 suggests that 16 store his stuff in a neighbor's house and re-issues his offer to help on Sunday. 16 accepts the suggestion and the offer.)*	Request [Actually, this a request for information, but 15 treats it a request.] EWG + RTR (P = covert Q = PastMod 2) AAFH
17 & 18	18: (Requests that 17 lend her truck, so that he can move to his new apartment.) 17: You know what, Mickey. Uh, I don't know if you can hear all the nature sounds around me, but, um, I'm, like, camping this weekend. [RTR] 18: Oh! 17: Um, I just arrived here at the campsite, and I'm not going to be back in town for, like, three days, and, um… Gosh, it's, you know, I'm two hours away, [RTR, continued] so I, um, I don't know. Um… *(17 suggests that 18 have a friend drive him out to the campsite and offers to temporarily swap her truck for that person's car. 18 accepts the offer.)*	Request ~~EWG~~ + RTR AAFH (Swapping)
19 & 20	20: (Requests that 19 lend her truck, so that he can move to his new apartment.) 19: **Annette, I would love to loan you the truck and I would love to help you and I would love to do everything**, [EWG] but I'm two hours away at, uh, Big South Fork, uh, Area, and I'm camping with three of my friends. We plan to stay until Sunday evening. [RTR] I don't know what to do about it. *(20 says she might be able to have a friend give her a ride out to the campsite and requests that 19 temporarily swap the truck for that person's car. 19 grants the request.)*	Request EWG + RTR (I'd love…) AAFH (Swapping)

Sample Item 3 – Subbing

Participants		Response	Coded
1 & 2	1:	(Requests that 2 substitute for another teacher)	Request
	2:	I don't see how.	
	1:	Why?	
	2:	Well, I told a friend of mine I'd pick him up at the airport. It's a two hour drive to the airport. Two hours there, two hours back. [RTR] **You know, I… At this… You know, otherwise if I had known earlier, I probably could've worked it out. Somebody else could've picked him up.** [EWG] But as it is, I, I don't… I don't think there's any way. [EIG] You know, I could, I could try asking some people.	RTR + EWG (P = Past Q = PastMod 3)
	1:	Mm hm.	
	2:	…But I'm seriously doubting it.	
		(1 follows up by asking 2 to try and find someone else to pick up his friend at the airport. 2 promises to try but expresses doubt that he will be successful and suggests that 1 should teach the class. 1 rejects this suggestion, and then 2 criticizes her leadership ability. 2 promises to try and find someone else to pick up his friend and says he will call by 7:00 with a definite answer. 1 accepts promise. Then, 2 suggests that 1 should continue looking for another substitute. Finally, 1 leaves the room with loud steps.)	APTH
3 & 4	3:	(Requests that 4 substitute for another teacher)	Request EWG + RTR (Indirect)
	4:	**You do know how much I love this place,** [EWG] but (laughs) my friend from Florida's coming in, and I haven't seen her in almost a year… [RTR]	
	3:	Aw, man.	
	4:	…and the airport's two hours away, and I'll probably be gone for most of the day, and her flight is… comes in about eleven, I think. [RTR, continued]	
	3:	(exhales)	
	4:	So… (exhales)	
	3:	Well, alright. I completely understand. I just thought that since you were qualified that, you know, you might be willing to pick it up and get some extra money and…	
		(4 offers to help in the future. 3 accepts offer. 4 also suggests asking Darren. 3 expresses doubt that Darren is qualified but says that she'll look into it.)	ASA

Sample Item 3 – Subbing

Participants		Response	Coded
5 & 6	5:	(Requests that 6 substitute for another teacher)	Request
	6:	**Well, I'd love to really help you out. I really would,** [EWG] but um, but I've already, um, I've already got plans that I can't get out of. I've got a friend that's counting on me to pick them up at the airport, and it's about two hours away, and [RTR]…	EWG + RTR (I'd love…)
	5:	Mm hm.	
	6:	I already communicated to him and [RTR, continued]…	
	5:	Mm hm.	
	6:	…won't have any other communication until we, uh… until I'm actually at the airport, so [RTR, continued]… *(Over the next several turns, 5 asks questions to verify that there is indeed a time conflict.)*	
	5:	Alrighty. Well, it was a good try. I, I guess it looks like principal to the… (laughs) to the head of the class again. [ExpPlan] **Aw, I'd love to help you out** [EWG] and, and hate that I can't,	AAGH EWG (I'd love…)
	6:	but **if I hadn't made these plans, I'd, I'd be there in a flash.** [EWG] …	EWG (P = Past Q = PastMod 2.5)
7 & 8	7:	(Requests that 8 substitute for another teacher)	Request
	8:	**I would love the opportunity to be able to teach this class, and if it were any other weekend, I would be able to,** [EWG] because I'm usually always here. But unfortunately, tomorrow, one of my friends from undergrad is coming in to visit. [RTR] Oh, okay.	EWG + RTR (I'd love…) (P = were Q = PastMod 2)
	7:	So, I have to drive down to Chicago, because she's flying into	
	8:	O'hare, and her flight doesn't get into until about eleven thirty, so I was planning on leaving here at about nine, and I probably would be gone for most of the day, because it's gonna take another two hours to get back. [RTR, continued]	
	7:	Okay.	
	8:	But I'm really sorry. **I would, I would honestly be able to su-… and if it was any other Saturday…** [EWG]	EWG (P = covert Q = PastMod 2)
	7:	Okay.	
	8:	**Most definitely.** [EWG, continued]	
	7:	Alright. Well, okay. So, um, I guess that won't work. Maybe, maybe I can take the class this Saturday, I think. I guess I'll… I guess I'll be able to cover for her, for Julie. [ExpPlan] Okay, well, thanks very much for…	AAGH
	8:	Yeah. No. Thank you for actually thinking of me. And honestly, any other Saturday, if, if any of them get… come down with the swine flu or something, you let me know, 'cause I would definitely be willing to do it. …	OffAlt

Sample Item 3 – Subbing

Participants		Response	Coded
9 & 10	9:	(Requests that 10 substitute for another teacher)	Request
	10:	Oh. Uh, I, I… Thank you for the compliment, and **any time, any other time I would be very happy to do so.** [EWG] <u>Unfortunately, I've, uh, I've already made a commitment to pick up my friend at the airport, and you know, it's a couple of hours away. And they're going to be stranded if I can't make it. I'm not sure how I can really get out of this, 'cause there's not really any good service from the airport here anymore.</u> [RTR]	EWG + RTR (P = Covert Q = PastMod 2)
		(9 follows up by offering to have the school pick up 10's friend at the airport, so that 10 can teach the entire class. 10 accepts and agrees to teach the entire class.)	RRGG
11 & 12	11:	(Requests that 12 substitute for another teacher)	Request
	12:	Aw, man. **I'd really like to.** [EWG] Well, I wouldn't say I'd "like" to.	EWG + … (I'd like…)
	11:	(laughs)	
	12:	But, **like, I wouldn't mind normally**, [EWG] but <u>my buddy's coming into the airport, you know, over in Peoria, so it's a couple of hours away. I told him I'd go pick him up, so, you know, by the time I get over there, pick him up, and be back, I'll be gone most of the day.</u> [RTR]	EWG + RTR (I wouldn't mind…)
	11:	And, I, I, I just wanted to say this. I mean, the thing is… actually, I don't think we have another option for this, because we have a couple people, um, who already know can't do it. Um, this flu's going around, people are sick, and really, actually, you know, I, and I didn't want to ask you. I know, uh, you know, I don't want to make you do any work that isn't necessary, but for this, actually, you're kind of our last option. <u>Is there any way you could arrange something where, uh, you could have a friend pick up the… your friend from the airport?</u> [Request which addresses the reason to refuse which was mentioned in the last turn]	Request
		I'd really like to, [EWG] but <u>um, you know, I'm kind of stuck. I already said I'd do it. Basically, he's coming in, 'cause his mom is really sick, so…</u> [RTR]	EWG + RTR (I'd like…)
	12:	I'm sorry to hear that.	
	11:	<u>You know, it's not, not so much for like a fun trip.</u> [RTR, continued]	
	12:	**If it was a fun trip, I could probably be like, "Hey, grab a cab, and we can split the cost." or something like that.** [EWG] But, <u>um, I'm trying to pick him up and take him out to the hospital, so…</u> [RTR, continued]	EWG + RTR (P = Past Q = PastMod 2)
	11:	Well, uh, you know, and, and, uh, well, I, you know, <u>I guess, I guess we'll have to cancel Saturday class.</u> [ExpPlan] I just wonder, well… <u>I can call the teachers, I suppose…</u> [ExpPlan, continued]	AAGH
		(12 offers to help if they are able to reschedule the class. 11 accepts the offer but expresses doubt that they'll be successful.)	OffAlt

Sample Item 3 – Subbing

Participants		Response	Coded
13 & 14	13:	(Requests that 14 substitute for another teacher)	Request
	14:	Yeah, um, **I'd love to Bill.** [EWG] But did, did you say tomorrow, Mr. Dolbert?	EWG + …
	13:	Yeah.	
	14:	Yeah, um, <u>the thing is I promised my friend I would pick them up at the airport tomorrow, and it's two hours away.</u> [RTR] I mean, Julie's always been… always such a huge help to me, and like, you've always been a great principal to work for, so I feel really bad, but <u>I just, I don't think I can do it tomorrow.</u> [EIG] Is there any way we can move it… if, if you could have the students maybe come in on Sunday or something, I could do it, but <u>I just think it's too short a notice for me to cancel right now on my friend,</u> [EIG] and <u>I don't know how they'd get here</u> [RTR], so…	… + RTR (I'd love…)
		(13 rejects 14's suggestion to move class to Sunday, because many students attend church. Then, 13 requests that 14 have someone else pick his friend up. 14 refuses but <u>offers to teach the class at a later time of the day on Saturday. 13 accepts 14's offer</u> but expresses doubt that he'll be able to reschedule the class. 14 then says to let him know if he can help in any other way.)	AAFH
15 & 16		*(15 and 16 greet one another, and 15 immediately learns that 16's friend Philip is coming to visit him this weekend.)*	
	15:	(Requests that 16 substitute for another teacher)	Request
	16:	Well, actually, yeah… I'm thinking what time Philip's flight… <u>his flight arrives at, like, uh, like noon, and so I told him I'd be there when he arrived, and so, really, I was planning on leaving here around nine o'clock,</u> [RTR] but…	~~EWG~~ + RTR
		(15 acknowledges that there is a time conflict and then lets 16 finish his thought. <u>Then, 16 offers to prepare a lesson plan and email it to 15, so that 15 can teach the class. 15 accepts this offer.</u>)	AAFH

Sample Item 3 – Subbing

Participants		Response	Coded
17 & 18	17:	(Requests that 18 substitute for another teacher)	Request
	18:	Well, I appreciate the confidence, and **I WOULD like some extra money,** [EWG] 'cause first year teachers sure can use it, but I've already committed to picking a friend up at the airport, [RTR] and **if I hadn't made this commitment first, I, I would've... I don't know what I would've done,** [short-circuited EWG?] but, uh... but I, I, I've, I can't... uh, no one else knows her [RTR], uh... You don't think anybody could pick her up for you? [Request which addresses the reason to refuse which was mentioned in the last turn]	EWG + RTR (I'd love…) EWG + RTR (P = Past Q = PastMod 3)
	17:	No, I'm afraid not. It's, It's two hours away, and, and she's really doesn't know anyone else. And she's only going to be in the town for the weekend, so I really want to... [RTR] **Uh, I wish I could help out.** [EWG] It's not easy for me to say no, I can't help, when I've only been here three months. Uh, I just can't this time. [EIG] ...	Request
	18:		EWG + EIG (I wish…)
		Well, I, I, you know, I can come in. (clears throat). I can come in and handle the situation. [ExpPlan] I just, uh, thought maybe that, um, you know, since you are kind of new to the school and you might like to get your feet wet in something, you know, like... **If, if I'd been free, I would've jumped at the chance, Angie.** [EWG] ...	AAGH
	17:		
	18:		EWG (P = Past Q = PastMod 3)
19 & 20	19:	(Requests that 18 substitute for another teacher)	Request
	20:	Aw, M- Mr. McKinley. I've got a commitment. I promised my friend that I'd pick her up at the airport. Aw, unfortunately, it's the airport up in Cincinnati. [RTR] Aw, so that is, uh, going to knock me out. [EIG] I think her flight gets in, like, at one o'clock, so... two hours up there, [RTR] and, uh, uh, I'm so sorry. Have you, is it, is it s- did she, did she leave a lesson plan? Can we get somebody, even if they're not, not qualified?	~~EWG~~ + RTR
	19:	Well, you have to... This, this class, uh, if they don't have a qualified teacher for all the classes, they don't credit, they don't get credit for the class, so... Uh, actually, it's not your fault. I'm not, that, you know, you can't do it, and of course, it's the last minute. I just wish other teachers weren't sick, but, uh, I suppose that we'll have to rethink this. I think I'll get the, uh, school secretary to, uh, try to call the, uh, students that she can reach and tell them that the class will not meet tomorrow, and, uh, put a sign on the classroom door: "Due to illness, this class will not meet today. Sorry for the inconvenience. We'll reschedule the class." [ExpPlan]	AAGH
		(20 goes on to offer to help should they end up rescheduling the class. 19 accepts offer.)	OffAlt

Sample Item 4 – Day Off

Participants		Response	Coded
1 & 2	2:	(Requests to take Friday off for his son's ball game.)	Request
		(1 spends several turns getting 2 to concede that this is a very important contract.)	
	1:	Um, and… (clears throat) your request is a very good one, and **normally, I wouldn't have a problem with that at all.** [EWG] However, um, there's no one that's going to be able to know the campaign as well as you in that time, because you created it, it's your workmanship, it's your baby, so to speak. [RTR] Um, I can't give you the day off. I, I just wouldn't be able to do that, because of the company… [EIG]	EWG + RTR (P = Covert Q = PastMod 2)
		(1 then conditionally offers to let 2 leave early, provided an opportunity presents itself.)	
	2:	Well, you know… I can't remember right off when it's scheduled, you know, the time…	
	1:	Mm hm.	
	2:	…but I'll find out, and um… you know, if it comes down to it, I'll skip the game. You know… um, or I'll make it there for the last half of the game, which'll be good enough. [ExpPlan]	AAGH
	1:	Okay.	
	2:	You know.	
	1:	Okay, and again, I, you know, I apologize, because, you know, **I'd love to grant this request,** 'cause it's a really good one, [EWG] and I'd hate for anyone to miss this, because it's important. However, this presentation… We probably won't be able to get the contract without you, because you're the only one that knows the campaign. [RTR] …	EWG (I'd love…)
3 & 4	4:	(Requests to take Friday off for her son's ball game and to have someone else give the presentation.)	Request
	3:	I completely understand you wanting to take off, and that is a totally acceptable reason…	
	4:	Mm hm.	
	3:	…but this is a huge, huge account and a huge campaign, and we have to have it perfect… [RTR]	~~EWG~~ + RTR
	4:	(Whispering) I know.	
	3:	…We've got to have you on there. You know it forwards, backwards, inside, outside. We've got to have you on this, uh, campaign. [RTR, continued] You know…	
		(4 requests to have someone else give the presentation. 3 refuses. Then, 3 offers to let 4 out of the presentation early, provided VMW does not mind and suggests that 4 call VMW and check whether they could come in at an earlier time. 4 accepts this offer.)	AAFH

Sample Item 4 – Day Off

Participants		Response	Coded
5 & 6	6:	(Requests to take Friday off for his son's ball game and to have his coworker, Marger, give the presentation.)	Request
		Keith, I don't think anybody else in the company knows this campaign well enough to do this. You know it. It's your baby. You've done it from the ground up. [RTR] Let's, let's put our heads together. Let's think about this. This is important, and your son's important too.	~~EWG~~ + RTR
		(6 asks if the meeting can be rescheduled. 5 says no. Then, 5 offers to let him videotape the presentation in advance provided he makes himself available for questions via cell phone. 6 accepts this offer.)	
7 & 8	8:	(Requests to take Friday off for his son's ball game and to have his coworker, Susan, give the presentation.)	Request
	7:	You know… You know what. **If this were any other company… you know, if this were any other company,** [EWG; false start] you know I, I… You do really excellent work	EWG + … (P = were Q = … 2)
		for, for us, and **if this were any other company other than VMW, I would, I would say yes in a heartbeat,** [EWG] but… you know, this is a really, this is a really, really big co-… I mean, our… I don't know if we're going to… if we don't get this contract, I, I'm not sure if we're going to be able to, to survive the- this economic downturn. I, I… This is, like, pretty serious for us, [RTR] and I, I just don't think that… [EIG; false start] **I, I, I, I really want to say yes,** [EWG] but I don't think that that's going to… that's… I don't think that that's a possibility. [EIG] You're really the only one who can, who can pull off this presentation, and I would feel r- r- really uncomfortable kind of giving it to, to somebody else on your team who's, like, not as experienced and, like, not as authoritative, and we, we really need to get this contract. [RTR]	EWG + RTR (P = were Q = PastMod 2) EWG + RTR (I want…)
		(8 does not accept the refusal and asks if she can have Susan give the presentation. 7 refuses. 8 re-issues the request. 7 refuses again.)	
	8:		
	7:	Okay. Thank you. [ExpThnks]	AAGH
		Yeah. I'm sorry about that. Good… You know, give him my best, and tell him good luck in the game. …	Apology

Sample Item 4 – Day Off

Participants		Response	Coded
9 & 10	10:	(Requests to take Friday off for his son's ball game and to have his coworker, Sarah, give the presentation.)	Request
	9:	Well, I understand your situation, Jack. However, uh, you know I've always been flexible, but <u>I think, in this case, we're not going to be able to allow that.</u> [EIG] <u>Uh, this is a top-notch company. This would mean a lot for the company…and eventually for you as well. Um, I know, uh, we've been partners in this, uh, for a long time, and we're just now getting, beginning to see a real, uh, growth in the company, and this is an extremely important, pivotal, uh, meeting. Uh, granted, uh, your coworker is doing extremely well, but they aren't seasoned enough to be able to handle this high level of a meeting,…</u> [RTR]	~~EWG~~ + RTR
	10:	Mm hm.	
	9:	<u>And, uh, this is a real pivotable [sic], pivotal, um, presentation, and bottom line is we need you there.</u> [RTR, continued]	
		(10 requests permission to give the presentation using video-conferencing. 9 refuses. Then, 10 requests that the presentation be moved to Saturday. 9 refuses.)	
	10:	Okay. Alright. I understand. <u>Sounds good.</u> [Eval]	AAGH
	9:	Okay. <u>Well, thanks. We really appreciate your doing that, and, uh, I'm sure we'll receive the reward for it in the near future.</u>	FocPos
11 & 12	12:	(Requests to take Friday off for his son's ball game and to have his coworker, Mike, give the presentation.)	Request
	11:	Yeah, listen. You know, I understand. Yeah. One, I'm just very happy for Seth. <u>Um, how-, you know, this is a really important account. You have to realize it's the V-… and it's something where we need our best person, and you're our best person. You know, you're the one who's best equipped to give the account, so I… to, you know, to be honest, I think it's, it's just too important,</u> [RTR] and, um, you know, like, I, I, I think your son, uh, you know, I'm happy for him, and **I, and I wish I could help you out, and if it was a different day, it may be differently,** [EWG] but <u>it's just too important for you to be there.</u> [RTR, continued]	~~EWG~~ + RTR EWG + RTR EWG + RTR (I wish…) (P = Past Q = may 2.5)
	12:	Alr- Alright. And <u>I, I tried to preface it to him, telling him I, I wasn't sure I'd be able to get out of it, but I, I just wanted to ask, 'cause, you know, why not try, at the very least?</u> [expresses that refusal was expected]	AAGH
	11:	You know, listen. <u>You know, I think you're going to do a great job, and that's why I think it's so important,</u> so, um, yeah, uh, you know, hopefully we can get a call from him. Good luck in the State, but, uh, yeah. <u>No, I, I think you're going to do good with this account,</u> so want you to be there.	FocPos
	12:	Alright. Okay. <u>Well, I'm going to go call him and let him know to make the hotel plans without me.</u> [ExpPlan]	
	11:	Okay.	

