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Comprehending Advice and Inducements: Evidence from Conditionals and Conjunctions

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Abstract

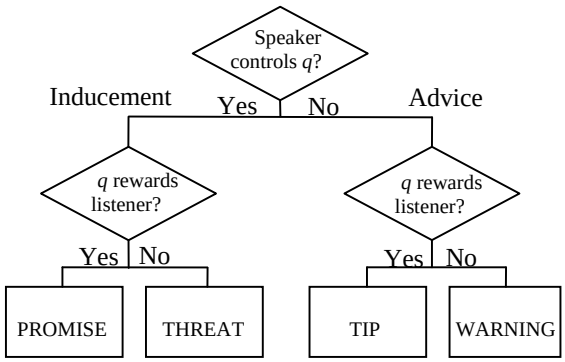
Conditionals of the form *if p then q* can implicitly convey a range of speech acts including promises, tips, threats and warnings. These are traditionally divided into the broader categories of advice (tips and warnings) and inducement (promises and threats). One consequence of this distinction is that speech acts from within the same category should be harder to differentiate than those from different categories. We examined this in three self-paced reading experiments. Experiment 1 revealed a rapid processing penalty when inducements (promises) and advice (tips) were anaphorically referenced using a mismatching speech act. In Experiment 2 a delayed penalty was observed when a speech act (promise or threat) was referenced by a mismatching speech act from the same category of inducements. However, when our conditional promises and threats were replaced with conjunctions in Experiment 3 (e.g., "wash my car AND I'll pay you £5") this effect was reversed, with a rapid reading time penalty as the mismatching anaphor was processed. These data suggest that speech acts from the same category are harder to discriminate than those from different categories, but only when communicated in the conditional form.

Keywords: Conditionals; Advice; Inducement; Promise; Threat; Tip

Introduction

Conditionals can implicitly convey a range of speech acts including promises (e.g., "if you wash the car, I'll pay you £5"), tips (e.g., "if you want to lose weight, you need to exercise more"), threats (e.g., "if you're late again, I'll fire you") and warnings (e.g., "if you travel to Thailand, beware of pickpockets"). These are traditionally divided into the broader categories of advice (tips and warnings) and inducements (promises and threats) (see Evans, 2005). Following this traditional distinction López-Rousseau and Ketelaar (2006) outlined a pragmatic cues algorithm for classifying conditional speech acts (see Figure 1). This algorithm suggests that conditionals can be classified broadly as advice or inducement using the single pragmatic cue of speaker control of the consequent event (q). To identify the specific speech act within each of these categories a second pragmatic cue is required. This cue concerns the utility of the consequent event for the addressee (i.e., positive or negative).

Figure 1: Pragmatic Cues Algorithm (López-Rousseau & Ketelaar, 2006)



So for example, the statement "if you wash the car, I'll pay you £5" uttered by a father to his son can be broadly classified as an inducement because the speaker has control of the consequent event (i.e., paying £5). This inducement can then be classified as a promise on the basis that the consequent event (i.e., recieving £5) has positive utility to the hearer (see also Bonnefon, 2009).

One consequence of the initial distinction between advice and inducement is that speech acts from within the same category should be harder to differentiate than those from different categories. In other words, speech acts within the same category (e.g., promises and threats) should be percieved as semantically and pragmatically 'closer' than those from different categories (e.g., promises and tips). In Experiment 1 we examined how easily readers could distinguish between speech acts that come from different categories. Specifically we looked at the processing of promises (inducement) and tips (advice).

Experiment 1

In the word-by-word self paced reading experiment below we presented participants with a number of implicit conditional speech acts (tips and promises) embedded in short vignettes. These speech acts were then anaphorically referenced using either a matching or mismatching speech act noun (e.g., 'this tip…' or 'this promise…'). If readers are sensitive to the broad distinction between advice and inducements during comprehension, then a slow down would be predicted when the referenced speech act mismatches the implied speech act (relative to when they match) e.g., reading times to the word 'promise' in the example below should be faster following an implied promise than an implied tip.

Example item

Chris was looking to a buy a new car. After spending all day in car dealerships he had decided to make an offer on a second hand Audi. The dealer had earlier said "if you buy the car, I'll give you 12 months free insurance." / The dealer had earlier said "if you buy the car, make sure you negotiate with the insurance company for the best deal." This was a useful *promise/tip* that could save him money. After half an hour of haggling they agreed a deal on the car.