Sample Item 4 – Day Off

Participants	Response	Coded
13 & 14	14: (Requests to take Friday off for his son's ball game and to have someone else give the presentation.)	Request
	13: Aw, Ted. I don't know.	
	14: (Laughs)	
	13: <s>It's a…</s> I mean, it's such, like, an important presentation. I mean, this is a really big contract for us, and y-, I mean, you know all the in's and out's on it, so… [RTR]	<s>EWG</s> + RTR
	14: Yeah.	
	13: …I, I think I'm really going to need you here for that. [RTR, continued]	
	14: Yeah. Well, I mean, I guess I understand, Bill. If I could just, you know what I mean? You have kids. I mean, if it's an absolute mandatory thing, I will absolutely come here, and I understand the importance of it, but, you know, it's been tough at home lately. We've been working these extra hours with the design advertisement. I think my son would really appreciate it, and I know my wife really would as well, so <u>if you think there's any other way we could do it, I'd really appreciate it.</u> [reissues the request] Otherwise, I'll just come in and do the presentation.	Request
	13: Yeah, you know, I… Yeah, you know, I have kids too, and **I would, I would really like to,** [EWG] and, I mean, there's other people around who might, you know, might do it. <u>But you know how these presentations go. It's always, like, you know, you know these designs inside and out, and sometimes the clients'll ask something…</u> [RTR]	EWG + RTR (I'd like…)
	14: Yeah.	
	13: <u>…and they want a quick answer (Snaps fingers several times), and you have all that right, you know, right at your hand,</u> [RTR, continued] and, and <u>I just can't, I mean, just, I just can't risk that now.</u> [EIG] <u>It's such an important contract,</u> [RTR, continued] so…	
	14: I, I understand.	
	13: I mean, I know it's tough on your family and everything, but you know…	
	14: Yeah.	
	13: Once, once, once we've done this, it'll be over. Things'll get back to a little bit t- normal, but I mean, <u>I really got to have you here for next Friday, man.</u> [RTR]	
	14: Okay. <u>I'll be here.</u> [ExpPlan] Thanks a lot, Bill. I just wanted to run it by you and see, and thanks for listening.	AAGH
	13: Alright.	No encouraging remark

Sample Item 4 – Day Off

Participants		Response	Coded
15 & 16	16:	(Requests to take Friday off for his son's ball game and to have his coworker, Marsha, give the presentation.)	Request
	15:	Dave, I know, I know, uh, I know that you really have your heart for this, uh, this, this, uh, project, and I know that Marsha is a good employee, but <u>the truth is that she doesn't know this project like you do. And, um, I've seen her give presentations before, and, and really, it's just not up to par. This is a big, heavy hitter, uh, company here, from Germany, and we need this, uh, this, uh… you know, in order to stay in business. These times are tight.</u> [RTR]	~~EWG~~ + RTR
	16:	Yeah. It's true.	
	15:	So, what I'm, I'm going to have to say to you, I'm, I'm really sorry, but it's… <u>I, I, I don't see another way, but we need you there at the presentation this Friday.</u> [RTR, continued]	
		(16 requests that the presentation be rescheduled. 15 refuses.)	
		Well, I guess, uh, I guess he'll have a… I don't know. Well, alright.	
	16:	I understand.	
		Yeah. Well, I'll… I mean, I know you'll do it right… what's right. I	
	15:	mean, you, you've been with us a long time here. It'd be a… you know… You'll be there, right?	
		Yeah, <u>I will.</u> [ExpPlan]	
	16:	Okay. Good.	AAGH
	15:	Yeah.	
	16:	<u>Tell your son I'm sorry.</u> Uh, I'm… Hopefully, he makes the finals,	
	15:	and then you can see him at the… This is the finals?	Apology
		…	
17 & 18	18:	(Requests to have the VMW presentation moved to an earlier time on Friday so that he can attend his son's ball game.)	Request
	17:	<u>Well, uh, you know, this is such an important contract for our company, and you have been the lead person on it. We've, uh, you know, given you the responsibility, and we've felt good about how you've handled everything so far. Um, and I don't really want to jeopardize, um, the meeting by trying to reschedule and I'd just like for it to remain the way it is, you know, so that we are all, you know, feeling good about getting this contract signed, and, um, uh, it's, it's just, uh… I don't know. I think we need to just leave the meeting as is.</u> [RTR]	~~EWG~~ + RTR
	18:	Yeah. Well, I, I, I understand. <u>I thought it was worth a shot.</u> [expresses that refusal was expected] <u>Uh, I'll be disappointed,</u> [ExDisappointment] but I, I do take my job seriously, and, uh, you're right on all counts. Uh…	AAGH
	17:	Well, <u>maybe you can explain to your son that, you know, HE'S on a winning team, and YOU'RE on a winning team, and sometimes, you know, you just have to play a role.</u>	FocPos
		…	

Sample Item 4 – Day Off

Participants		Response	Coded
19 & 20	20:	(Requests to take Friday off for her son's ball game and to have her coworker, Jackson, give the presentation.)	Request
	19:	(Exhaling) Oh boy. <u>You know how important that is, Annette. That's, that's almost a make-or-break. We have to get that contract, and I really feel like that you should be the one to give it.</u> [RTR] Uh, it's in the early afternoon. Could you just do the, do the thing and then take off for Ashland?	~~EWG~~ + RTR
		(This question results in a long negotiation. By the end, <u>19 offers to let 20 leave in the early afternoon, provided all important aspects of the presentation and Q & A have been addressed. 20 accepts this offer.</u>)	AAFH

Appendix F: Logic Puzzles Data

Coding Key

0	= canonical pattern 0 conditional
1	= canonical pattern 1 conditional
2	= canonical pattern 2 conditional
3	= canonical pattern 3 conditional
covert	= a covert P-clause
DTA	= conditional which is a case of "denying the antecedent" (type of logical fallacy)
must	= clause whose head verb is the modal "must"
no verb	= clause which has no verb
NP =	= P-clause expressed as a noun phrase
otherwise	= P-clause implicitly conveyed by the word "Otherwise"
P	= P-clause of a conditional
Past	= clause whose head verb is in the past tense
PastMod	= clause whose head verb is a past tense modal
PBC	= response contains a proof-by-contradiction
~~PBC~~	= response contains no proof-by-contradiction
Pres	= clause whose head verb is in the present tense
PresMod	= P or Q clause whose head verb is a present tense modal
Q	= Q-clause of a conditional
was	= P or Q clause whose head verb is "was"
were	= P or Q clause whose head verb is "were"
were to	= P or Q clause whose head verb is "were" followed by "to" + (verb)

Sample Item 1 - Coins

Participant	Response	Coded
1	[Left item blank]	~~PBC~~
2	**If box 1 were labeled correctly, we could infer that boxes 2 and 3 were both incorrectly labeled**, thus making box 3 the 10¢ box.	PBC P = were Q = PastMod 2
3	You had to have heard two coins banging together to make noise whereas 1 coin alone would not make that noise.	~~PBC~~
4	**If box A contained 5¢, then Box B + C would have to be mislabled [sic], and there would be 15¢ in B + 10¢ in C.** But as he doesn't know what is in Box C, Box A must be mis-labled [sic].	PBC P = Past Q = PastMod 2
5	**If Box A did contain 5¢ then Sherlock would know that Box B & C had been mislabeled**	PBC P = Past Q = PastMod 2
6	**If box A had 5¢, S.H. wd. know** If box A had 10¢, box C could be 5¢ or 15¢ } so S. H. If box A had 15¢, box C cd. be 5¢ or 10¢ } wouldn't know	PBC P = Past Q = PastMod 2
7	Because **if it contained 5¢, then we could say for certain that the labels on Boxes B + C are labelled [sic] incorrectly.** With A not containing 5 cents, we still don't know about the other two boxes.	PBC P = Past Q = PastMod 2
8	Because **if Box A contained 5¢ then Holmes would know that both of the other 2 boxes are mislabeled.** However if he has opened 1 mislabeled box, he doesn't know if the other 2 are both mislabeled or only 1.	PBC P = Past Q = PastMod 2
9	**If box A contained 5¢, then its label would be correct, so the other two labels would be false, and Box B would contain 15¢ and box C 10¢.** However, if Holmes doesn't have enough info, it means box A has a false label, meaning one <u>or</u> both of the others may have a false label as well.	PBC P = Past Q = PastMod 2
10	**If A really had 5¢, then both B + C would have had to have incorrect labels, so that means C would definitely have been 10¢. Thus, Sherlock would have known the answer.**	PBC P = Past Q = PastMod

Sample Item 1 – Coins

Participant	Response	Coded
11	**If box A contained 5¢, then the label would be correct, and that would mean that labels of both B and C are incorrect. From that, Sherlock would've deduced that B has 15¢ and C has 10¢.** But Sherlock didn't know, so box A label must be false,	PBC P = Past Q = PastMod2
12	**If box A had 5¢, the B & C must be labelled [sic] incorrectly, & box C would have to contain 10¢.** However, if box A contains eithe[r] 10¢ or 15¢ then <u>either</u> B or C could have the incorrect amount,	PBC P = Past Q = must
13	**But if it had 5¢, then its label would be correct, and then Box B + C would both have to be incorrect.** [at bottom] Sorry, I can't figure this out!! ☺ ☹	PBC P = Past Q = PastMod2
14	**If Box A did contain 5¢, then he would know by default that the other 2 labels were false, since at least 2 are false, and he would know that B had 15, and C had 10.** Since he does not know, Box A's label must also be false.	PBC P = Past Q = PastMod2
15	**If box A contained 5¢, it would be correctly labeled, meaning both B and C must be incorrectly labeled, so Sherlock would then know that Box C contained 10¢.** Since he did not know that, Box A must be incorrectly labeled.	PBC P = Past Q = PastMod2
16	**If Box A contained 5 cents, Sherlock would have known that the other two boxes had incorrect labels, since Box A would have been right, leaving 2 incorrect labels as the only possibility. Thers [sic], he would have known that Box C was incorrectly labeled, and therefore had 10 cents.** Since he didn't know that, I know Box A did not contain 5 cents.	PBC P = Past Q = PastMod
17	Because **otherwise you would know box C would have 10¢ in it.**	PBC P = otherwise Q = PastMod2
18	Only one box contains 5¢ and it is box C. Labels on Box A, B & C are wrong.	~~PBC~~
19	**If Box A had 5¢ in it, he would know the other 2 boxes were incorrectly labeled. So then he would know Box B has 15¢ and Box C has 10¢.** But since he didn't conclude that after looking in Box A, Box A must NOT have 5¢ in it. So he still needs more information.	PBC P = Past Q = PastMod2
20	BECAUSE **IF IT DID THEN b = 15 + c = 10 AND HOLMES WOULD KNOW** [at bottom] IF = 5 THEN a CORRECT + B + C ~~UNKNOWN~~ WRONG [unreadable] C	PBC P = Past Q = PastMod2

Sample Item 2 – Switches

Participant	Response	Coded
1	On – perhaps I hit switch #3 while they were inside Room 3, then turned it off again quickly to see the room temp – if it has increased or changed from his 1st attempt.	~~PBC~~
2	On [Conclusion], if switch 3 were flipped (or all of them), we couldn't infer that he knows the answer, or could have even thought about it. **If the heat lamp was off, he would know it was three (switch) that turned it on.** Since he didn't know which turned it on, it must be 1 or 2.	PBC P = were Q = PastMod 2
3	If the temperature in room 2 was the same as room 1 since Sherlock couldn't tell a difference, then you know that switch 2 had heated the cold room up to the current temperature of room 1.	~~PBC~~
4	[written above question] 1, 2 on 3 off When S goes in Room [below question] It's on because he knows that switches 1 + 2 are turned on + 3 is off. **If switch 3 controlled the lamp, then the light would be off in the room + he would know that 3 controls it.** But as he doesn't know, <u>1 or 2 must control it.</u> [Conclusion] [Since 1 and 2 are on, the light must be on.]	PBC P = Past Q = PastMod 2
5	On – **if the heat lamp was controlled by 3 he would know** because 3 was off and the lamp would be off. → He didn't know because the lamp was on and <u>either [of the other] 2 switches could have turned it on.</u> [Conclusion]	PBC P = was Q = PastMod 2
6	**If lamp off, it wd. be switch 3 for sure.** Since S.H. didn't know which switch, <u>lamp must be on</u> [Conclusion] + switch 2 must have turned it on.	PBC P = no verb Q = PastMod 2
7	<u>It is on.</u> [Conclusion] Because the heat lamp is on but he doesn't know if it is switch 1 or 2. **If the heat lamp was off, he would know that switch 3 controls it.**	PBC P = was Q = PastMod 2
8	<u>The heat lamp is on</u> [Conclusion] because **if it was off, that would mean the third switch controls the lamp.**	PBC P = was Q = PastMod 2
9	<u>The heat lamp must be on,</u> [Conclusion] because **if it was off, then neither switch one or two would control it, so it would have to be switch three.** If it's on, he can't know if 1 or 2 made it that way.	PBC P = was Q = PastMod 2

Sample Item 2 – Switches

Participant	Response	Coded
10	The heat lamp is on. See diagram below! 1) ~~1 hot → 2 not~~ 2) 1 not → 2 hot 3) ~~2 hot → 1 not~~ 4) ~~2 not → 1 hot~~ [Afterwards, participant explained this was a proof by cases. Notation: "→" - indicates order in which switches were switched "hot" - indicates that this switch controls heat lamp "not" - indicates that this switch does NOT control heat lamp ~~word~~ - indicates that this possibility was eliminated Example: "2 hot → 1 not" means "2 was switched first, 1 was switched second, 1 controls the heat lamp, and 2 does not control the heat lamp."]	~~PBC~~
11	The heat lamp must be on. [Conclusion] **If it weren't, he would know that switch 3 controls it and has not yet been flipped.**	PBC P = were Q = PastMod 2
12	The lamp is on. [Conclusion] **If it were still off, then it would have to be switch #3**	PBC P = were Q = PastMod 2
13	[participant circled the word "on"] Because M. turned on switch 1 + switch 2. If switch 1 controlled the heat lamp, the temp would have changed (increased) after being on for 30 mins.	~~PBC~~
14	The heat lamp is on. [Conclusion] **If he saw that both 1 + 2 were on, but the lamp was off, he would have answered "Switch 3,"** since it would be the only switch left.	PBC P = Past Q = PastMod
15	The heat lamp is on. [Conclusion] **If it was off, he would know that switch 3, the only switch which was currently off, controlled the light.**	PBC P = was Q = PastMod 2
16	On. [Conclusion] Sherlock knew switches 1 and 2 were on. **If the heat lamp were off, he would have known Switch 3, which was off, controlled the heat lamp.** Since he said he didn't know that, the heat lamp must have been on, which made Sherlock unsure whether it was Switch 1 or 2 controlling the heat lamp.	PBC P = were Q = PastMod

Sample Item 2 – Switches

17	<u>On</u> [Conclusion] → **otherwise he'd know it was #3,** so it must be #2	PBC P = otherwise Q = PastMod 2
18	Sherlock knew Switch 3 was off. By his not knowing whether 1 or 2 controlled it, then you could infer that switch 3 did not & therefor [sic] had to be 1 or 2. Light switch. Light switch one did not ↑temp. as it remained 18.0C as observed when Light Switch 2 was flipped on. Thus if 1 & 3 are not the switch that controls the heat, then it must be 2.	~~PBC~~
19	<u>The heat lamp is on.</u> [Conclusion] **If it had been off, he would have known that switch #3 controlled the lamp,** since he saw that you had already turned switch 1 + 2 on + the lamp was still off. But since the lamp was on when he went in the room, he couldn't tell whether switch 1 or switch 2 had turned it on, since he didn't see which switch you turned on first. [at bottom] Switch 1 does not turn heat on	PBC P = Past Q = PastMod 3
20	(See below) **IF SHERLOCK SEES NO LIGHT, THEN 3 IS THE ANSWER[.]** IF SHERLOCK SEES LIGHT, THEN 1 <u>OR</u> 2[.] HE DON'T KNOW[.] ERGO, #2 [at bottom] 1 2 <u>18 18</u> SHERLOCK IF LIGHTED, THEN 1 OR 2 IF OFF THEN 3 SINCE ~~OFF~~ <u>ON</u> [Conclusion], HE DOES NOT KNOW.	PBC P = Pres Q = Pres 0

Sample Item 3 – Robbers

Participant		Response	Coded
1	a	**<u>Sentence 2 would be true if Sent. 1 were true</u>** – we know only 1 sentence is true Same for sentences 3 + 4 } they cannot be true	PBC P = were Q = PastMod 2
	b	**<u>Sentences 3 + 4 would force her TO BE in England if they are true</u>**	~~PBC~~/DTA P = Pres Q = PastMod
2	a	Sentence one and two could both be true together, which we know only 1 is true.	~~PBC~~
	b	Only one sentence is true, **<u>if 3 and 4 were both true we would know Englund is in England</u>**, but this cannot be the case since only one sentence is true.	~~PBC~~/DTA P = were Q = PastMod
3	a	He can see that it's not logical [it = sentence 1] because [if you assume all statements are true,] the two suspects, Lux and Englund, both end up in the UK by process of elimination. This is against the rules / criteria. [Participant provides evidence that not all of the statements can be true simultaneously. However, they have neither proven the target statement (that sentence 1 is false) nor explicitly stated what they HAVE proven.]	~~PBC~~
	b	Through the process of elimination he sees that Lux and Englund are also not in the same countries so that contributes to the problem of two people being somewhere at once. Switching things around to allow Fin to be in England clears this up.	~~PBC~~
4	a	**<u>If Ms. Lux is in England, then she can't be in Finland which would make both 1 + 2 true,</u>** which can't be as only 1 sentence can be true. Therefore, sentence 1 must be false.	PBC P = Pres Q = PresMod 1
	b	**<u>If Ms. Englund were in England, then both sent. 3 + 4 would have to be true</u>** as [Ms. Englund] couldn't be in either Finland or Luxembourg.	PBC P = were Q = PastMod 2
5	a	**<u>If #1 was true then it would mean #2 was also true</u>** and both cannot be true.	PBC P = was Q = PastMod 2
	b	Both 3 and 4 cannot be false at the same time so one of them has to be true meaning Ms. Englund is either in Finland or Luxembourg.	~~PBC~~ (but correct)

Sample Item 3 – Robbers

Participant		Response	Coded
6	a	~~#1 + #2 can both be true but they can't both be false. (Same for any pair of sentences.) If 2 + 3 are true Finn is in Finland. If 3 + 4 are true Englund is in England, so Lux must be in Luxembourg + 1 is false.~~	~~PBC~~
	b	~~Sorry I don't agree with Sherlock.~~	~~PBC~~
		[at bottom of page] [I] read the clue[s] backwards! 1 + 2 can both be false but can't both be true, So Lux cd. Be in Eng. ~~or Lux~~ 3 + 4 can both be false but can't both be true. <u>So Eng ≠ England</u>	
7	a	Only 1 sentence can be true, so **if she is in England, she is therefore NOT in Finland.** Both can't be true. The first sentence must be false as it would give the game away and would make 2) true.	PBC P = Pres Q = Pres 0
	b	**If these were true, then she would definitely be in England,** and <u>both</u> can't be true, only 1 is true.	~~PBC~~/DTA P = were Q = PastMod 2
8	a	**Because if #1 were true, Ms. Englund would be in 2 countries at once;** both 3 and 4 would be false.	PBC P = were Q = PastMod 2
	b	Because either 3 or 4 must be false – and the other true – if all three women are in separate countries and there are 3 False statements but only 1 true one	~~PBC~~ (but correct)
9	a	**If sentence 1 were the true one, then the three others would be false, meaning that Ms. Lux IS in Finland, and Ms. England IS in Finland AND in Luxemburg** – that can't be true.	PBC P = were Q = PastMod 2
	b	Sentence 3 or 4 must be the true one, because **if both were to be false, Ms. England would be in 2 places at once.** So, only one is true [Conclusion] and he is therefore <u>either</u> in Finland or Luxembourg.	PBC P = were to Q = PastMod 2
10	a	**If only sentence 1 is true – Ms. L is in England – the[n] that means Sentence 2 is false – so Ms L could be in Finland.** That's impossible. Thus, 1 can't be true (If sentence 2 is false, that means Ms. L could be in any of the three countries.)	PBC P = Pres Q = Pres 0
	b	[at top] - If [3] true, then she's in L (4 is false, which works) - If [4] true, then she's in Finland (3 is false, which works) Ms. E is either in Finland or Luxemborg [sic], regardless of whether 3 is true or 4 is true. Thus, Ms F is in England	~~PBC~~
		[at bottom] If 3 is F: could be in Finland, E, + L If 4 is F: could be in L, E, F	

Sample Item 3 – Robbers

11	a	**If (1) is true and Ms Lux is in England, then (2) would also necessarily be true.** But we know that only one sentence is true. Therefore, (1) cannot be true.	PBC P = Pres Q = PastMod
	b	**If Ms. Englund is in England, then both (3) and (4) would be true.** However, we know that only one out of the four can be true.	PBC P = Pres Q = PastMod
12	a	If #1 is true, then Ms. Englund can't be in Finland ~~of~~ or Lux, which leaves only England, where Ms Lux must be	~~PBC~~
	b	If she is in England, then either 3 or 4 must be true. But if 3 is true, she must be in Eng or Lux. But then Ms. Lux must be in Finland, & Englund must be in Lux as #4 is now false.	~~PBC~~
13	a	If both sent. 1 + 2 are <u>false</u>, then only 1 option is left for Ms. Lux → she <u>is</u> in Luxembourg.	~~PBC~~
	b	Because if 3 + 4 are <u>also</u> false, then no sentences are <u>true</u>.	~~PBC~~
14	a	**If sentence 1 were true, then that would mean that sentence 2 is false, i.e., that Ms. Lux IS in Finland.** He cannot be in 2 places at once, so #1 must be false.	PBC P = were Q = PastMod 2
	b	**If BOTH are false, it is another contradiction,** since she cannot be in 2 places at once. <u>Thus, one must be true,</u> [Conclusion] meaning she IS in Finland OR Luxembourg, and can't be in England.	PBC P = Pres Q = Pres 0
15	a	2 + 3 cannot both be false, since **that [that = 2 + 3 being false] would mean both Ms. Lux and Ms. Englund are in Finland,** when it is only possible that 1 of them is. Also, 3 + 4 cannot both be false, since **that [that = 3 + 4 being false] would mean Ms. Englund would be in both Finland and Luxembourg at the same time.** [Therefore, either 2 or 3 (but not both) must be true, and either 3 or 4 (but not both) must be true.] So that means that 1, 2, and 4 must be the three false statements. [Conclusion]	PBC P = NP Q = PastMod 2
	b	Since 1, 2, and 4 are false, that means Ms. Englund is in Luxembourg, not England.	~~PBC~~ (but correct)

Sample Item 3 – Robbers

Participant		Response	Coded
16	a	**If sentence 1 were true, the others would be false. However, this would mean that Ms. Lux is in England (Sentence 1, true) AND Ms. Lux is in Finland (Sentence 2, false),** which is logically impossible. Therefore, Sentence 1 must be false.	PBC P = were Q = PastMod 2
	b	**If Ms. Englund were in England, both sentences 3 and 4 would have to be true,** since they say she is not in Finland or Luxembourg. This cannot be, since only one sentence is true.	PBC P = were Q = PastMod 2
17	a	**If 1 is true then 2 would be true too** & only one sentence can be true.	PBC P = Pres Q = PastMod
	b	Again, **if she is in England #3 & #4 would be true** and that can't be the case.	PBC P = Pres Q = PastMod
18	a	Both 2 & 3 indicate neither are in Finland, you would think one of them would likely be true & therefore sentence 1 would be one of the false statements.	~~PBC~~
	b	[Participant left item blank.]	~~PBC~~
19	a	1 + 2 seem mutually exclusive. **If Ms Lux is in England (1 = True), then 2 has to be false,** which doesn't make sense. Similarly, if 2 = T, then 1 has to be false, which also doesn't make sense. So Ms. Lux can't be the one in England.	PBC P = Pres Q = Pres 0
	b	If 3 is T, then 4 has to be false, so again this doesn't make sense [i.e. Englund not in England]. If 4 is T, then 3 has to be false, so that doesn't make sense either [i.e. Englund still not in England]. (In each case, one has [to be] True for her to be in England + also False for her to be in England). [The participant's seems to be reasoning that at least one of statements 3 and 4 must be false, and in either case, Ms. Englund is not in England. This does not involve PBC.]	~~PBC~~
20	a	IF #2 **(which follows from #1 [if 1 is true.])** IS TRUE, THEN #1 CANNOT BE TRUE ALSO [since, at most, only one of these 2 statements is true.]	PBC P = covert Q = Pres 0
	b	EITHER 3 or 4 ~~OR BOTH~~ ARE FALSE IF 3 IS TRUE SHE IS IN ~~LUX OR~~ LUX IF 4 IS TRUE SHE IS IN FINLAND	~~PBC~~ (but correct)

Sample Item 4 – Game Show

Participant	Response	Coded
1	[above question] ? (he was able to see the host draw the no.) [beneath question] The letters 2 + 3 contain rounded strokes unlike 1 + 4 which are composed of straight line segments – 2 + 3 are also the only doors w/ doors on either side	~~PBC~~
2	**If the number were 1 or 4 (on the paper) there would only be one choice,** since there is confusion, there must be two choices. Only 2 or 3 have a number on either side.	PBC P = were Q = PastMod 2
3	Because the 1 and 4 don't have doors on both sides of them that can be odd or even like 2 + 3 do.	~~PBC~~
4	**If it was door #1 or 4, then there would only be 1 door next to it, which it would have to be.**	PBC P = was Q = PastMod 2
5	Because **if it was 1 or 4 there would only be one door next to it meaning the hint would give away the answer.**	PBC P = was Q = PastMod 2
6	**If it said 1 or 4, Larry wd. know for sure which door had the $.**	PBC P = Past Q = PastMod 2
7	Because 1 + 4 only have one door next to them **which [which = door 1 or door 4 having one door next to them] would give the answer** eg. Next to door 1 must be 2.	PBC P = NP Q = PastMod 2
8	Because 2 + 3 each have two doors next to them; 1 + 4 only have one door next to them. **If the number on Larry's paper was 1 or 4 he'd know the answer.**	PBC P = Past Q = PastMod 2
9	Because doors 1 and 4 only have one other door <u>next to</u> it, so if Larry isn't certain[,] the correct door must be surrounded by two others, and only 2 and 3 fit that description.	~~PBC~~
10	Because 1 is only next to 1 door, so **[if 1 was written on the paper,] Larry would know the answer.** And because 4 is next to only one door, **[if 4 was written on the paper,] Larry would know the answer.** Thus, it has to be #2 or #3.	PBC P = covert Q = PastMod 2

Sample Item 4 – Game Show

Participant	Response	Coded
11	If the friend isn't sure, then the correct door is <u>next to</u> two doors. Only doors 2 and 3 are next to two other doors.	~~PBC~~
12	Because they only have 1 door next to them each – so – **obvious guess if #1 or 4 on paper** [bottom of page] But I give Larry nothing as he was no help!	PBC P = no verb Q = no verb
13	Because **there is only 1 choice if [the paper] has a "1" or "4"** i.e., if it says "1," it must be "2." if it says "4," it must be "3."	PBC P = Pres Q = Pres 0
14	**If his paper said 1 or 4, then he would know the right answer is 2 or 3, respectively,** since they are the only doors next to those numbers, while 2 or 3 have 2 doors next to them.	PBC P = Past Q = PastMod 2
15	Each of those doors has only one door next to it, so **telling Larry the money was in the door beside either of them [doors 1 and 2] would let him know for certain which door it was behind.**	PBC P = NP Q = PastMod 2
16	Doors 1 and 4 each have only one door next to them, namely 2 and 3, respectively. **Had the piece of paper had 1 or 4 written on it, Larry would have known the answer because there would be only one possibility.**	PBC P = Past Q = PastMod 3
17	Because **1 [being on the piece of paper] & 4 [being on the piece of paper] leave only one option for the correct door (2 or 3 respectively).**	PBC P = NP Q = Pres 0
18	Because door #1 does not have a door on the left and door #4 does not have a door on the right. So, the correct door must [be] #2 or 3.	~~PBC~~
19	**If it had 1 on the paper, he would have said door #2,** since that is the only door next to #1. **If it had 4 on the paper, he would have said door #3,** since that is the only door next to #4.	PBC P = Past Q = PastMod
20	**IF PAPER HAD A 1 OR 4 ~~OR BOTH~~ ON IT THE ANSWER IS 2 OR 3** SINCE [HE IS] NOT SURE [WHAT THE ANSWER IS,] THERE MUST BE ~~1 OR 4~~ 2 OR 3 [on the paper.]	PBC P = Past[18] Q = Pres

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[18] Although participant 20's p-clause contains a remote form ("had"), the q-clause contains an immediate form ("is"). One explanation for this seeming discrepancy is that the remote form "had," rather than indicating that participant 20 views the p-proposition as counterfactual, merely indicates past time reference.

Appendix G: Questionnaire Data - Relating it to the Real World

Participant	Response	Coded
1	An insured calls with a claim file concerning water/flooding. My challenge is to help the individual explore all possibilities for the cause of loss. If the water heater is located in an adjacent space, is it possible the WH failed causing the flooding – as opposed to water running off from the nearby hillside) seeping into the bldg causing the flooding Problem: I know that water-runoff is not a covered loss – therefore, I am looking for all possible sources of this cause of loss and not just the most obvious. [When seeking alternative explanations for a phenomenon, proof-by-contradiction could be used to discount a possible explanation, but it is not the only way.]	Insufficient evidence of transfer
2	[blank]	Blank
3	I understand the logic now by seeing the process that wasn't clear earlier. I try to work through examples of this with grammar explanations in French to my students like showing them why certain verbs aren't conjugated with a certain auxiliary in the past tense. I also try to use this when I think through examples in my reading to see why facts are a certain way.	Insufficient evidence of transfer
4	[blank]	blank
5	In writing structure (rhetoric) we teach that providing the opposing viewpoint and then discrediting it is an effective way of proving your point. [proof-by-contradiction is not the only way to discredit a claim.]	Insufficient evidence of transfer
6	This would be a rare strategy, but I probably use it. Example: thinking of the cause of a household problem – a roof leak must be coming from one place b/c it can't be coming from several other places. Eliminating some possibilities to narrow down to 1. [This is a suitable context, but no example sentence is given.]	Insufficient evidence of transfer
7	- When discussing students ability + adapting curriculum. E.g., "If they could…" "If we didn't give them… they couldn't" (speaking) - Booking holidays [with friend, partner, spouse] [Participant provided examples orally: "If that hotel had a pool, we could go there." "If they offered a discount, that would be a good place to go." [The adapting curriculum example refers to future action/inaction and is not PBC. The booking holidays example is counterfactual, but it being used to specify the reason for a refusal, not for PBC.]	Evidence that participant does not fully understand PBC
8	1) Jim is not teaching. 2) If Jim were teaching, 3) he would not be in his office right now and he is. 1) The heat isn't on in the oven where we put the pizzas (still in their boxes). 2) If the heat were on, 3) we'd smell the pizza boxes burning.	Evidence of transfer

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Participant	Response	Coded
9	I could see this put to use in future-planning conversations and imaginary conversations: - If the bus was late, I'd need a ride to campus - If you were ever sick, I could bring you soup. - <u>If I had done my homework, I would know the answers, wouldn't I?</u> [The 3rd example is a PBC. However, the 2nd sentence (and possibly 1st) refers to the future and is not counterfactual.]	Evidence of transfer & Evidence that participant does not fully understand PBC
10	Yes – the situation that most clearly comes to mind is when giving advice to friends who jump to conclusions. Ex: One friend read a professor's comment on her paper ("a fine seminar paper") to mean that the prof. was advising her not to publish it, w/ the thought that <u>the prof would have said so explicitly had she thought it was of publishable quality.</u> I tried to tell my friend that just because the professor didn't write that explicitly doesn't mean she doesn't feel that way; the prof might not say those things to anyone; she might enourage you to seek publication if you go talk to her… there are so many reasons why she might have written (or didn't write) what she did.	Evidence of transfer
11	Boy A says that he loves girl B. Girl says that's not true, because <u>if he loved her he would call her every day.</u> Since Boy does not call, he doesn't love her.	Evidence of transfer
12	Strangely enough, I use this when doing 3D design on the computer. "<u>If this piece is actually right (when I think it's actually wrong) that that would mean all the other others are off.</u>"	Evidence of transfer
13	I don't think so… That's why these are challenging for me! Good luck with your study!!	blank
14	I mostly use this for political/theological debates. Such as, "<u>If you aren't in favor of universal healthcare, then you favor the opposite, that not everyone gets treatment.</u> In other words, you think it's acceptable to let others suffer and die rather than help everyone." [Presumably, the hearer would reject the Q-clause as counterfactual.]	Evidence of transfer
15	In writing research papers and demonstrating that a hypothesis has been correct or incorrect, I use this type of reasoning, for instance: "<u>If the hypothesis was correct, we would have seen result X,</u> and since we did not, the hypothesis must be incorrect." In more everyday life, I might use this to talk with someone about a person or thing we are looking for. For instance: "<u>If she was in her office she would have picked up her phone,</u>" or "<u>If you had left your wallet at Jane's house, she would have texted you to let you know</u>"	Evidence of transfer

Participant	Response	Coded
16	I use that device often. I am a law student. Often I try to counter an argument that X is true by showing that if X were true, … Thus, I can prove that X is false. Also, I tend to be very analytical and logical, and when I am confronted with dubious claims regarding alternative medicine, etc., I may argue that "X is true" leads to some logical contradiction or absurdity to show that X is false. Example: There is a reflexology chain in Japan that claims its treatment of foot massages and water can cure cancer. I argued that it cannot by saying <u>if it were true, either the chain owners would be billionaires, or there would be no cancer in Japan.</u>	Evidence of transfer
17	Yes, very often in marketing when deciding which campaigns are working and which are not. i.e. <u>if the emails were not teaching students, they wouldn't know of their club discount and events.</u> <u>If students were motivated by a free giveaway, we would have more information cards.</u>	Evidence of transfer
18	I typically don't use this strategy	blank
19	Did my daughter really wash her hands? If the sink + towel are not wet, she didn't! [It is not clear whether the participant is providing evidence that his daughter did not wash her hands or is recommending that the other speaker go check.]	Insufficient evidence of transfer
20	IN SUDOKU PUZZLES THIS IS TECHNIQUE I USE. IF THE GUY WHO HIT MY CAR DROVE AWAY HE MUST NOT HAVE AUTO INSURANCE. [This is a suitable context, but no example is provided. For example, a proof-by-contradiction in this context might be "If he had auto insurance, he would not have driven away."]	Insufficient evidence of transfer

Test Specifications

Counterfactual Second Conditionals

Shawn Fitzpatrick

The following document outlines the specifications for test items whose purpose is to formally assess the effectiveness of grammar instruction which has the objective of developing learners' ability to deploy counterfactual second conditionals (and related forms) to perform certain illocutionary acts. The items will form the testing instrument in a study with pre-, post-, and delayed test design.

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General Description
Test items will be *tasks*[19] for which the production of counterfactual second conditionals is natural to the task. More specifically, tasks will be designed which (when administered to NS's) will tend to *elicit* (elaborated in below in "General Specifications") the performance of an illocutionary act for which the corresponding range of language forms:
1) …is relatively limited.
2) …includes counterfactual second conditionals.

Objective of Test Items
The purpose of test items is to formally assess the effectiveness of grammar instruction which has the objective of developing learners' ability to deploy counterfactual second conditionals (and related forms) to perform certain illocutionary acts. The items will form the testing instrument in a study with pre-, post-, and delayed test design.

The tests will be used to draw inferences about whether instruction has a positive effect on learners' ability to:
1) …perform the targeted illocutionary act in the expected environment (if the targeted illocutionary act is culture-specific), and…
2) …do so using a form within the range of forms used by NS's to complete the same task.

Since counterfactual 2nd conditionals are used to perform a variety of illocutionary acts, it is acceptable if the entire test elicits a range of illocutionary acts, as this will provide multiple sources of evidence as to the effectiveness of instruction. However, each test item will be designed so as to elicit only one illocutionary act.

Pedagogical Rationale
One reason for including counterfactual conditionals in the curriculum of an ESL/EFL course is that many language learners (e.g., East Asian learners) come from L1 backgrounds for which counterfactuality has no bearing on grammatical structure.
Also, there is a pedagogical rationale for designing tasks which specifically target counterfactual *second* conditionals (rather than other past-tense-only conditionals). First, second conditionals are linguistically simpler than other past-tense only conditionals. Also, second conditionals make more salient the fact that past tense does not necessarily indicate past time reference.

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[19] For the purpose of this document, *task* refers to any activity whose primary objective (from the perspective of the participants) can be stated in non-linguistic terms.