Method

Design 2x2 (Implied Speech Act x Referenced Speech Act) repeated measures. Participants read conditionals embedded in short vignettes. Each conditional indirectly communicated either a promise or a tip. Following each conditional, a target sentence contained an anaphoric reference that named the implied speech act as either a 'tip' or a 'promise'. This reference either matched or mismatched the implied meaning of the preceding conditional, allowing us to compare reading times for identical regions of text across conditions.

Materials Participants read 32 vignettes identical in structure to the example above. There were four versions of each vignette with each implying either a tip or a promise which was then anaphorically referenced as either a 'tip' or 'promise'. Implied speech acts were pre-tested in a rating task to ensure that they communicated the intended speech act.

Participants Thirty two volunteers from the University of Manchester population. All participants were native English speakers and did not have a reading disability. They were each paid £5.

Procedure Participants were informed that they would be presented with a number of passages on a word-by-word basis. To advance through the passages, they pressed the space bar. Dashes were used to represent the rest of each passage. Only one word was visible at a time. Comprehension questions appeared on 25% of the trials. Participants first completed two practice trials.

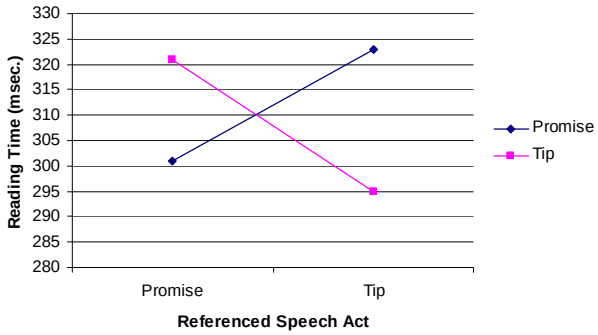
Results

Reading times were summed to form three analysis regions. Region 1 was simply the referenced speech act to capture any rapid inconsistency effects. Region 2 was the remainder of the sentence up to the penultimate word to capture any spill over effects. Region 3 was the final word of the sentence to capture any delayed sentence wrap up effects.

This was a useful /$_1$ promise/$_2$ that could save him/$_3$ money./

Region 1 There were no main effects of Implied Speech Act (both Fs < 1) or Referenced Speech Act (both Fs < 1). Crucially, the interaction between these variables was significant (F1(1, 31) = 4.31, MSE = 4,182, p = .046, ηp2 = .12; F2(1, 31) = 10.72, MSE = 1,681, p = .003, ηp2 = .26). This revealed a reading time penalty when the Referenced Speech Act mismatched the Implied Speech Act. Planned comparisons showed that this reading time penalty was symmetrical (i.e., approximately the same effect size for both referenced speech acts): a penalty of 20 msec. merged when the word 'promise' was inappropriately used to describe an implied tip (t1(31) = 1.86, p = .037, ηp2 = .10 t2(31) = 1.62, p = .058, ηp2 = .078), whereas the penalty was 28 msec. when the word 'tip' was inappropriately used to describe an implied promise (t1(31) = 1.57, p = .064, ηp2 = .07; t2(31) = 2.6, p = .007; ηp2 = .18).

Figure 2: Reading times (msec.) for Experiment 1, Region 1



Region 2 There were no main effects of Implied Speech Act (both Fs < 1) or Referenced Speech Act (F1 (1, 31) = 2.74, MSE = 39,970, p = .11, ηp2 = .08; F2 (1, 31) = 1.56, MSE = 69,763, p = .22, ηp2 = .05) and no interaction between these variables (F1 (1, 31) = 2.64, MSE = 31,417, p = .11, ηp2 = .08; F2 (1, 31) = 1.49, MSE = 55,668, p = .23, ηp2 = .05). Planned contrasts that sensitivity to the implied speech act carried over into this region following the inappropriate anaphoric use of the word 'tip' (penalty = 79 msec. t1(31) = 1.94, p = .031, ηp2 = .11; t2(31) = 1.37, p = .09, ηp2 = .06), but no such carryover effect appeared after inappropriate use of the word 'promise' (penalty = 22 msec. t1(31) = .37, p = .36, ηp2 = .004; t2(31) = .41, p = .34, ηp2 = .005).