General Specifications
The prompt specifications will vary depending on the illocutionary act. However, *all* tasks will share the following criteria:

- **Does not explicitly focus participant's attention on form**
  Prompts will not place any explicit grammatical restrictions on the participant (e.g., by providing instructions such as "Use the 2nd conditional.").

- **Does not contain a *trigger***
  Prompts will not provide a *trigger*; i.e. the wording of prompts will not include a counterfactual 2nd conditional (e.g., "You would help this person, but…").

- **Similar to real-world tasks**
  From the perspective of participants, tasks will be perceptively similar to real-world tasks. This criterion is specified in order that transfer of learning to real-world tasks can reasonably be inferred.

- **Elicitation**
  Tasks should elicit the target structure from a "significant majority," which is loosely defined as lying somewhere between 50% and 100%.
  .

Distribution of Test Items
Since different illocutionary acts may involve different skills, care should be taken to insure that, for every illocutionary act to be assessed, the pre-, post-, and delayed test each contain the same number of test items.

Defining Illocutionary Acts
As mentioned above, task type is influenced by the illocutionary act to be assessed. Therefore, a necessary first step in writing sub-specifications has been to define which illocutionary acts can be performed by counterfactual 2nd conditionals. Since there does not appear (as of this writing) to be any satisfactory published list of such illocutionary acts, the following procedure was used:

1) Gather a corpus of naturally-occurring counterfactual 2nd conditionals.[20]
2) Posit the illocutionary act being performed in each example.
3) Group together examples that seem to be performing the same illocutionary act.
4) Select the most frequently occurring illocutionary acts, as these will be of the greatest use to students.

The product of this procedure is a list of posited illocutionary acts which appears in the following section. (Note: These are *posited* illocutionary acts. Therefore, the list should be considered neither exhaustive nor definitive. The validity of each illocutionary act will

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[20] The corpus included examples collected from a variety of sources: articles and books on linguistics as well as examples collected from search engines such as Google.

depend largely on whether a task can be designed which elicits it. For this reason, this list may be edited/appended in future iterations.)

Posited Illocutionary Acts
Below is a list of posited illocutionary acts. After each entry are the following: a) the environment in which this illocutionary act is expected to occur (if this is informative), b) the illocutionary act's status (i.e. the status of the theory that the illocutionary act tends to be achieved using counterfactual 2nd conditionals, as supported by the data elicited by the task type), and c) an example of that illocutionary act.

1) To indicate that one is willing but unable to grant a request
(Note: This is generally followed by the specific reason for the refusal)

Status: Consistent with data gathered in 1st pilot study

E.g.,   I'd help you out if I could, but + (reason for refusal)

2) To demonstrate that something is true/false by using proof-by-contradiction

Status: Consistent with data gathered in 1st pilot study

*E.g.,   If John were home, his car would be parked outside.
(provided as evidence that John is not home.)*

3) To give or solicit advice

Status: Pending development of task specifications

*E.g.,   I wouldn't do that if I were you.
What would you do if you were in my shoes?
(Note: Such counterfactual constructions are also counter-identical)*

Overview
The numbering of the section headings for task types, i.e. the organization of the remainder of this document, corresponds to the numbering of posited illocutionary acts described in the previous section.

Sub-specifications for Task Type 1

Posited Illocutionary act
To indicate that one is willing but unable to grant a request

Status of Posited Illocutionary act
Consistent with data gathered in 1st pilot study

Overview
Tasks are oral role-plays involving 2 participants. One participant makes a request and the other participant refuses that request.

Range of Forms
Counterfactual 2nd conditionals
- *I would…, but…*
- *I'd love…, but…*
- *I'd like…, but…*

Other forms
- *I wish…, but…*

Examples of Target Language
If I didn't already have plans, I would give you a ride.
If I knew how to help, I would.
I would lend you the money if I had it.
I wish I could help.

Specifications[21]
- **R2 is Unable to Grant Request**
  - The situation is such that R2 is unable to grant the request, and the reason that R2 is unable to grant the request can be stated in the present tense (e.g., "I am busy.", "Her car doesn't have enough room.", "He lives too far away.")
  - R2 will be explicitly instructed to refuse the request. The purpose of this criterion is to help elicit the target language.
- **R2 is Unable to Offer Alternative Solutions**
  - R2 cannot easily solve R1's problem any other way (aside from having R1 ask someone else). In addition, the request is time-sensitive; i.e. R2 cannot grant the request at a later time. These criteria are to increase the likelihood that R2 is unable to offer an alternative solution (e.g., granting the request at a later time).

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[21] P1 = participant #1 (the requester), P2 = participant #2 (the refuser),
R1 = role played by participant #1, R2 = role played by participant #2

- **R2 Has a Desire to Help**
  - R2 has a desire to help R1, and R2 will be explicitly instructed that he/she has a desire to help R1. The purpose of this criterion is to help elicit the target language.
- **R1 Doesn't Know that R2 Feels a Social Obligation**
  - Relative to the magnitude of the request, R1 and R2 are not close enough that a social obligation will be assumed. In other words, the situation and the relationship between R1 & R2 will be such that it will not be obvious to R1 that R2 has a sincere desire to help (e.g., the prompt may specify that R1 & R2 have known each other only for a relatively short time). The purpose of this criterion is to increase the likelihood that R2 will feel a communicative need to express a desire to grant the request.
  - Participants will be screened to insure that P1 & P2 do not have an intimate relationship in real life (e.g., family members, close friends). This criterion is to avoid the effect that participants' real-world relationship may have on the role play.
- **R2 is not in a dominant role**
  - R2 does not have a dominant role relative to R1 (e.g.,,R1 should not be R2's employee asking for a day off of work). However, the reverse may be true; i.e. R1 may have a dominant role relative to R2. This criterion is based on the fact that a boss's desire to cater to their employee's wishes may be at odds with their need to maintain a dominant role.
  - Participants will be screened to insure that neither P1 nor P2 has a real-life dominant role relative to the other. This criterion is to avoid the effect that participants' real-world relationship may have on the role play.

Procedure for Task Type 1

1) Prior to the session, randomly order the role plays
2) Seat participants in a quiet room.
3) If there is a table, have participants sit perpendicular to each other. (Rationale: Having participants sit opposite one another could render the roles adversarial, and having them sit on the same side of table could render roles overly intimate.)
4) Tell participants, "I want you to feel comfortable during the role-plays, so please introduce yourself to each other."
5) Allow up to 5 minutes for participants to introduce themselves.
6) If they finish before 5 minutes have elapsed, say, "Okay, if you guys are ready, then we will proceed."
7) Randomly assign participants the letter A or B by having them blindly draw cards.
8) Tell them, "Leave your card turned face-up."
9) Test the recording device by turning it on, having each participant speak, and playing it back.
10) Read the following instructions to the participants:

You will participate in (specify the number of role-plays) role-plays. For each role-play, I will give you a card. Your card has: your role, the other role, the situation, and your instructions (in other words, what you are supposed to do). Then, I will stand just outside the door. Please do not show your card to the other person, and please do not ask the other person what is on their card. If you do not understand something, you may ask me.

After you have read and understood your card, you may take some time to imagine the situation and get into your role. When you are ready to begin, please let me know. Then, I will enter the room, start the recorder, and leave the room again. When you are finished, call me, and I will enter the room.

Are there any questions so far? (Answer any questions they have)

Okay, so you will participate in (number of role-plays) role-plays. In other words, you will be acting. To act, it is important that you get into your role and imagine the situation. For some people this is difficult. For some it is very easy. Here are some tips to help you:

- *Think about your role's motivations. And if there is not enough information on the card to understand your motivations, then imagine the missing information. If you understand WHY you are doing something, it will feel more natural, and it will be easier to BE this person*
- *After you understand your role's motivations, as much as possible, try to think of a similar experience from your life. Then, try to REMEMBER this experience. To do this, you might find it helpful to close your eyes. To help you remember, ask yourself questions like, "Where were you?";*

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"What were you doing at this time?"; "How did you feel?"; "What were you looking at?"; "What sounds did you hear?"

- *And as I said before, after you read your card, take as little or as much time as you like to imagine the situation and get into your role.*

We will begin with a practice role-play.

12) For the practice role-play (and each subsequent role-play), follow the instructions as outlined in the first 2 paragraphs of the above instructions.
13) Before and after the role-plays, participants may be tempted to find out what is on each others' cards. If this happens, politely remind them of the instructions:

Please do not show your card to the other person, and please do not ask the other person what is on their card. If you do not understand something, you may ask me.

Dealing with Questions
- If a participant has a question about the procedure itself, answer the question directly.
- If a participant wants the proctor to clarify something which is unambiguously specified on the card (e.g., because they don't know a vocabulary word), answer the question directly.
- If a participant wants the proctor to clarify something which is not specified on the card or which is ambiguously specified (e.g., "How well do I know the person?"; "Can I ask the other person to reschedule?"), repeat the following instructions:

Like I said in the instructions, think about your role's motivations. And if there is not enough information on the card to understand your motivations, then imagine the missing information.

History of Sub-specifications for Task Type 1

Prototype Task

The inspiration for the refusal role-plays was a task which was used in Liao & Bresnahan's (1996) study. It analyzed four types of refusals and demonstrated that refusals of requests were often prefaced by "would" phrases. In their study, American participants were provided with six written prompts (more precisely, six discourse completion tasks) and were asked to choose and provide a written response to one of those prompts. Each prompt described a hypothetical scenario in which a refusal would be natural.

One prompt was a scenario in which the participant is asked for help moving:

"Your longtime friend asks for your help in moving. You have an important exam coming up. What would you say?"   (p. 707)

More than half of the NS's of American English who refused (53.85%) prefaced their refusals of requests with statement of good intention involving "I would…"

Revisions Made after the First Round of Pilot Testing
- **Range of Forms**
"I wish…" phrases were added to the list of desirable target forms.

Rationale: "I wish…" phrases were added for two reasons. First, the results of the first round of NS pilot testing seemed to indicate that the communicative function performed by second conditional expressions of willingness and "I wish…" expressions of willingness are more or less identical. Therefore, it seems well-motivated to redefine the target language for the refusal role-play tasks so as to include both forms. Second, in light of the fact that both types of expression share the fact that they use past tense to emphasize counterfactuality, a pedagogical treatment of second conditionals to perform refusals could be nicely complemented by a treatment of "I wish…" phrases.

- **P1 Doesn't Know that P2 Feels a Social Obligation**
Under the specification "P1 Doesn't Know that P2 Feels a Social Obligation," the phrase "close friends" was added:

"Participants should be screened to insure that P1 & P2 do not have an intimate relationship in real life (e.g., family members, **close friends**). This criterion is to avoid the effect that participants' real-world relationship may have on the role play."

Rationale: In the first round of NS pilot testing, participants 19 and 20 were friends that had known each other for almost 30 years. Although participant 19 produced an explicit expression of willingness in the "Can I borrow your truck?" role-play, participant 20 failed to produce expressions of willingness in either the

"Can you lend me $300?" or the "Can you substitute for another teacher?" role-plays.

Although participant 20's failure to produce an expression of willingness may have just been an idiosyncrasy, it is plausible that she was transferring her real-world relationship with participant 19 into the role-plays and hence felt that her desire to help the other person would be self-evident.

Note: It is not entirely clear how this specification should be realized, since it may be difficult to determine whether participants are "friends" or "close friends."

- **P1 & P2 vs. R1 & R2**
  A distinction was made between participants (P1 & P2) and the roles played by those participants (R1 & R2).

  Rationale: Participants' real-world relationship could potentially transfer to how they orient to the role-play. Therefore, any limitations placed on roles should also be placed on the selection of participants. In order to better articulate this point, it was necessary to make the distinction between participants and their roles.

  In the first round of NS pilot testing of the role-plays, this idea was applied to the participant screening. However, it was not made explicit until after NS pilot testing.

- **R2 is not in a dominant role**
  The specification "R2 is not in a dominant role" was added.

  Rationale: In the first round of pilot testing of the "Can I take the day off next Friday?" role-play, only 2 of 10 participants prefaced the reasons for their initial refusals with explicit expressions of willingness. In other words, the role-play failed to elicit the target language.

  The simplest explanation for this failure is that in the "Can I take the day off next Friday?" role-play, in contrast to the other role-plays that were tested, the refuser has a dominant role. This is probably relevant, since a boss's desire to cater to their employee's wishes may be at odds with their need to maintain a dominant role.

- **Instructions**
  After the first round of pilot testing, the following instructions were added:

  "12) Before and after the role-plays, participants may be tempted to find out what is on each others' cards. If this happens, politely remind them of the instructions:

Please do not show your card to the other person, and please do not ask the other person what is on their card. If you do not understand something, you may ask me."

Rationale: If the requester knows in advance how the other person is going to react (e.g., that the other person is going to refuse; why the other person is going to refuse), it may influence how they orient to the task.

This criterion was added, because in the first round of pilot testing of the refusal role-plays, although most participants did not attempt to look at the other person's card before starting each role-play, some asked if they were allowed to. Moreover, most participants looked at the other person's card after the role-play was completed.

Also, the section "Dealing with Questions" was added.

Rationale: In the first round of pilot testing of the refusal role-plays, several participants asked questions about what they were supposed to do. In most cases, the researcher answered these questions directly. However, in some instances, the researcher felt that answering the question directly would have been too directive. The guidelines for how to deal with questions were provided to insure consistency in any future replication studies.

Test Item Bank for Task Type 1 – Practice Item[22] (Iteration 1.1)

Can you make it to the party?

A: The requester

Your role:	You are a college student.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	It is the end of the semester soon. You are organizing a small party for your classmates on Saturday.
Instructions:	You will begin the role-play. Pretend to call your classmate on the phone and invite him/her to the party.

B: The refuser

Your role:	You are a college student.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	It is the end of the semester soon. Your friend will invite you to party on Saturday. However, you are leaving on Thursday, so you will not be able to attend.
Instructions:	Wait for classmate to begin the role-play. He/she will call you on the phone. You really want to attend the party, but you will refuse the request.

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[22] The sole purpose of the practice item is to accustom participants to the test format. Therefore, only its surface features have been designed to fit to test specifications.

Test Item Bank for Task Type 1 - Item 1

Title
Can you lend me $300?

Status
Operational

Description
In this role-play participants play the roles of acquaintances. One person requests to borrow $300, because they cannot afford to pay their rent. The other participant refuses, because they do not have enough money to lend.

History of Iterations

1.1	Pilot 1

Item Bank for Task Type 1 - Item 1 (Iteration 1.1)

Can you lend me $300?

A: The requester

Your role:	You are a college student. To pay for school, you have student loans, and you work a part-time job.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	Recently, you had a car accident. Luckily, you were not injured, but your car was totally ruined. Because you live far from campus, you need a car to get to school. Unfortunately, your insurance company did not give you any money to buy a new car, so you bought one with your own money. Because of this, you now do not have enough money to pay this month's bills (rent, electricity, gas, etc.). The rent is due in 3 days. You need about $300 more. You don't want to ask your parents for money.
Instructions:	You will begin the role-play. Pretend to call your classmate on the phone and ask him/her to lend you the $300 that you need.

B: The refuser

Your role:	You are a college student. To pay for school, you have student loans, and you work a part-time job.
The other role:	The other person is one of your classmates. You have known him/her for 1 year.
Situation:	Your classmate (the other person in this role-play) will ask you to borrow some money. This person really needs the money, and you feel very sorry for him/her. However, you have almost no money in your bank account, and your next paycheck is 2 weeks away.
Instructions:	Wait for classmate to begin the role-play. He/she will call you on the phone. You really want to help him/her, but you will refuse the request.

Test Item Bank for Task Type 1 - **Item 1 (Pilot 1)**

Results of Pilot 1

The "Can you lend me $300?" role-play elicited a refusal from 10 out of 10 participants.

In 8 out of 10 dialogues there was at least one refusal of the form:
     EWG + RTR [Expression of willingness + reason to refuse]

In all of these 8 dialogues at least one of the following sequences occurred:
     2nd conditional EWG
     "I wish…" EWG + RTR

In 5 of these 8 dialogues there was at least one refusal of the form:
     2nd conditional EWG + RTR

Item was given operational status.

Test Item Bank for Task Type 1 - **Item 2**

Title
Can I borrow your truck?

Status
Pending additional NS pilot testing

Description
In this role-play participants play the roles of two acquaintances. One person requests to borrow the other person's truck to move to a new apartment. The other participant refuses, because they are camping.

History of Iterations

1.1	Pilot 1	2.1

Item Bank for Task Type 1 - Item 2 (Iteration 1.1)

Can you help me move?

The requester:

Your role:	You are a college student. You own a truck.
Partner's role:	Your partner is one of your classmates. You have known him/her for 1 year.
Situation:	Today is Thursday, July 30th, and you're at home. Tomorrow, Friday, July 31st, you're moving out of your apartment. Your new contract starts Sunday, August 2nd. You were planning on using your truck to move, but unfortunately, it stopped working this morning. Now, it's at the mechanic's. You told your landlord about this, but he said that you have to get out of the apartment by the 31st, because someone is moving in on August 1st. Also, your new landlord will not let you move your things into the new place before August 2nd, because it's being painted. You can rent a moving truck for 3 days (Jul. 31st – Aug. 2nd), but this will cost over \$100. Fortunately, one of your classmates (your partner in this role-play) has a truck.
Instructions:	You will begin the role-play. Pretend to call your classmate on the phone and ask him/her to help you move.

The refuser:

Your role:	You are a college student. You own a truck.
Partner's role:	You partner is one of your classmates. You have known him/her for 1 year.
Situation:	Today is Thursday, July 30th, and the semester will be starting again soon. To relax before classes start, you and 3 close friends went camping. You arrived at the campsite this morning, and you are planning on driving back Sunday evening. Your classmate (your partner in this role-play) will call you and ask for help moving. You want to help, but you are 2 hours away from town.
Instructions:	Wait for your classmate to begin the role-play. He/she will call you on your phone. You really want to help him/her, but you will refuse the request.

Item Bank for Task Type 1 - Item 2 (Iteration 1.1) (Continued)

Can you help me move?

July

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

July

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Test Item Bank for Task Type 1 - **Item 2 (Pilot 1)**

Results of Pilot 1
The "Can I borrow your truck?" role-play elicited a refusal from 9 out of 10 participants. The participant who did not refuse the initial request did provide the reason that she could not grant the request, but she did not realize initially that there was a time conflict.

In 4 out of 10 dialogues there was at least one refusal of the form:
  EWG + RTR [Expression of willingness + reason to refuse]

In 4 of these 4 dialogues there was at least one refusal of the form:
  2nd conditional EWG + RTR

In this role-play 4 of the 5 participants who refused to lend their truck but did not preface their refusal with an expression of willingness also suggested that the requester borrow a truck from someone else. Also, 2 participants who did not preface their refusal with an expression of willingness agreed or provisionally agreed to temporarily swap the truck for a third party's car.

In both of these cases, participants' failure to issue an expression of willingness to grant the request seems to be correlated with the fact that they perceived the requester to have at least one other option.

Although this test item was not given operational status, the researcher felt that it may be possible to revise item so as to increase the likelihood of elicitation (See Iteration 2.1).

Item Bank for Task Type 1 - Item 2 (Iteration 2.1)

Can I borrow your truck?