Region 3 There were no main effects of Implied Speech Act ($F1(1, 31) = 1.86$, $MSE = 17{,}917$, $p = .183$, $\eta p2 = .06$; $F2(1, 31) = 1.29$, $MSE = 28{,}856$, $p = .265$, $\eta p2 = .04$), or Referenced Speech Act ($F1(1, 31) = 2.71$, $MSE = 7{,}782$, $p = .11$, $\eta p2 = .08$; $F2(1, 31) = 1.32$, $MSE = 15{,}983$, $p = .26$, $\eta p2 = .04$) and no interaction between these variables (both $Fs < 1$). Planned contrasts revealed no reading time penalty when the words 'promise' ($t1(31) = .91$, $p = .18$, $\eta p2 = .03$; $t2(31) = .989$, $p = .17$, $\eta p2 = .03$) and 'tip' ($t1(31) = 1.2$, $p = .12$, $\eta p2 = .045$; $t2(31) = .88$, $p = .19$, $\eta p2 = .02$) were inappropriately used as an anaphor.

Discussion

Analysis of reading times to the explicitly revealed speech act (Region 1) revealed a rapid interaction as a result of the Referenced Speech Act mismatching the Implied Speech Act. This effect was approximately symmetrical for both promises and tips (i.e., the word 'promise' was read 20 msec. faster following an implied promise than following an implied tip and the word 'tip' was read 28 msec. faster following an implied tip than an implied promise). Since tips and promises come from different speech act categories (advice and inducement respectively), the reading time slow down for mismatching anaphoric references provides initial evidence that readers are able to rapidly discriminate between these speech act categories during comprehension. In terms of the pragmatic cues algorithm, these data support the idea that readers are able to use the pragmatic cue of speaker control to rapidly discriminate between inducements and advice.

While our findings show that readers are rapidly sensitive to the distinction between inducements and advice, these categories mirror a common distinction in the reasoning literature between indicative and deontic reasoning. While conditional advice invites a form of indicative reasoning about possibilities, conditional inducements inherently require a form of deontic reasoning about permissions and obligations. Several offline deduction studies have noted differences in the way that people reason with indicative and deontic conditionals, with participants tending to draw more inferences (both valid and invalid) from inducement conditionals (Newstead et al., 1997). Given that our materials differed in the mode of reasoning required for comprehension, this contrast may have been reflected in our findings. Therefore, when a mismatching anaphor was processed, the processing penalty may have been caused by a mismatch at the level of the specific speech act (tip vs. promise), the more abstract level of the speech act category (advice vs. inducement), the mode of reasoning that was required (indicative vs. deontic) or any combination of the above.

In Experiment 2 we refined our investigation by examining whether readers represent specific speech acts during comprehension in the absence of any mismatch at the levels of speech act category and mode of reasoning. This was achieved by focusing on conditional promises and threats, which both come from the same speech act category (inducements) and communicate a deontic relationship between p and q.

Experiment 2

Experiment 1 revealed that readers are sensitive to the broad distinction between speech act categories. Experiment 2 is identical in design to Experiment 1 but focuses on readers' sensitivity to specific speech acts within the same category, by examining the processing of promises and threats (both of which are inducements). To differentiate speech acts at this level of representation both stages of the pragmatic cues algorithm must operate. The operation of these two stages may therefore be more cognitively demanding than differentiating between promises and tips (which required the operation of only the first stage). This motivates two competing predictions concerning the onset of any sensitivity. If readers are able to discriminate between speech acts within a speech act category as easily as they do for speech acts between categories, then a rapid sensitivity to a mismatching anaphor would be expected (as was found in Experiment 1). However, if conditionals from the same speech act category are pragmatically closer than those from different speech act categories (thus harder to discriminate), then that should involve an extra stage of processing. Any processing cost may then occur at a delay; i.e., downstream from the speech act noun itself. This would be consistent with discourse processing studies in which semantically close anomalies (i.e., information that is implausible rather than incongruent) cause a delayed processing penalty (e.g., Rayner, Warren, Juhasz, & Liversedge, 2004; Stewart, Pickering, & Sturt, 2004).

Method

Design The design was identical to Experiment 1, except that the two levels of each experimental factor were promises and threats rather than promises and tips.

Materials 32 items followed the same structure as Experiment 1.

Example Item

John was in a meeting with his project supervisor at university. They were discussing the results of the study for which John was employed as a Research Assistant. John's supervisor said to him "if the results are written by next week, then I will put you on the paper as an author." / John's supervisor said to him "if the results are written later than next week, then I'll take you off the project." John decided based upon this promise/threat that he would make sure the results were completed. He thought he would work on it over the weekend if necessary.

Participants 24 volunteers from the University of Manchester population.

Procedure The procedure was identical to Experiment 1.

Results

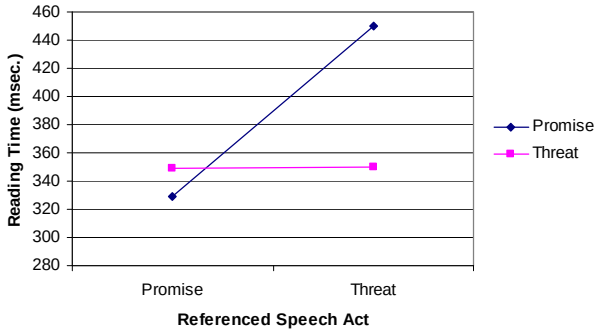
The three analysis regions were identical to Experiment 1.

Region 1 There were no main effects of Implied Speech Act (F1 (1, 23) = 1.51, MSE = 1,943, p = .23, ηp2 = .62; F2 < 1) or Referenced Speech Act (both Fs < 1) and no interaction between these variables (both Fs < 1). Planned contrasts revealed no reading time penalties when the words 'promise' (t1(23) = .34, p = .37, ηp2 = .005); t2(31) = .27, p = .40, ηp2 = .002) and 'threat' (t1(23) = .97, p = .17, ηp2 = .04; t2(31) = 1.0, p = .16, ηp2 = .03) were inappropriately used as anaphors.

Region 2 There were no main effects of Implied Speech Act (both Fs < 1) or Referenced Speech Act (both Fs < 1) and no interaction between these variables (F1 < 1; F2 (1, 31) = 2.56, MSE = 112,417, p = .12, ηp2 = .08). Planned contrasts revealed no reading time penalties immediately after the words 'promise' (t1(23) = .28, p = .39, ηp2 = .003; t2(31) = .7, p = .24, ηp2 = .02) and 'threat' (t1(23) = .69, p = .25, ηp2 = .02; t2(31) = 1.7, p = .05, ηp2 = .09) were inappropriately used as anaphors.

Region 3 Analysis of variance revealed a main effect of Implied Speech Act by items only (F1(1, 23) = 2.7, MSE = 14,372, p = .11, ηp2 = .11; F2(1, 31) = 4.21, MSE = 18,886 p = .05, ηp2 = .12) and a significant main effect of Referenced Speech Act (F1(1, 23) = 12.5, MSE = 7,309, p = .002, ηp2 = .35; F2(1, 31) = 4.92, MSE = 24,775, p = .03, ηp2 = .14). The interaction between Implied Speech Act and Referenced Speech Act was also significant (F1(1, 23) = 8.40, MSE = 10,268, p = .01, ηp2 = .27; F2(1, 31) = 6.09, MSE = 18,886, p = .02, ηp2 = .16) revealing a reading time penalty when the Referenced Speech Act mismatched the Implied Speech Act (relative to when the implied and revealed speech acts matched). Planned comparisons revealed that this penalty was asymmetric, with a significant slowdown of 100 msec. at the end of a sentence that inappropriately described a promise as a threat (t1(23) = 2.49, p = .011, ηp2 = .21; t2(31) = 2.72, p = .006, ηp2 = .19), but a non-significant penalty of 20 msec. when a threat was described as a promise (t1(23) = .950, p = .18, ηp2 = .04; t2(31) = -.81, p = .21; ηp2 = .02).