B: The requester

Your role:	You are a college student. You own a truck.
The other role:	The other person is one of your classmates. You have known him/her for 1 year. This is the only other person that you know who owns a truck.
Situation:	Today is Thursday, July 30th, and you're at home. Tomorrow, Friday, July 31st, you're moving out of your apartment. Your new contract starts Sunday, August 2nd. You were planning on using your truck to move, but unfortunately, it stopped working this morning. Now, it's at the mechanic's. You told your landlord about this, but he said that you have to get out of the apartment by the 31st, because someone is moving in on August 1st. Also, your new landlord will not let you move your things into the new place before August 2nd, because it's being painted. You can rent a moving truck for 3 days (Jul. 31st – Aug. 2nd), but this will cost over $100. Fortunately, one of your classmates (the other person in this role-play) has a truck.
Instructions:	You will begin the role-play. Pretend to call your classmate on the phone and ask him/her to help you move.

A: The refuser

Your role:	You are a college student. You own a truck.
The other role:	The other person is one of your classmates. You have known him/her for 1 year. This is the only other person that you know who owns a truck.
Situation:	Today is Thursday, July 30th, and the semester will be starting again soon. To relax before classes start, you and 3 close friends are at a campsite. You have brought camping equipment, a grill, and several kayaks. You transported this equipment in your truck, because none of your friends had a car or a truck with enough space. You arrived at the campsite this morning, and you are planning on driving back Sunday evening, August 2nd. Your classmate (the other person in this role-play) will call you and ask for help moving. You want to help, but you are 2 hours away from town.
Instructions:	Wait for your classmate to begin the role-play. He/she will call you on your phone. You really want to help him/her, but you will refuse the request.

Item Bank for Task Type 1 - Item 2 (Iteration 2.1) (Continued)

Can I borrow your truck?

July

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Test Item Bank for Task Type 1 - Item 2 (Iteration 2.1)

Differences between Iteration 1.1 and 2.1

1. *Unable to offer alternative solutions.* The prompt for the "Can I borrow your truck?" puzzle was appended to indicate…

       1) …that neither participant knew anyone else with a truck

         …and…

       2) …that the truck was being used to transport large camping equipment

Rationale: The results from pilot 1 of iteration 1.1 of the "Can I borrow your truck?" puzzle suggest that some of the participants who did not issue expressions of willingness may have failed to do so, because they perceived the requester to have other options.

Test Item Bank for Task Type 1 - **Item 3**

Title
Can you substitute for another teacher?

Status
Operational

Description
In this role-play participants play the roles of a principal and a teacher. The principal requests that the teacher substitute for another teacher, because the usual teacher is sick. The teacher refuses, because they have promised to pick a friend up at the airport.

History of Iterations

1.1	Pilot 1

Item Bank for Task Type 1 - Item 3 (Iteration 1.1)

Can you substitute for another teacher?

A: The requester

Your role:	You are the principal of a private school.
The other role:	The other person is a teacher who started working at your school 3 months ago.
Situation:	It is Friday afternoon, and you are at school. Julie, one of your teachers, teaches a Saturday class. However, Julie cannot teach her class, because she has the flu. There are 3 other teachers that are qualified to teach this class. Unfortunately, 2 of them cannot teach on Saturday: one of them is out of town, and the other one has the flu (just like Julie). However, there is one other teacher that you can ask (the other person in this role-play). He/she has less experience than the other 2 teachers, but he/she is qualified to teach the class.
Instructions:	You will begin the role-play. Pretend to go to the teacher's (the other person in this role-play) classroom and ask him/her to substitute teach for Julie.

B: The refuser

Your role:	You are a teacher at a private school. You started teaching at this school about 3 months ago. Your teaching schedule is Monday-Friday.
The other role:	The other person is the principal of the school.
Situation:	It is Friday afternoon, and you are in your classroom. You have finished teaching for the day, and you are about to go home. Julie, one of the other teachers, teaches a class on Saturdays. The principal (the other person in this role-play) will enter the room and ask you to substitute teach Julie's class tomorrow. However, you have already promised to pick up your friend at the airport on Saturday (tomorrow). The airport is 2 hours from your house, so you will be gone most of the day.
Instructions:	Wait for the principal to begin the role-play. He/she will come to your classroom. You want to help, but you will refuse the principal's request.

Test Item Bank for Task Type 1 - **Item 3 (Pilot 1)**

Results of Pilot 1
The "Can you substitute for another teacher?" role-play elicited a refusal from 10 out of 10 participants.

In 7 out of 10 dialogues there was at least one refusal of the form:
>   EWG + RTR [Expression of willingness + reason to refuse]

In all of these 7 dialogues at least one of the following sequences occurred:
>   past-tense-only conditional EWG
>   "I wish…" EWG + RTR

In 6 of the 7 dialogues there was at least one refusal of the form:
>   all-past-tense conditional EWG + RTR

In 5 of these 7 dialogues there was at least one refusal of the form:
> 2nd conditional EWG + RTR

Item was given operational status.

Test Item Bank for Task Type 1 - **Item 4**

Title
Can I take the day off next Friday?

Status
unusable

Description
In this role-play participants play the roles of a boss and an employee. The employee requests permission to take a day off, because their son is playing in the state finals of a basketball tournament. The boss refuses, because the employee is scheduled to give an important presentation that day.

History of Iterations

1.1	Pilot 1	2.1

Item Bank for Task Type 1 - Item 4 (Iteration 1.1)

Can I take the day off next Friday?

B: The requester

Your role:	You design advertisements for a large advertising company. You have a son that is a talented high school basketball player.
The other role:	The other person is your boss.
Situation:	You're at work. Recently, you have been working on an advertising campaign for the well-known German car company VMW. Representatives from that company will visit your office next Friday. You are scheduled to give a presentation to get them to sign the contract. However, you just learned that your son's basketball team will compete in the state finals next Friday. The game is in the evening, but it is 3 hours away. In order to attend the game, you need the day off of work. Maybe someone else can do the presentation.
Instructions:	You will begin the role-play. Pretend to go to your boss's (the other person in this role-play's) office. You will ask him/her if you can have next Friday off of work.

A: The refuser

Your role:	You are the boss at a large advertising company.
The other role:	The other person is one of your employees. He/she designs advertisements.
Situation:	You're at work. Recently, one of your employees (the other person in this role-play) has been working on an advertising campaign for the well-known German car company VMW. Representatives from this company will visit your office next Friday. This employee is scheduled to give a presentation to get them to sign the contract. However, your employee wants the day off of work for family reasons. The reason for the request is a good one, but no one else knows the campaign well enough to give the presentation.
Instructions:	Wait for employee to begin the role-play. You want to help him/her, but you will refuse his/her request.

Test Item Bank for Task Type 1 - Item 4 (Pilot 1)

Results of Pilot 1
The "Can I have the day off?" role-play elicited a refusal from 10 out of 10 participants.

In 4 out of 10 dialogues there was at least one refusal of the form:
 EWG + RTR [Expression of willingness + reason to refuse]

In all of these 4 dialogues there at least one of the following sequences occurred:
 2nd conditional EWG
 "I wish…" EWG + RTR

In 4 of these 4 dialogues there was at least one refusal of the form:
 all-past-tense conditional EWG + RTR

In 3 of these 4 dialogues there was at least one refusal of the form:
 2nd conditional EWG + RTR

This role-play was not very successful at eliciting the target language. This may be related to the fact that in this role-play the refuser (the boss) has power over the requester (an employee).

Brown and Levinson (1987) posit a theory of politeness which states that the language used to perform polite acts is a function of its weightiness W, which in turn is a function of the three variable D = social distance between speaker and hearer, P = power of hearer over speaker, and R_x = size of the imposition. The relationship between these four variables can be stated as:

$$W = D + P + R_x$$

In this role-play, when the request "Can I have the day off?" is refused, the power of the hearer (the employee) over the speaker (the boss) is negative. Because of this, the overall weightiness of the refusal is relatively low (as compared with other role-plays). This would explain why relatively few participants issued expressions of willingness to grant a request in this role-play.

Pending an alternative explanation for why this role-play failed to elicit expressions of willingness, this item was given "unusable" status.

Sub-specifications for Task Type 2

Posited Illocutionary act
To demonstrate that something is true/false by using proof-by-contradiction

Status of Posited Illocutionary act
Consistent with data gathered in the first pilot of logic puzzles

Overview
Tasks are written prompts to be completed by 1 participant. Prompts are logic puzzles which require the participant to use counterfactual deductive reasoning to arrive at a solution.

Example of Target Language
If the heat lamp was off, then Sherlock would know that light switch 3 controls it. Therefore, the heat lamp is on.

Specifications
- **Requires Counterfactual Reasoning**
  - The puzzles will require participants to evaluate the truth of one or more key statements and explain why they are true/false. It will be possible to demonstrate that the key statements are true/false by employing "proof by contradiction," i.e. by first assuming that the statement has the opposite truth value, and then demonstrating that this leads to a contradiction.
  - Puzzles will be designed so that most (if not all) native speakers utilize "proof by contradiction" when solving the puzzle (as opposed to other types of deductive reasoning, such as syllogism). For recommendations on how to fulfill this criterion, see "Eliciting Counterfactual Reasoning" below.
- **Not Too Difficult**
  - Puzzles should be made relatively easy to solve (e.g., by providing hints, by providing the solution and asking for an explanation, by providing guiding questions which scaffold the task, etc.). Otherwise, there is a risk that performance will be affected by puzzle aptitude, rather than language ability.
- **Triggers present time reference**
  - Questions which prompt participants for information should have a present time reference. (e.g., "How do you know that Box A does not contain 5 cents?")

Eliciting Counterfactual Reasoning
Designing items that elicit counterfactual reasoning (as opposed to other deductive processes) can be quite challenging. Since it is more intuitive to start the reasoning process by considering what is known than it is to start by entertaining counterfactual possibilities, it should not be expected that participants will, in general, employ

counterfactual reasoning unless it is absolutely necessary to solve the problem (for an illustrative example of a puzzle that does *not* elicit counterfactual reasoning, refer to iteration 1.1 of test item 1, "The Boxes and the Coins").

So, how exactly does one design a logic puzzle for which the "path of least resistance" involves counterfactual reasoning? Although it is difficult to provide a general answer to this question, there seem to be at least two commonly occurring genres of logic puzzles which achieve this goal. These are described below. This is not intended to be an exhaustive list, but it should serve as a useful starting point for further development of test items.

Logic Puzzle Genre 1: Information Gap[23]
The prompt describes a situation in which…

1) …there are a group of entities, each of which has 2 or more possible states (e.g., light switches which are off or on; hats which are red, green, or blue; boxes which contain 5¢, 10¢, or 15¢);
2) …there is a character (the asker) who will pose a question about the state of one or more of the objects;
3) …there is at least one character (the answerer[s]) who knows the state of some (but not all) of the objects.

At least one answerer will be provided with information…
1) …whose type is known to the test taker (e.g., the amount of money in Box A);
2) …whose specific value is not known to the test taker (e.g., the amount of money is known to the answerer but not to the test taker);
3) …which, were it to have (a) specific value(s), would allow the answerer (but not the test-taker) to deduce the required information (e.g., If Box A contained 5¢, then Sherlock would know the contents of each of the other boxes.);
4) …which is insufficient to answer the asker's question and which therefore results in the answerer's replying, "I don't know." thereby allowing the test-taker to deduce that the information received by the answerer is different from the specific value(s) mentioned in criteria 3.

The test-taker will be provided with information…
1) … which is unknown to the answerer(s), or which the answerer(s) are not allowed to use, or which the answerer(s) are unwilling to use (e.g., the test taker learns the contents of Box B, but Sherlock does not).
2) …which, by itself, would be insufficient to answer the asker's question;
3) …which, when combined with the information deduced from the answerer's replies, is sufficient to answer the asker's questions.

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[23] The examples cited here all refer to the puzzle, "How much money is in the box?"

Logic Puzzle Genre 2: Liar Puzzles
The prompt gives several statements and specifies that a certain number of them are false. The test taker must then deduce which of the statements are true. For an illustrative example, refer to the puzzle, "Where in the world are Ms. Englund, Ms. Finn, and Ms. Lux?"

Transfer of Learning to Real-World Tasks
To some, the illocutionary act of "demonstrating that something is true/false by using proof-by-contradiction" may seem somewhat abstruse, without any relevance for real-world tasks. However, proof-by-contradiction is, in fact, an exceedingly common persuasive technique. Not only does it occur quite frequently in academia, but also in other domains as well. For instance, counterfactual reasoning can be used to:

- o explain that someone is lying (e.g., in a court room) by pointing out inconsistencies in a story
- o correct a misdiagnosis
    - of a health-related problem
    - of a learning disorder
    - of a mechanical/electrical problem (e.g., computer equipment, power outage, car problem, virus)
- o correct a misconception about the authenticity/value/safeness of something
    - explaining why a diamond is real/fake
    - explaining why food is safe/unsafe to eat
    - explaining why a website is safe/unsafe to use
- o eliminate fallacious explanations of a mysterious phenomenon (e.g., Benham's top, Bentley's Paradox)

The disadvantage of this task type is that even if learners master the use of counterfactual second conditionals within the limited domain of solving logic puzzles, it does not necessarily follow that they will transfer that knowledge to other domains. On the other hand, logic puzzles have the advantage that variables which affect the complexity of context and of range of vocabulary can more easily be controlled than in tasks which are more closely wed to the real world. At this point, it is unclear how these issues should be resolved, but serious consideration should be given to whether and how transfer of learning can be facilitated.

Procedure for Task Type 2

1) Prior to the session, randomly order the logic puzzles. Then, place page with copy of instructions (See next page) on top, and staple all pages together.
2) Seat participant in a quiet room.
3) Read the instructions out loud.
4) Leave participant alone and give them adequate time to complete puzzles.

Procedure for Task Type 2 - Instructions (Iteration 1.1)

Logic Puzzles

Instructions:
You will do several logic puzzles. For each puzzle, there is a story and one or more questions. Read the story carefully and answer the questions.

Please notice:

- Questions are always in *italicized* letters like this:

    Question: Do you understand?

- Important details are **<u>bold and underlined</u>** like this:

    <u>Bold, underlined words provide key information, so pay attention to them.</u>

Questions:
Before you begin, do you have any questions?

Procedure for Task Type 2 - Instructions (Iteration 2.1)

Logic Puzzles

Instructions:
You will read several stories. Each story involves a logic puzzle. At the end of each story, one of the characters will give the solution to the puzzle. However, the character does not explain HOW they figured out the solution. In other words, one or more steps of their thought process is missing.

Read each story carefully and answer the questions. By answering the questions, you will find out how the character solved each puzzle.

Please notice:

- Questions are always in *italicized* letters. For example:

  Question: Do you understand?

- Important details are **bold and underlined** like this:

  Bold, underlined words provide key information, so pay attention to them.

Questions:
Before you begin, do you have any questions?

Procedure for Task Type 2 - Instructions (Iteration 2.1)

Differences between Iteration 1.1 and 2.1

1. *Clarified what was expected of participant.* After the second round of piloting of logic puzzles, some participants reported being confused when they saw what appeared to be solutions to the logic puzzles at the bottom of each page. Although the final solution to each logic puzzle was provided, the reasoning process which led to that solution was not. In other words, the logic puzzles required participants to work out the reasoning process which led to the final solution, but not the final solution itself.

However, this was not explained to participants and may have caused the confusion which some participants reported. As a result of this feedback, for iteration 2.1 of the instructions, the researcher added information to clarify which information the participant was expected to provide.

History of Sub-specifications for Task Type 2

Prototype Tasks
   Test Items 1 through 3 were all based on standard logic puzzles taken from recreational puzzle magazines such as *Games* magazine. For more detailed descriptions, refer to specific items.

Revisions Made after the First Round of Pilot Testing
- **Eliciting Counterfactual Reasoning**
  After the first round of pilot testing of the logic puzzles, the researcher added to the test specifications a detailed description of two puzzle genres that may lend themselves to proof-by-contradiction: 1) information gap puzzles, 2) liar puzzles

  Rationale: Data elicited in the first round of pilot testing did not contain as many occurrences of proof-by-contradiction as had been hoped. This was especially true for item 1, "The Coins and the Boxes." Because this seemed to indicate that the test specifications were underspecified, the researcher attempted to uncover which task factors could be manipulated so as to increase the likelihood that proof-by-contradiction would be deployed (rather than other types of deductive reasoning) when solving the logic puzzles. The result of this attempt is the two puzzle genres outlined above.

- **Transfer of Learning to Real-World Tasks**
  Counterfactual conditionals which are used in proof-by-contradiction may not be perceived as having relevance for real-world tasks. Therefore, a list was added of some of the situations in which proof-by-contradiction can be used.

Test Item Bank for Task Type 2 - Item 1

Title
The Boxes and the Coins

Status
Operational

Description
This puzzle involves a set of boxes, each of which contains some amount of money. The goal of the puzzle is to deduce the amount of money in each box. This genre of logic puzzle is fairly common and can often be found in collections of recreational logic puzzles such as those found in *Games* magazine.

History of Iterations

1.1	Pilot 1	2.1	2.2	Pilot 2

Test Item Bank for Task Type 2 - Item 1 (Iteration 1.1)

LOGIC PUZZLES – Sherlock Holmes & His Assistant

Professor Moriarty's Puzzles

You are Sherlock Holmes's assistant. You are both in a castle, because you have been captured by the evil Professor Moriarty. Professor Moriarty has promised to release both of you, but first, you must solve two of his puzzles. (By the way, Sherlock Holmes has a really bad headache today, so he will need your help.)

Puzzle #1 – How much money is in the box?

Professor Moriarty places 3 boxes on a table (Box A, Box B, and Box C) (see Diagram 1). He says, "Here are 3 boxes. One of the boxes contains 5 cents, one of the boxes contains 10 cents, and one of the boxes contains 15 cents. Each box has a label, but each label is incorrect. Let me demonstrate."

Professor Moriarty opens Box B. Inside, there is 5 cents. "My question is simple:

"How much money is in Box A?"

Sherlock Holmes immediately says, "Because none of the labels are correct, we know that Box A cannot contain 5 cents."

Holmes thinks for a moment more and says, "It is also obvious that Box A does not contain 10 cents. Therefore, it has 15 cents."

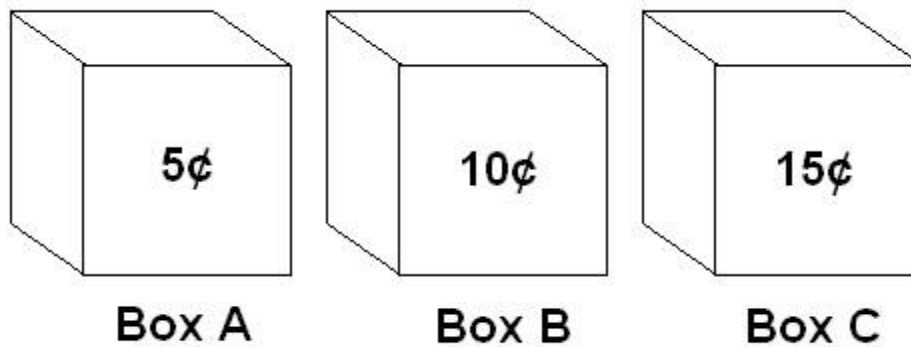*1a. How does Sherlock Holmes know that Box A does not contain 10 cents?*

Diagram 1 – Three Boxes

Test Item Bank for Task Type 2 - Item 1 (Pilot 1)

Results of Pilot 1

When iteration 1.1 was piloted, it elicited a proof-by-contradiction from only 2 of 20 participants (Participants 6 & 15).

Most participants (17 of 20) provided a sequence of deductions which demonstrated that Box A does not contain 10 cents. 2 participants (participants 5 & 16) provided a sequence of deductions, but incorrectly concluded that Box A *does* contain 10 cents. 1 participant, instead of providing a specific sequence of deductions, provided a description of a general problem-solving strategy for this type of puzzle: "None are marked correctly, A cannot contain 5¢, B cannot contain 10¢, etc. Eliminate the impossibilities and what is left is the solution."

The 19 participants that provided a sequence of deductions used the following strategies (as evidenced by the final step in their deductive process):

- proof of how much money actually *is* in Box A (14 participants)
- proof-by-contradiction (2 participants; participants 6 & 15)
- proof of how much money is in *each* box (2 participants; participants 1 & 3)
- proof that 10 cents is located in another box (1 participant; participant 12)

Of the 14 participants that proved how much money actually *is* in Box A, 2 (participants 5 & 16) incorrectly concluded that Box A contains 10 cents.

The test item needed to be further developed before it could be given operational status.

LOGIC PUZZLES – Sherlock Holmes & His Assistant

Professor Moriarty's Puzzles
      You are Sherlock Holmes's assistant. You are both in a castle, because you have been captured by the evil Professor Moriarty. Professor Moriarty has promised to release both of you, but first, you must solve two of his puzzles.

Puzzle #1 – How much money is in the box?
      Professor Moriarty places 3 boxes on a table (Box A, Box B, and Box C) (see Diagram 1). He says, "Here are 3 boxes. One of the boxes contains 5 cents, one contains 10 cents, and one contains 15 cents. Each box has a label, but at least two of the labels is incorrect. (In other words, maybe two boxes are labeled incorrectly, and maybe all three boxes are labeled incorrectly.)
      First, Professor Moriarty tells Sherlock Holmes to look inside Box A. Sherlock opens the box, looks inside, and closes it. Then, Moriarty asks Sherlock, "Based on the amount of money in Box A, how much money is in Box C?"
      Sherlock thinks for a moment and answers, "I don't know. I don't have enough information."
      Unfortunately, you were not able to see how much money was in Box A. However, you think for a moment and realize that Box A cannot contain 5 cents.

1a. How do you know that Box A does not contain 5 cents?

      Moriarty laughs and turns to you. He asks you to look inside Box B. You open the box, see that it contains 15 cents, and close it. Then, Moriarty repeats his question, "How much money is in Box C?"
      You smile and answer Moriarty's question, "Neither Box A nor Box B contains 5 cents. Therefore, Box C must contain 5 cents."
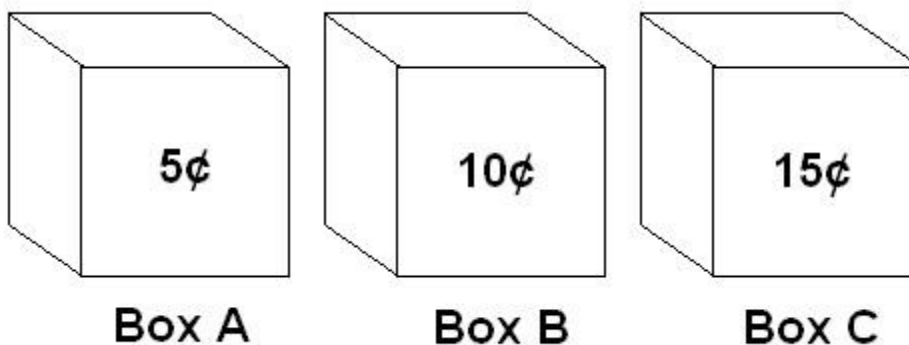

Diagram 1 – Three Boxes

Test Item Bank for Task Type 2 - Item 1 (Iteration 2.1)

Differences between Iteration 1.1 and 2.1

1. *Determinability of Box A's amount.* Overall, iteration 1.1 was very ineffective at eliciting counterfactual reasoning. Since most participants (14 of 20) used the strategy of determining the amount of money in Box A, they did not need to consider the logical consequences of Box A's not having 10 cents. In iteration 2.1 an attempt was made to prevent participants from exploiting such a strategy. Since this strategy depends on the amount of money in Box A being determinable, the test item was rewritten so that Sherlock's assistant would (initially) not have enough information to determine the amount of money in Box A.

2. *Anticipating participants' responses.* Participants' responses to iteration 1.1 were surprising. It was hoped that iteration 1.1 would elicit sentences such as:

  a) "If Box A contained 10 cents, then Box C would contain 15 cents."

Instead, most participants produced sentence which were (roughly speaking) semantically equivalent to:

  b) "Box C cannot contain 15 cents. Therefore, Box A must contain 15 cents."

The was especially surprising, since it was anticipated that the wording of the test item question ("How do you know that Box A *does not contain 10 cents*) would have a priming effect on participants, forcing them to entertain the possibility that Box A *does* have 10 cents.

One possible explanation for this is that participants may tend to produce arguments like argument b when the antecedent ("Box C cannot contain 15 cents") is fairly obvious. In order to realize that Box C cannot contain 15 cents, a participant need only recall that all boxes are labeled incorrectly, and in general, people probably tend to consider the information directly available and its implications before exploring counterfactual possibilities.

On the other hand, a test developer who is predisposed to think of counterfactual possibilities might easily overlook information that is "obvious" and "directly available." Therefore, to avoid eliciting similar data in future iterations, an attempt was made to devise a reliable means of anticipating participants' responses a priori. A logical analysis of the 2 arguments above suggests one possible way of doing this.

First, rewrite the 2 arguments as logical implications:
 1) (Box A contains 10 cents) implies (Box C contains 15 cents)
 2) (Box C does not contain 15 cents) implies (Box A contains 5 cents)

Next, recall that, by this point in the narrative, 10 cents and 15 cents were the only possible amounts for Box A and Box C (5 cents had already been eliminated). Therefore, within this context, "Box A contains 5 cents" (the consequent in sentence 2) is logically equivalent to "Box A does not contain 15 cents."

So, use this equivalence to rewrite the consequent in argument 2:
 1) (Box A contains 10 cents) implies (Box C contains 15 cents)
 2) (Box C does not contain 15 cents) implies (Box A does not contains 10 cents)

Now, the logical similarity between the 2 arguments finally reveals itself. The antecedent and consequent of argument 2 are, respectively, the negated consequent and negated antecedent of argument 1. In other words, argument 2 is the contrapositive of argument 1.[24]

Moreover, if this contrapositive had been constructed way back when iteration 1.1 was being written, it may have been possible to anticipate participants' responses *before* piloting it and to have made any necessary changes, saving time and effort.

The contrapositive can be used as a tool for anticipating potentially unwanted responses to test items. After a test item has been drafted and after the test developer has specified what the counterfactual conditional to be elicited is, he/she constructs the contrapositive. If the antecedent of the resulting contrapositive is a fact which seems fairly obvious, then it is reasonable to assume that participants may employ such reasoning when doing the test item, i.e. that they will *not* employ counterfactual reasoning.

On the other hand, if the resulting contrapositive is not an obvious fact, or alternatively if the contrapositive is extremely difficult to construct, then there is justifiable reason to anticipate that participants will be inclined to use counterfactual thinking.

This "contrapositive test" was used to evaluate iteration 2.1 after it had been written. Item 2 was designed to elicit an argument such as:

"If Box A had 5 cents, then Sherlock would know that Box C has 10 cents or 15 cents. However, he also knows that if Box C had 15 cents, then all the boxes would be labeled correctly. Therefore, he would conclude that Box C has 10 cents. But Sherlock doesn't know how much money is in Box C, so Box A can't have 5 cents."

In order to anticipate possible non-counterfactual responses to this item, the test developer attempted to construct the contrapositive to the above argument. This proved extraordinarily difficult (which is precisely what was hoped for). First, the

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[24] To construct the contrapositive of a counterfactual conditional (or any implication for that matter, one simply negates the antecedent and consequent and then reverses their order. In other words, the *contrapositive* of a statement like "A implies B" is "not B implies not A."

previous argument was massaged into a single counterfactual sentence which expresses the same basic argument:

"If Box A were labeled correctly, then Sherlock would only be able to imagine 1 way of putting the remaining amounts of money in Box B and Box C in such a way that at least 2 of the 3 boxes are incorrectly labeled."

The contrapositive of this statement (which is based on the fact that Sherlock doesn't know how much money is in Boxes B & C) would be:

"Regardless of the amount of money in Box A, Sherlock must be able to imagine at least 2 ways of putting the remaining amounts of money in Box B and Box C in such a way that at least 2 of the 3 boxes are incorrectly labeled. Therefore, the remaining amounts of money cannot be 10 cents and 15 cents."

Such an answer, were it elicited from participants, would be undesirable, because even though it is a logically valid answer to question 1a of iteration 2.1, it does not involve counterfactual thinking. On the other hand, it is extremely doubtful that participants would gravitate towards this particular line of thinking, since the argument is so convoluted. Therefore, this test item passes the "contrapositive test."

Test Item Bank for Task Type 2 - Item 1 (Iteration 2.2)

The Boxes and the Coins

You are Sherlock Holmes's assistant. You and he are in a castle, because you have been captured by the evil Professor Moriarty. Professor Moriarty has promised to release both of you, but first, you must solve one of his puzzles.

Professor Moriarty places 3 boxes on a table (Box A, Box B, and Box C) (see Diagram below). He says, "Here are 3 boxes. One of the boxes contains 5 cents, one contains 10 cents, and one contains 15 cents. As you can see, each box has a label. **However, at least two of these labels are incorrect**. (In other words, maybe two boxes are labeled incorrectly, and maybe all three boxes are labeled incorrectly.)

First, Professor Moriarty tells Sherlock Holmes to look inside Box A. Sherlock opens the box, looks inside, and closes it. Then, Moriarty asks Sherlock, "Based on the amount of money in Box A, how much money is in Box C?"

Sherlock thinks for a moment and answers, "I don't know. I don't have enough information."

Unfortunately, you were not able to see how much money was in Box A. However, you think for a moment and realize that Box A cannot contain 5 cents.

Question: How do you know that Box A does not contain 5 cents?

Moriarty laughs and turns to you. He asks you to look inside Box B. You open the box, see that it contains 15 cents, and close it. Then, Moriarty repeats his question, "How much money is in Box C?"

You smile and answer Moriarty's question, "Neither Box A nor Box B contains 5 cents. Therefore, Box C must contain 5 cents."
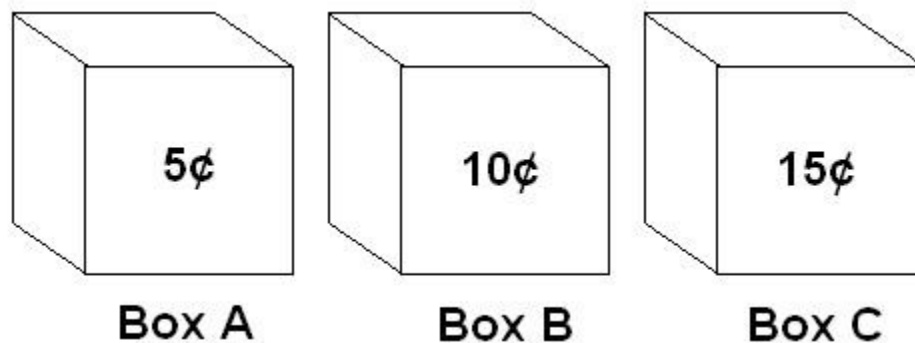

| 5¢ | 10¢ | 15¢ |
| Box A | Box B | Box C |

Diagram – Three Boxes

Test Item Bank for Task Type 2 - **Item 1 (Iteration 2.2)**

Differences between Iteration 2.1 and 2.2

1. *Removal of Question Title.* In iteration 2.1, the title was stated as a question ("How much money is in the box?"). This confused some participants, as they thought the purpose of the task was to answer that question. In iteration 2.2, the question title was removed in favor of a title which stated the topic of the puzzle.

2. *Bold-faced highlighting.* In iteration 2.2, words to be highlighted were not only underlined, but bold-faced as well. The motivation for this was based on feedback received about another item (See Item 2, Iteration 2.3).

Test Item Bank for Task Type 2 - **Item 1 (Pilot 2)**

Results of Pilot 2
Item elicited proof-by-contradiction from 17 out of 20 participants.

Of the 17 proof-by-contradictions elicited, 16 involved past-tense-only conditionals, and 14 involved second conditionals.

Compared to test items 2, 3, and 4, this item elicited a relatively high number of second conditionals. However, the researcher was unable to isolate which task factors (if any) may have contributed to this difference.

Item was given operational status.

Test Item Bank for Task Type 2 - Item 2

Title
The Heat Lamp

Status
Operational

Description
The inspiration for this test item was a classic logic puzzle which has existed for many years and can often be found in collections of recreational logic puzzles (e.g., such as those found in *Games* magazine). In the original version, a single individual must determine which of 3 light switches controls the light bulb in the next room. This individual has one opportunity to turn the light switches off or on, and then this person must enter the room containing the light bulb in order to make a determination. For testing purposes, the puzzle was adapted so two people must solve the puzzle collaboratively.

The puzzle, in its original form, would not have elicited second conditionals, because all relevant facts are either unknowable (e.g., whether the light will be on when the person enters the next room) or knowable directly through sensory input (e.g., which light switches get turned on when). However, in order to elicit the target language, the puzzle had to be adapted so that there is a key piece of information which is knowable, but only knowable through deduction. Therefore, the puzzle was adapted so that although the participant has no sensory information about the light in the next room, there is sufficient information to deduce whether it is on.

History of Iterations

1.1	Pilot 1	2.1	2.2	2.3	Pilot 2

Test Item Bank for Task Type 2 - Item 2 (Iteration 1.1)

Puzzle #2 - Which switch controls which light?
        Professor Moriarty is frustrated, because Sherlock Holmes solved his first puzzle so easily. He says, "The first puzzle was easy, but you will need your assistant's help for this next puzzle, Holmes!"
        Professor Moriarty puts both of you in a room (see Diagram 2) which has 3 light switches and a door. All of the light switches are off. Then he laughs and says, "Behind the door, there is a single light. That light is controlled by one of these 3 light switches. My question is simple:

"Which light switch controls the light?

        "To answer this question, you may turn the switches off and on as many times as you like, but you may open the door only once. After you open the door, you may not use the switches again."
        Without thinking, Holmes turns light switch #1 on. But then he pauses and says, "Uh oh. There's a problem. Light switch #2 and light switch #3 are both off, so there's no way to tell the difference between them."
        You think for a moment and say, "Wait, Holmes. I have an idea."
        You wait 10 minutes, and then you turn light switch #2 on (Now, light switch #1 and light switch #2 are both on, and light switch #3 is off.) You tell Sherlock Holmes to enter the room, so he opens the door and enters the room. You cannot see the light. Sherlock Holmes yells, "Your idea didn't work. I still don't know which light switch controls the light."

2a. Is the light off or on? How do you know?

        You yell a suggestion to Sherlock Holmes. This suggestion will help Sherlock Holmes figure out which light switch controls the light.

2b. Why did you wait 10 minutes? (Hint: think about the light bulb)

2c. So what was your suggestion to Holmes?

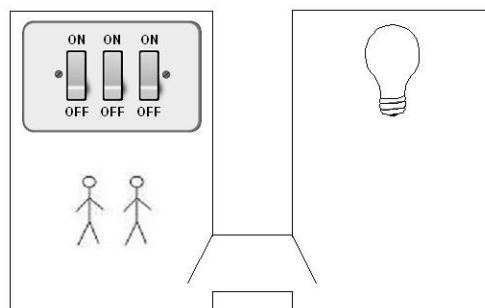*2d. Why will this help him to answer Professor Moriarty's question?*

Diagram 2 – Three Light Switches

Test Item Bank for Task Type 2 - Item 2 (Pilot 1)

Results of Pilot 1
When iteration 1 was piloted, it elicited a proof-by-contradiction from 8 of 20 participants.

Ten participants correctly deduced that the light was on. Of these 10 participants, 7 utilized proof-by-contradiction. Of the 3 participants that did not use proof-by-contradiction, 2 gave reasons which presumed the thing they were trying to demonstrate, i.e. that the light was on, and 1 (participant 7) provided a reason which, though it was a true statement, only implicated a proof-by-contradiction and did not unambiguously prove that the light was on.

Nine participants incorrectly deduced that the light was off. Of these 9 participants, 7 said that the reason the light was off is that the light cannot be seen. In most cases, they cited the text directly: "You cannot see the light." Of the 2 remaining participants, 1 presumed the thing they were trying to demonstrate, i.e. that the light was off, and the other participant (participant 15) even demonstrated that the light was off using (surprisingly) a proof-by contradiction.

One participant said that the information was insufficient to make a determination.

Twelve participants understood that the reason for waiting 10 minutes was related to the heat of the bulb. Two participants thought the reason for waiting was related to brightness, 1 participant thought it was related to fluorescence, and 5 participants said that they did not know the reason for waiting.

Of the 8 elicited proof-by-contradictions, 6 were valid reasons that the light was on. Of the 2 incorrect sentences, 1 sentence (participant 2's) involved a juxtaposition of the if-clause and would-clause, and 1 sentence (participant 15's) was an incorrect justification for why the light was *off.* The latter sentence admittedly involved a valid argument but was based on the incorrect assumption that light switch 1 gets turned off.

The item did not seem to be clearly written, so it would need to be revised before it could be given operational status.

Test Item Bank for Task Type 2 - **Item 2 (Iteration 2.1)**

Puzzle #2 - Which light switch controls the heat lamp?
Professor Moriarty takes you and Sherlock to a hallway with 2 doors (Diagram 2). He explains, "In one of the rooms (Room 1) there are 3 light switches. In the other room (Room 2) there is a powerful heat lamp. The heat lamp is controlled by one of the switches."
Then, he leaves Sherlock in the hallway and takes you into Room 1. He closes door B before opening door A, so that Sherlock cannot see inside the room. After entering, you look around and see that the 3 switches in Room 1 are all off. In addition, there is a digital screen (which is blank).
Moriarty says, "All of the switches will turn the screen on for exactly 1 second. The screen briefly displays the temperature in the other room (Room 2) and then turns itself off. As I said before, one of these 3 switches also controls a powerful heat lamp in Room 2.
"Here are the rules. You may turn on a maximum of two switches (In other words, you may not turn all three switches on.). After you turn a switch on, you may not turn it off. When you are finished, you may tell Sherlock which switches are on and which are off, but you may not give him any other information. Then, you will remain in the hallway, and Sherlock will enter Room 2. After that, you and he will each have a chance to answer this question: Which switch controls the heat lamp?
You think for a while and finally come up with a plan. First, you turn on light switch 1. When you do this, the screen briefly shows 18.0°C and then goes blank. Next, you wait 30 minutes and then turn on light switch 2. Again, the screen shows 18.0°C and goes blank. The screen was only on for 1 second, so you do not know whether switch 2 had any effect. On the other hand, you now know that switch 1 definitely does not control the heat lamp.
You and Moriarty exit the room. Moriarty closes door A before opening door B, so that Sherlock cannot see inside the room. You tell Sherlock that switch 1 and switch 2 are both on, and that switch 3 is off.
Then, Moriarty takes Sherlock inside the other room (Room 2). He closes door D before opening door C, so that you cannot see whether the heat lamp is on. A few moments later, they exit the room. Moriarty closes door C before opening door D, so you still cannot see whether the heat lamp is on.
Moriarty asks Sherlock which switch controls the heat lamp, and he responds, "I don't know."