Figure 3: Reading times for Experiment 2, Region 3



Discussion

Analysis of the reading time data in Experiment 2 revealed that participants were not sensitive to the mismatch between conditional promises and threats until the end of the target sentence (Region 3). This delayed sensitivity suggests that during processing, speech acts from the same speech act category (inducements) take longer to discriminate following a mismatching anaphoric reference than speech acts from different categories (i.e., compared to the rapid penalty observed in Experiment 1). Since mode of reasoning, speech act category and paralinguistic factors including the social status of the protagonists were held constant across conditions, our findings can only be attributable to the within category difference. This is consistent with the idea that speech acts within the same category are pragmatically closer (and thus harder to discriminate) than speech acts from different categories.

Interestingly, our results also revealed that when the delayed sensitivity to a mismatching anaphor eventually arose, the pattern of results was asymmetrical. Specifically, there was no statistically significant processing penalty when an implied threat (e.g., "if the results are written later than next week, then I'll take you off the project") was anaphorically referenced as a promise (20 msec.). However, there was a large processing penalty (100 msec.) when an implied promise (e.g., "if the results are written by next week, then I will put you on the paper as an author") was referenced as a threat.

One explanation for this pattern of findings is that promises have a broader pragmatic scope than threats. Indeed, the common phrase "it's not a threat, it's a promise" emphasises how threats can be subsumed by promises. In this instance the speaker is using the perceived obligation associated with a promise (Searle & Vanderveken, 1985) to show that their threat is not hollow. Conversely, it would be unusual to for someone to assert "it's not a promise, it's a threat", as this makes the speech act pragmatically weaker by reducing the degree of obligation. Participants in Experiment 2 appear to have followed this distinction as they experienced a numerically large processing penalty when trying to interpret promises as threats.

Experiment 3

The early effect in Experiment 1 and the delayed effect in Experiment 2 show that conditionals from the same speech act category (i.e., promises and threats) are harder to discriminate than those from different categories (i.e., promises and tips). In terms of the pragmatic cues algorithm, this supports the idea that two stages of processing are required to identify a specific speech act. Experiment 3 sought to determine if this second stage of processing is unique to conditionals or whether it also occurs when the same speech acts are presented unconditionally.

Fillenbaum (1976) showed that conditional promises and threats can both be paraphrased using the conjunction AND. For example, the conditional threat 'if you do that, I'll shoot you' can be paraphrased as 'do that AND I'll shoot you', likewise the conditional promise 'if you wash my car, I'll pay you £5' and be paraphrased as 'wash my car AND I'll pay you £5'. Our Experiment 2 showed that conditional promises and threats take time to discriminate, with the onset of the inconsistency effect occurring at the end of the sentence. In Experiment 3 we used the same design as Experiment 2 but replaced our conditional promises and threats with paraphrased conjunctions (See Example below). Delayed inconsistency effects (akin to Experiment 2) would show that the delayed penalty found in Experiment 2 is not unique to conditionals; whereas an early effect would show that the delayed penalty in Experiment 2 is related specifically to the conditional form.

Example Item

John was in a meeting with his project supervisor at university. They were discussing the results of the study for which John was employed as a research assistant. John's supervisor said to him "Write the results by next week and I will put you on the paper as an author" / "Write the results later than next week and I'll take you off the project". John decided based upon this promise/threat that he would make sure the results were completed. He thought he would work on it over the weekend if necessary.

Method

Design The design was identical to Experiment 2, except that the two levels of each experimental factor were paraphrased promises and threats.

Materials 32 items were identical to Experiment 2 except that the conditional promises and threats were replaced with paraphrases.

Participants 24 volunteers from the University of Manchester population.

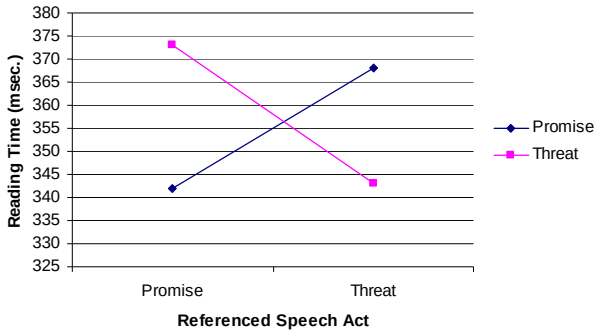
Procedure The procedure was identical to Experiments 1 and 2

Results

The three analysis regions were identical to Experiments 1 and 2.