2a. Is the heat lamp off or on? How do you know?

Moriarty turns to you and asks which switch controls the heat lamp. You smile and say, "Neither Switch 1 nor switch 3 controls it. Therefore, switch 2 must control it."
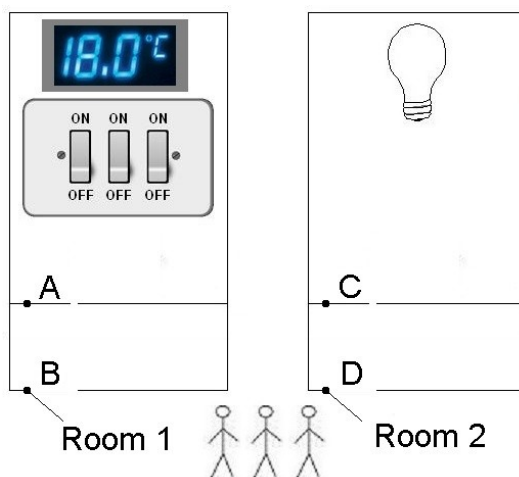

Diagram 2 – Three Light Switches

Test Item Bank for Task Type 2 - Item 2 (Iteration 2.1)

Differences between Iteration 1.1 and 2.1

1. *"Cannot see the light."* The biggest problem with iteration 1.1 was that a significant number of participants (7 of 20) believed (incorrectly) that the light was off and that this information was known to Sherlock's assistant via sensory input, citing the reason that Sherlock's assistant "cannot see the light." Although the intended meaning of this phrase was that the assistant "cannot see whether the light is on," these participants seemed to have construed the meaning as something like "cannot see light emanating from the room."

The main reason for this misunderstanding is probably that the wording used in iteration 1.1 was a bit ambiguous:

"You cannot see the light."

Actually, the choice of this particular wording was quite intentional. It was used to avoid the grammatically more complex sentence, "You cannot see whether the light is on." However, considering that this item is intended to be read by NNS's who will be expected to know how to use second conditionals (which are arguably even more complex than "whether" clauses), this fear was probably unwarranted. For the sake of clarity the following less ambiguous wording was used in iteration 2.1:

"…you cannot see whether the heat lamp is on."[25]

Even though the problem phrase ("You cannot see the light.") was clearly ambiguous, it was still surprising that so many participants would think that the light is visible. It was expected that the diagram in iteration 1.1 would clearly convey that Sherlock's assistant cannot see into room 2, since the diagram shows 2 doors whose purpose is to allow Sherlock to enter Room 2 without his assistant being able to see inside. Possible reasons for this were revealed by several participants (in informal discussions after the test sessions). Some participants thought that both doors are opened at the same time (just as they are depicted in the diagram), and one participant did not even understand that the purpose of the doors was to block any possible light, pointing out that light would be visible from underneath the door.

To address these problems, several changes were made for iteration 2.1. For starters, the diagram was altered so that one of the doors leading into each room is closed.[26] Also, both the fact that the doors get shut and the purpose of the doors were explicitly mentioned:

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[25] The reason that "light" was changed to "heat lamp" is explained below.
[26] The total number of doors was changed from 2 to 4. The reason for this is explained below.

"Then, Moriarty takes Sherlock inside the other room (Room 2). He closes door D before opening door C, so that you cannot see whether the heat lamp is on. A few moments later, they exit the room. Moriarty closes door C before opening door D, so you still cannot see whether the heat lamp is on."[27]

2. *Heat of the bulb.* Another problem with iteration 1.1 is that several participants did not think to check the heat of the bulb. As stated in the specifications, iteration 1.1 was intended to be relatively easy to solve. This is why it includes a hint which specifies that Sherlock's assistant waits 10 minutes before turning on light switch 2.[28] It was believed that this hint would be sufficient to enable participants to infer that Sherlock's assistant should recommend testing the heat of the bulb. However, several participants could not understand the relevance of waiting.

The fact that some participants failed to consider the heat of the bulb was not entirely surprising. After all, this test item was based on a classic logic puzzle which was specifically designed to require lateral thinking. The reason that the relevance of waiting is not immediately obvious is because it is much more intuitive to think of a light bulb in terms of its function (producing light) than it is to focus on a normally irrelevant feature of light bulbs (heat).

Therefore, requiring participants to use lateral thinking renders the solution less than obvious. However, it was believed that retaining the "lateral thinking" aspect of the puzzle would render the item more engaging and thereby increase its pedagogical value. However, after the pilot of iteration 1.1, it became clear that the effect this would have on participants' ability to actually complete the puzzle had been underestimated.

To render the puzzle easier to solve, in iteration 2.1, the light bulb was changed to a heat lamp. Since a heat lamp's primary function is to produce heat, lateral thinking should no longer be necessary to arrive at the solution. A potential negative consequence of this is that iteration 2.1 may be perceived by participants as less challenging and, as a result, perhaps even less interesting. However, this was deemed acceptable, since making an item *too* challenging is in direct conflict with the specification for Task Type 2 that puzzles be fairly easy to solve.[29]

3. *Plausibility of narrative.* Another problem with iteration 1.1 is its plausibility. Specifically, it is odd that even though Sherlock Holmes, a detective of the highest caliber, had access to all the necessary information (viz., the light is on, switch 1 had been on 10 minutes, switch 2 had just been turned on, and switch 3 was off), he did not

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[27] "C" and "D" refer to labeling used in the diagram.

[28] (the puzzle which served as the inspiration for this test item leaves it up to the reader to come up with the idea of waiting).

[29] An alternative way of simplifying a task, while simultaneously keeping it challenging and engaging, is to allow participants to calibrate it to their own level. More specifically, test items could be delivered via computer, and hints could be provided only if participants request them. Although this approach was considered, the researcher did not have access to the appropriate technology, so he deemed it impractical.

think to test the heat of the light bulb himself. In fact, considering that Sherlock Holmes's extraordinary detective skills are world famous, some participants may have even assumed that the reason Sherlock himself does not solve the puzzle is precisely because he did *not* have access to all the necessary information. Moreover, if a participant acted on this reasonable (albeit incorrect) assumption, it may have caused them to misinterpret the narrative.

This narrative was recognized as problematic even before piloting. The reason it developed as it did is because the test developer was attempting to resolve two conflicting forces. On the one hand, the nature of the item requires that Sherlock's assistant not have direct knowledge that the light is on; i.e. the assistant cannot enter room 2. Otherwise, there would be no need for the assistant to deduce that the light is on, and the following sentence would not be elicited:

"If the light were off, Sherlock would know which light switch controls the light."

On the other hand, in order to be able to solve the puzzle, Sherlock's assistant must find out the heat of the bulb. Since the assistant cannot enter room 2, the only other way that the assistant can learn this information (or so it was thought when iteration 1.1 was being written) was to have Sherlock test the heat of the light bulb himself and then to relay this information to the assistant. However, since this is incompatible with Sherlock's skills as a detective, this negatively affects the plausibility of the story.

Fortunately, an alternative way was found to resolve the conflict. In iteration 2.1, a digital screen was introduced into room 1 (the room with the light switches) which is connected to a thermometer in room 2 (the room with the light bulb). Rather than feeling the heat of the light bulb after switch 1 has been on for 10 minutes, Sherlock's assistant looks at the readout from the thermometer to measure how much the ambient temperature of room 2 changes over the course of 10 minutes. In order to insure that Sherlock never gains access to this information, the narrative was changed so that Sherlock never enters room 1.[30]

It was also specified that the display only comes on when a light switch is turned on, and that the display turns off after a brief time (1 second). This insures that the assistant must flip a second switch in order to learn the effect of the first switch. If this were not the case, i.e. if the digital display were to remain on the whole time, then the assistant could determine the effect of a switch simply by switching it on and waiting.

It was further specified that the assistant is limited to turning on 2 switches. If this were not the case, i.e. if the assistant were allowed to turn the light switches on an unlimited number of times (as in iteration 1.1), then the effect of each switch could be determined without consulting Sherlock, and consequently it would no longer be necessary for the assistant to make any deductions.

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[30] It was because of this that separate entrances were made for each room. Since neither Sherlock nor his assistant enter both rooms, there was no longer any rationale for having the rooms remain connected.

As a result of the changes, iteration 2.1 turned out to be lengthier than iteration 1.1, but as a result (or so it was hoped), clearer and more plausible.

4. *Omission of zero conditional questions.* In iteration 1.1, since Sherlock was the one that checked the heat of the bulb, it was possible to withhold from the participant whether the light bulb was hot, and thereby make it possible to include a question (iteration 1.1, question 2d) designed to elicit a zero conditional such as:[31]

"If the light is hot, then it is controlled by light switch 1."

However, in iteration 2.1, as mentioned above, in order to render the narrative more plausible, Sherlock's feeling the light bulb was replaced by the assistant's checking a thermometer. Unfortunately, since the item is designed to place the reader into the role of Sherlock's assistant, it was no longer possible to withhold from the participant whether the light had heated up. However, this was considered an acceptable loss, since the inclusion of a zero conditional question was motivated by economy, not necessity.

5. *Evaluation of results.* Two of the counterfactual conditionals which were elicited from the pilot of iteration 1.1 were factually incorrect sentences. One of these sentences (participant 2's) involved a juxtaposition of the if-clause and would-clause:

"If 3 [were the switch that controlled the light], it [the light] would be off so it must be on."

The other sentence (participant 15's) was a reason to justify why the light was *off*:

"The light is off, because otherwise Holmes would know that it is switch 2."

This latter sentence seems to be based on the (incorrect) presupposition that switch 2 is the only switch that is on; i.e. this person probably believed that switch 1 got turned off.

These two examples were both atypical, relative to other participants' responses. However, they underscore the potential difficulties in how results are to be evaluated.

The consequent in participant 2's sentence ("…it [the light] would be off…"), if interpreted literally, is based on the presupposition that the light is on. However, if we read the end of the sentence ("…so it [the light] must be on."), it becomes clear that participant 2 does not intend to use the presupposition that the light is on to demonstrate that light switch 3 does not control it, but rather is attempting to provide a justification for why the light is on (which is what question 2a had asked for). In other words, there is evidence here that what participant 2 said is not, in fact, precisely what he meant. A naïve explanation is that although participant 2 can produce well-formed

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[31] The motivation for eliciting zero conditionals, in addition to second conditionals, is explained in the general specifications for this task type.

second conditionals, he does not, in general, know precisely what they mean. However, in light of the fact that participant 2 is a NS of English, a more plausible explanation is that his answer was simply a careless mistake. But when evaluating the results of items of this type, should "careless mistakes" even be considered? If so, how can they objectively be categorized as "careless mistakes"?

In contrast to Participant 2, Participant 15's utterance actually answers the question. However, the answer provided is incorrect. The simplest explanation is that participant 15 had misread the item and believed that switch 1 got turned off. Although there is no direct evidence that he thought switch 1 got turned off (he never stated this), his answer for 2d would be consistent with such an assumption.

"…if the bulb is not hot, then it is switch 3 that runs the bulb. Otherwise, if it's hot, then it is switch 1."

Participant 15 stated that the light bulb was off. Therefore, the fact that Participant 15 considers both switches 1 and 3 as candidate solutions is consistent with the assumption that Participant 15 believes switch 1 to be in the same state as switch 3 (i.e. off). Therefore, although Participant 15 seems to have misread the problem, he seems to have accurately expressed what it is he wanted to say; i.e. even though his sentence was factually incorrect, there is convincing evidence here that he knows how to use second conditionals.

This extensive discussion of participant 2 and participant 15's results are provided to underscore 2 important points: 1) that the evaluation of results should be a reflection of the purpose of the test items, i.e. to determine whether participants understand how to use counterfactual second conditionals, and 2) that multiple factors should be considered when evaluating results. The purpose is not to determine whether participants can construct valid arguments, nor is it even to determine *whether* participants use counterfactual reasoning. Rather, the purpose is to determine whether those participants that *do* use counterfactual reasoning do so in a meaningful and grammatically correct way.

On the other hand, to make such a determination, it may nevertheless be necessary to consider participants' actual arguments, although it not clear at this point what sorts of inferences can be made from factually incorrect or logically invalid arguments. Therefore, problematic responses such as participant 2's and participant 15's are useful in that they will inform future discussions on this matter.

Test Item Bank for Task Type 2 - Item 2 (Iteration 2.2)

Puzzle #2 - Which light switch controls the heat lamp?

Definition:
A *heat lamp* is a powerful lightbulb which is designed to produce both light and heat.

       Professor Moriarty takes you and Sherlock to a hallway with 2 doors (Diagram 2). He explains, "In one of the rooms (Room 1) there are 3 light switches. In the other room (Room 2) there is a powerful heat lamp. The heat lamp is controlled by one of the switches."
       Then, Moriarty leaves Sherlock in the hallway and takes you into Room 1. When entering the room, you must go through 2 doors. Therefore, Sherlock (who is still in the hallway) cannot see inside the room. After entering, you look around and see that the 3 switches in Room 1 are all off. In addition, there is a digital screen (which is blank).
       Moriarty says, "All of the switches will turn the screen on for exactly 1 second. The screen briefly displays the temperature in the other room (Room 2) and then turns itself off. As I said before, one of these 3 switches also controls a powerful heat lamp in Room 2."
       Moriarty continues, "Here are the rules. You may turn on a maximum of two switches (In other words, you may not turn all three switches on.). When you are finished, you may tell Sherlock which switches are on and which are off, but you may not give him any other information. Then, you will remain in the hallway, and Sherlock will enter Room 2. After that, you and he will each have a chance to answer this question: Which switch controls the heat lamp?"
       You think for a while and finally come up with a plan. First, you turn on light switch 1. When you do this, the screen briefly shows 18.0°C and then goes blank. You leave light switch 1 on and wait 30 minutes. Then, you turn on light switch 2. Again, the screen shows 18.0°C and goes blank. The screen was only on for 1 second, so you do not know whether switch 2 had any effect. On the other hand, you now know that switch 1 definitely does not control the heat lamp.
       You and Moriarty exit the room. You tell Sherlock that switch 1 and switch 2 are both on, and that switch 3 is off. You do not tell Sherlock any other information.
       Then, Moriarty leaves you in the hallway and takes Sherlock inside the other room (Room 2). Just like room 1, there are 2 doors to prevent someone outside the room from seeing inside the room. Therefore, you cannot see whether the heat lamp is off or on. A few moments later, they exit the room.
       Moriarty asks Sherlock which switch controls the heat lamp, and he responds, "I don't know."

2a. Is the heat lamp off or on? How do you know?

       Moriarty turns to you and asks which switch controls the heat lamp. You smile and say, "Neither switch 1 nor switch 3 controls it. Therefore, switch 2 must control it."
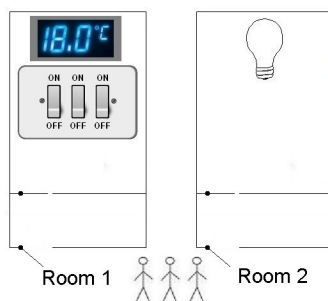

Diagram 2 – Three Light Switches

Test Item Bank for Task Type 2 - Item 2 (Iteration 2.2)

Differences between Iteration 2.1 and 2.2

1. *Salience of the information gap.* Several people reported that when reading iteration 2.1, it took them a while to realize that Sherlock never enters room 1 and that Sherlock's assistant never enters room 2. Since these 2 facts are absolutely essential to establishing the information gap between Sherlock and his assistant, in iteration 2.2, underlining was added to the relevant parts of the text. E.g.:

"<u>Then, Moriarty leaves Sherlock in the hallway and takes you into Room 1.</u>"

2. *Explanation of doors.* Several people reported that the detailed descriptions of the doors involving the labels A, B, C, and D, though very clear, were overly complicated. Therefore, in iteration 2.2, the lettering was eliminated and simpler wording was used:

"When entering the room, you must go through 2 doors. Therefore, Sherlock (who is still in the hallway) cannot see inside the room."

3. *Definition of "heat lamp."* An NNS colleague who was an advanced speaker of English commented that NNS's may not be familiar with the word "heat lamp," so the following short definition was added:

"**Definition:**
A *heat lamp* is a powerful light bulb which is designed to produce both light and heat."

Test Item Bank for Task Type 2 - Item 2 (Iteration 2.3)

The Heat Lamp

Definitions:
A *heat lamp* is a powerful light bulb which is designed to produce both light and heat.
A *blindfold* is something (such as a cloth) that covers someone's eyes to prevent them from seeing.

You are Sherlock Holmes's assistant. You and he are in a castle, because you have been captured by the evil Professor Moriarty. Professor Moriarty has promised to release both of you, but first, you must solve one of his puzzles.

Professor Moriarty takes you and Sherlock into Room 1 (see Diagram below) which has 3 light switches, a digital screen, and a door. All the light switches are off, and the digital screen is blank.

Moriarty explains, "In the next room (Room 2), there is a powerful heat lamp. The heat lamp is controlled by one of these 3 light switches."

Moriarty continues, "Only one switch will turn the heat lamp on, but all of the switches will turn the screen on. The screen will briefly display the temperature in the next room (Room 2) and then turn itself off."

Moriarty stops speaking and places a blindfold over Sherlock's eyes, so that Sherlock cannot see. Then, Moriarty turns to you and continues, "Here are the rules. You may turn on two switches. After that, I will remove Sherlock's blindfold. Then, Sherlock will enter the next room (Room 2). Finally, you and he will each have a chance to answer this question: Which switch controls the heat lamp?"

You think for a while and finally come up with a plan. First, you turn on light switch 1. When you do this, the screen briefly shows 18.0°C and then goes blank. After that, you leave light switch 1 on and wait 30 minutes. Then, you turn on light switch 2. Again, the screen shows 18.0°C and goes blank. The screen only comes on for one second, so you do not know whether the temperature in Room 2 increased after you turned on switch 2. On the other hand, you now know that switch 1 definitely does not control the heat lamp.

Moriarty removes Sherlock's blindfold. **Sherlock can see that switch 1 and switch 2 are both on, and that switch 3 is off. However, he does not know which light you turned on first.** Also, since the screen is blank, he does not know whether the temperature of Room 2 has changed.

At this point, **Moriarty leaves you alone in Room 1 and takes Sherlock into the next room (Room 2)**. When entering Room 2, Sherlock must go through 2 doors. This is to prevent someone in Room 1 from seeing inside Room 2. Therefore, you cannot see whether the heat lamp is off or on. A few moments later, Moriarty and Sherlock exit Room 2.

Moriarty then asks Sherlock which switch controls the heat lamp, and he responds, "I don't know."

Question: Based on Sherlock's answer, is the heat lamp off or on? How do you know?

Moriarty turns to you and asks which switch controls the heat lamp. You smile and say, "Neither switch 1 nor switch 3 controls it. Therefore, switch 2 must control it."
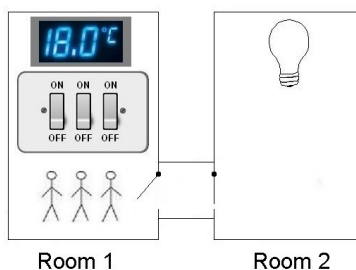

Diagram – Three Light Switches

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Test Item Bank for Task Type 2 - Item 2 (Iteration 2.3)

Differences between Iteration 2.2 and 2.3

1. *Simplification of the information gap.* One colleague had commented that iteration 2.2 was "complex and wordy." The wordiness, he felt, was largely the result of there being so many doors. However, he also recognized that the doors serve an important purpose (i.e. to create an information gap). To make the item more concise, he recommended a simpler way of creating an information gap, namely to blindfold Sherlock. In iteration 2.3, a blindfold has been incorporated into the narrative.

2. *Removal of question title.* One colleague thought that the title at the top of iteration 2.2 ("Which light switch controls the heat lamp?") was one of the questions she was supposed to answer. However, when she got to the bottom of the page, she became confused, since the answer is already provided there. Also, she felt that she ended up focusing her attention too much on the question posed in the title, which in turn caused her to miss key details. In iteration 2.3, since there seemed to be no compelling reason to keep Moriarty's question in the title, it was omitted and replaced by a title which stated the topic of the puzzle.

3. *Bold-faced highlighting.* After reading iteration 2.2, one colleague reported that she had not noticed that certain words had been textually enhanced with underlining. She suggested that making the relevant text bold-faced would make it more salient. In iteration 2.3, words to be highlighted were both underlined and bold-faced.

4. *Smoother transition added.* After reading iteration 2.2, one colleague commented that when she had first read question 2a, it seemed unrelated to what she had come before. To make the transition smoother and the relevance more salient, in iteration 2.3, the transition "Based on Sherlock's answer…" was added.

Test Item Bank for Task Type 2 - **Item 2 (Pilot 2)**

Results of Pilot 2
Item elicited proof-by-contradiction from 15 out of 20 participants.

Of the 15 proof-by-contradictions elicited, 14 involved past-tense-only conditionals, and only 11 involved second conditionals.

This item did not elicit as high a number of second conditionals as test item 1 did. However, the researcher was unable to isolate which task factors (if any) may have contributed to this difference.

On the other hand, there was a sufficient number of past-tense-only conditionals to merit giving the item operational status.

Test Item Bank for Task Type 2 - **Item 3**

Title
The Robbers

Status
Pending additional NS pilot testing

Description
This puzzle involves 3 criminals (Ms. Roberts, Ms. Stevens, and Ms. Thompson) each of whom is in one of 3 countries (England, Finland, and Luxembourg) and several sentences which give information about who is where. However, we learn that only one of these sentences is true. The goal of the puzzle is to figure out which woman in which country. In order to accomplish this, the participant must determine which sentence is the true one.

This puzzle is a "liar" puzzle, i.e. a collection of sentences whose truth value must be determined. This genre of logic puzzle is fairly common and can often be found in collections of recreational logic puzzles (e.g., such as those found in *Games* magazine).

Because this puzzle was anticipated to be somewhat challenging, two questions (rather than one) were provided in order to provide scaffolding. If answered correctly, the scaffolding questions will enable participants to establish, by process of elimination, that Ms. Stevens is in England.

History of Iterations

1.1	Pilot 1	2.1	2.2	Pilot 2

Test Item Bank for Task Type 2 - Item 3 (Iteration 1.1)

Puzzle #3 - Where in the world are Ms. Englund, Ms. Finn, and Ms. Lux?
Professor Moriarty is angry that you managed to solve his puzzles so easily, but he releases you and Sherlock Holmes, just like he promised. However, your work is not finished. You and Sherlock Holmes return to Sherlock's office and start working on the next mystery.

Ms. Englund, Ms. Finn, and Ms. Lux are 3 international criminals that are planning a bank robbery somewhere in Europe. The police know that one of them is in England, one of them is in Finland, and one of them is in Luxembourg. They have asked Sherlock Holmes to find out which of the 3 women is in England. Sherlock has collected the following information:

1) Ms. Lux is in England.
2) Ms. Lux is not in Finland.
3) Ms. Englund is not in Finland.
4) Ms. Englund is not in Luxembourg.

However, Sherlock has just learned that <u>only 1 of these sentences is actually true. The other 3 sentences are false.</u> Unfortunately, no one has told him which sentence is the true one. He studies the clues very carefully and then shouts, "Aha! The woman that is in England is definitely not Ms. Lux." He studies the clues for a while longer and then says, "I see! The woman that is in England is definitely not Ms. Englund either." Sherlock Holmes smiles. You realize that he has solved yet another case and that the woman in England is Ms. Finn.

3a. How does Sherlock Holmes know that Ms. Lux is not in England?

3b. How does Sherlock Holmes know that Ms. Englund is not in England?

Test Item Bank for Task Type 2 - Item 3 (Pilot 1)

Results of Pilot 1
When iteration 1.1 was piloted, the first question elicited a proof-by-contradiction from 9 of 20 participants. The second question elicited a proof-by-contradiction from 6 of those 9 participants. None of the 11 participants who failed to provide a proof-by-contradiction for the first question provided a proof-by-contradiction for the second question.

Of the 9 participants who provided a proof-by-contradiction for the first question, 8 provided correct arguments, and 1 (participant 7) gave an incorrect answer. The 6 participants who provided a proof-by-contradiction for the second question, all provided correct arguments. The 3 participants (participants 14, 16, & 20) who did not provide a proof-by-contradiction for the second question provided respectively a correct proof by cases (14), a general description of the problem solving process (16), and a correct (but unjustified) specification of where each woman is (20).

Of the 11 participants that did not provide a proof-by-contradiction for either question, 8 participants attempted to demonstrate that "Ms. Lux *is* in England" using some combination of the following strategies:

- claim that a statement other than statement 1 is true
- claim (or implicate) that Ms. Lux is somewhere else
- claim that someone else is in England
- claim the statement to be proven
- give a description of a general problem-solving strategy

Of these 8 participants, 4 (participants 1, 4, 18, & 19) answered both questions correctly but did not provide adequate justification, and 4 (participants 6, 8, 9, & 17) encountered various difficulties: 1 participant (participant 6) answered the first question incorrectly and provided a description of a general problem-solving strategy for the second question, 1 participant (participant 8) simply claimed the statement to be proven for the first question and answered the second question incorrectly, 1 participant (participant 9) answered both questions incorrectly, and 1 participant (participant 17) answered the first question incorrectly and was unable to answer the second question.

There were 3 participants (participants 2, 3, & 5) who were unable to answer either question.

The item seemed to be too difficult. However, the researcher hoped that by scaffolding the thought process, it might be possible to salvage the item (See iterations 2.1 and 2.2).

Test Item Bank for Task Type 2 - Item 3 (Iteration 2.1)
Puzzle #3 – Where in the world are Ms. Englund, Ms. Finn, and Ms. Lux?

Professor Moriarty is angry that you managed to solve his puzzles so easily, but he releases you and Sherlock Holmes, just like he promised. However, your work is not finished. You and Sherlock Holmes return to Sherlock's office and start working on the next mystery.

Ms. Englund, Ms. Finn, and Ms. Lux are 3 international criminals that are planning a bank robbery somewhere in Europe. The police know that one of them is in England, one of them is in Finland, and one of them is in Luxembourg. They have asked Sherlock Holmes to find out which of the 3 women is in England. Sherlock has collected the following information:

1) Ms. Lux is in England.
2) Ms. Lux is not in Finland.
3) Ms. Englund is not in Finland.
4) Ms. Englund is not in Luxembourg.

However, Sherlock has just learned that <u>only 1 of these sentences is actually true. The other 3 sentences are false.</u> Unfortunately, no one has told him which sentence is the true one. He studies the clues very carefully and then shouts, "Aha! The woman that is in England is definitely not Ms. Lux." He studies the clues for a while longer and then says, "I see! The woman that is in England is definitely not Ms. Englund either." Sherlock Holmes smiles. You realize that he has solved yet another case and that the woman in England is Ms. Finn.

3a. How does Sherlock Holmes know that Ms. Lux is not in England?
   (Hint: Think about sentences 1 and 2.)

3b. How does Sherlock Holmes know that Ms. Englund is not in England?
   (Hint: Think about sentences 3 and 4.)

Test Item Bank for Task Type 2 - Item 3 (Iteration 2.1)

Differences between Iteration 1.1 and 2.1

1. *Salience of relevant sentences.* In the pilot testing of iteration 1.1, of the 11 participants that did not provide a proof-by-contradiction for either question, 4 provided correct but insufficient answers, 4 participants provided at least 1 incorrect answer, and 3 participants were unable to answer either question. This suggests that the item was even more challenging than anticipated and that the scaffolding questions did not have the facilitating effect that they were intended to. In iteration 2.1, in order to provide further scaffolding, after each question hints were included to focus participants' attention on relevant sentences.

Test Item Bank for Task Type 2 - Item 3 (Iteration 2.2)

The Bank Robbers

You are Sherlock Holmes's assistant. You and he are trying to solve a mystery. Ms. Englund, Ms. Finn, and Ms. Lux are 3 international criminals that are planning a bank robbery somewhere in Europe. The police know that one of them is in England, one of them is in Finland, and one of them is in Luxembourg. They have asked Sherlock Holmes to find out which of the 3 women is in England. Sherlock has collected the following information:

1) Ms. Lux is in England.
2) Ms. Lux is not in Finland.
3) Ms. Englund is not in Finland.
4) Ms. Englund is not in Luxembourg.

However, Sherlock has just learned that **only 1 of these sentences is actually true. The other 3 sentences are false**. Unfortunately, no one has told him which sentence is the true one.

He studies the clues very carefully and then shouts, "Aha! Sentence 1 is false. The woman that is in England is definitely not Ms. Lux."

Question: How does Sherlock Holmes know that sentence 1 is false?
    (Think about the relationship between sentence 1 and 2.)

He studies the clues for a while longer and then says, "I see! The woman that is in England is definitely not Ms. Englund either."

Question: How does Sherlock Holmes know that Ms. Englund is not in England?
    (Hint: Think about the relationship between this question and sentences 3 & 4.)

Sherlock Holmes smiles. You realize that he has solved yet another case and that the woman in England must be Ms. Finn.

Test Item Bank for Task Type 2 - Item 3 (Iteration 2.2)

Differences between Iteration 2.1 and 2.2

1. *Significance of hints.* The hints that were added in iteration 2.1 were scrutinized, and it was decided that even if certain sentences are made more salient to participants, this may not be sufficient to get them to think about whether those sentences are logically consistent. In iteration 2.2, to provide further scaffolding, sentences of the form "Think about X and Y." were changed to "Think about *the relationship between* X and Y."

2. *Chronological organization of item.* The 2 questions were intended to elicit justification for the first 2 key deductions made by Sherlock. However, when the results of the pilot testing of iteration 1.1 were scrutinized more closely, evidence was discovered that at least one participant (participant 4) failed to realize how much information Sherlock Holmes was supposed to have access to:

"3a. Once he [Sherlock Holmes] figured out Ms. Finn was in England, and the only true statement was #3, he matched up the other two [women] with the other countries."

Participant 4 had used the fact that Ms. Finn was in England to demonstrate that Ms. Lux was not in England. However, Sherlock did the exact opposite; i.e. he used the fact that Ms. Lux was not in England as the first step in figuring out that Ms. Finn was in England. This strongly suggests that the point of the first question was not clear to participant 4. In iteration 2.2, to make the chronology of events clearer, questions were interspersed so that each question appears directly after the relevant deduction.

3. *Relationship between Sherlock's first deduction and statement 1.* Sherlock Holmes's first deduction is directly related to statement 1. However, in the pilot testing of iteration 1.1, when answering the first question, the majority of participants made no mention of statement 1. One explanation is that since Sherlock's first deduction and statement 1 have slightly different wording, it may not be obvious to some participants that they are related. In iteration 2.2, it was decided it would do no harm to make the relationship more obvious, so the following was added just before Sherlock's first deduction:

"Aha! Sentence 1 is false."

4. *Removal of question title.* In iteration 2.1, the title was stated as a question ("Where in the world are Ms. Englund, Ms. Finn, and Ms. Lux?"). This confused some participants, as they thought the purpose of the task was to answer that question. In iteration 2.2, the question title was removed in favor of a title which stated the topic of the puzzle.

5. *Bold-faced highlighting.* In iteration 2.2, words to be highlighted were not only underlined, but bold-faced as well. The motivation for this was based on feedback received about another item (See Item 2, Iteration 2.3).

Test Item Bank for Task Type 2 - **Item 3 (Pilot 2)**

Results of Pilot 2
Item elicited proof-by-contradiction from 14 out of 20 participants.

Of the 14 proof-by-contradictions elicited, 7 involved past-tense-only conditionals, and only all of 7 of the past-tense only conditionals were second conditionals.

There number of proof-by-contradictions elicited was encouraging. Also, the fact that *some* of these proof-by-contradictions involved second conditionals was also encouraging. However, the number of elicited past-tense-only conditionals was not sufficient to merit giving this item operational status.

In the written feedback provided after the test, 6 participants reported being confused by the similarity between the names of the women and the countries.

Test Item Bank for Task Type 2 - Item 3 (Iteration 3.1)

The Bank Robbers

You are Sherlock Holmes's assistant. You and he are trying to solve a mystery. Ms. Roberts, Ms. Stevens, and Ms. Thompson are 3 international criminals that are planning a bank robbery somewhere in Europe. The police know that one of them is in England, one of them is in Finland, and one of them is in Luxembourg. They have asked Sherlock Holmes to find out which of the 3 women is in England. Sherlock has collected the following information:

1) Ms. Thompson is in England.
2) Ms. Thompson is not in Finland.
3) Ms. Roberts is not in Finland.
4) Ms. Roberts is not in Luxembourg.

However, Sherlock has just learned that **only 1 of these sentences is actually true. The other 3 sentences are false**. Unfortunately, no one has told him which sentence is the true one.

He studies the clues very carefully and then shouts, "Aha! Sentence 1 is false. The woman that is in England is definitely not Ms. Thompson."

Question: How does Sherlock Holmes know that sentence 1 is false?
(Think about the relationship between sentence 1 and 2.)

He studies the clues for a while longer and then says, "I see! The woman that is in England is definitely not Ms. Roberts either."

Question: How does Sherlock Holmes know that Ms. Roberts is not in England?
(Hint: Think about the relationship between this question and sentences 3 & 4.)

Sherlock Holmes smiles. You realize that he has solved yet another case and that the woman in England must be Ms. Stevens.

Test Item Bank for Task Type 2 - Item 3 (Iteration 3.1)

Differences between Iteration 2.2 and 3.1

1. *Significance of hints.* In iteration 3.1, the women were given names that were not similar to the names of the countries.

Rationale: In Pilot 2 of the *Robbers* puzzle 6 participants reported being confused by the similarity between the names of women and of countries.

Test Item Bank for Task Type 2 - Item 4

Title
The Game Show

Status
Pending further development

Description
This puzzle involves two contestants who are appearing on a game show together. In the game they are playing, there are three doors. Behind one of the doors is a large sum of money. One of the players is provided with enough information to determine the correct door, but they must use deduction to figure it out.

This logic puzzle represents the first attempt to create an item from scratch, i.e. by using test specs rather than by adapting an existing puzzle.

This item's first pilot was done at the same time as the second pilot of items 1 through 3.

History of Iterations

1.1	Pilot 1

Test Item Bank for Task Type 2 - Item 4 (Iteration 1.1)

The Game Show

Definitions:
An *odd* number is a number like 1, 3, 5, 7, etc.
An *even* number is a number like 2, 4, 6, 8, etc.

You and your friend Larry are on a TV game show. You are teammates. The game show host takes you and Larry to a stage which has doors numbered 1 through 4 (see Diagram below).

The game show host says to you and Larry, "Behind one of these doors is $20,000, but behind the other doors are goats. Guess the door with the money behind it, and you can keep it. To help you, I'm going to give each of you a hint. After I give hints to both of you, one of you may guess which door is the correct one. However, after one of you has guessed, the other person may not guess.

The game show host continues, "Larry, I'll give you a hint first. **The correct door is next to door number…**"

Instead of saying the number, the game show host writes it on a small piece of paper and shows it to Larry. Unfortunately, **you cannot see the number that is written on Larry's piece of paper**.

Larry stares at his piece of paper for a few moments and then says, "Well, this information is helpful, but **I still don't know for certain which door has the money behind it.**"

Even though you cannot see the number on Larry's piece of paper, you think for a moment and realize that it must be a "2" or a "3."

Question: How do you know that Larry's piece of paper does not have a "1" or "4" on it?

Then, the game show host turns to you and says, "Now, here's your hint. The number of the door with the money behind it is…"

The game show host writes your hint on a piece of paper and shows it to you. It says, "…an odd number."

Based on this information, you answer, "The money is behind door #3."

The game show host opens door #3, and you and Larry are $20,000 richer.

Diagram – Four Doors

Test Item Bank for Task Type 2 - **Item 4 (Pilot 1)**

Results of Pilot 1
Item elicited proof-by-contradiction from 15 out of 20 participants.

Of the 15 proof-by-contradictions elicited, 11 involved past-tense-only conditionals, and only 9 involved second conditionals.

This item did not elicit as high a number of second conditionals as test item 1 did. However, the researcher was unable to isolate which task factors (if any) may have contributed to this difference.

This item is to be further developed, pending the identification of task factors which may contributed to the low occurrence of past-tense-only conditionals. It would probably be particularly beneficial to scrutinize the difference between this test item and the *Coins* puzzle.

Sub-specifications for Task Type 3

Posited Illocutionary act
To give or solicit advice

Status of Posited Illocutionary act
Pending development of task specifications

Overview
Tasks are oral role-plays involving 2 participants. One participant solicits advice. The other participant gives advice.

Examples of Target Language
E.g.,   I wouldn't do that if I were you.
What would you do if you were in my shoes?
(Note: Such counterfactual constructions are also *counter-identical*)

Specifications
Advice can be solicited / given with a wide variety of lexical forms. In order to narrow the range of possible lexical forms, tasks should be created which render it more likely that counterfactual forms (more specifically, counter-identical forms) are more likely to occur.

However, it is unclear at this time which contextual, situational, and interpersonal variables should be manipulated to achieve this, or indeed whether there are such variables. Therefore, before task specifications can be designed, it will be necessary to identify underlying patterns in the environments in which counter-identical forms occur.

References

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