Region 1 There were no main effects of Implied Speech Act or Revealed Speech Act (all Fs <1). However, the interaction of these variables was highly significant (F1 (1, 23) = 15.4, MSE = 1,170, p = <.001, ηp2 = .40; F2 (1, 23) = 5.6, MSE = 4,320, p = <.025, ηp2 = .15). Planned contrasts revealed a significant penalty of 30 msec. when promise was inappropriately used as an anaphor (t1(23) = 3.9, p = <.001; t2(31) = 1.8, p = .04) and a penalty of 24 msec. when threat was inappropriately used as an anaphor (t1(23) = 2.0, p = .03; t2(31) = 1.7, p = .05).

Figure 4: Reading times (msec.) for Experiment 3, Region 1



Region 2 There were no main effects (all Fs <1) and an interaction significant by items only (F1 <1; F2(1, 31) = 14.2, MSE = 72,367, p = <.001, ηp2 = .32). Planned contrasts revealed a penalty of 150 msec. significant by items only when promise was inappropriately used as an anaphor (t1(23) = .58, p = .28; t2(31) = 2.6, p = .01) and a penalty of 208 msec. significant by items only when threat was inappropriately used as an anaphor (t1(23) = .90, p = .18; t2(31) = 2.8, p = .004).

Region 3 There were no main effect of Implied Speech Act (both Fs <1) or Referenced Speech Act (F1= 1.3, MSE = 3,624, p = .26, ηp2 = .05;F2<1) and no interaction between these variables (F1= 2.6, MSE = 9,997, p = .12, ηp2 = .10; F2 = 1.2, MSE = 28,767, p = .28, ηp2 = .04)

Discussion

Readers were rapidly sensitive to the speech acts communicated by paraphrased promises and threats. These effects occurred at the earliest possible opportunity (Region 1). In contrast, the *conditional* promises and threats examined in Experiment 2 took much longer to discriminate with the onset of effects not occurring until Region 3. This suggests that the two stage algorithm proposed by López-Rousseau and Ketelaar (2006) only operates when information is presented in the conditional form.

General Discussion

Three experiments examined the interpretation of implied speech acts during comprehension. In Experiment 1 a rapid reading time penalty was observed when an inducement (promise) or advice (tip) conditional was anaphorically referenced as a speech act from a different category. In Experiment 2 a *delayed* penalty was observed when the mismatching anaphor was a speech act noun from the same category of conditionals (i.e., promises and threats). Experiment 3 examined non-conditional, paraphrased promises and threats. This revealed a rapid penalty when the anaphor mismatched the implied speech act.

In combination, these findings support a classification scheme that includes the broad speech act categories of inducement and advice. While conditional speech acts from different categories are rapidly perceived as mismatching, conditional speech acts from within the same category appear to be pragmatically closer and thus take longer to discriminate. Importantly, Experiment 3 shows that this classification scheme may be unique to conditionals as non conditional speech acts from the same category were rapidly perceived as mismatching.

In terms of the pragmatic cues algorithm, our processing data are consistent with the idea that conditionals from different categories (which can be discriminated using only one stage of the algorithm) are more pragmatically distinct than those from the same category (which require both stages to operate); whether the two stages of the algorithm operate sequentially or in parallel remains a question for future research. Our findings also revealed an important distinction *within* speech act categories. At present the second stage of the pragmatic cues algorithm distinguishes promise from threats based on the utility of the consequent for the listener. However, our data suggest that conditional promises are also perceived as having a broader pragmatic scope than threats. Participants experienced greater processing load when interpreting promises as threats than they did when interpreting threats as promises. Given that promises presuppose a greater degree of obligation than threats (Searle & Vanderveken, 1985) our findings suggest that threats may be perceived as pragmatically weaker than promises. Specifically, it appears that the act of promising can subsume the act of threatening to some extent, but threats cannot pragmatically subsume promises. Theories that rely on grouping statements under broad category labels must be able to account for such differences in interpretation within speech act categories.

From a discourse processing perspective, our findings show that conditional speech acts are used to inform comprehension. However, it is important to acknowledge that our findings do not necessarily imply the automatic activation of conditional speech acts as they are processed (c.f., Holtgraves, 2008). What they do show is that when a speech act noun anaphorically references an implied conditional speech act, readers are sensitive to the consistency of this anaphoric reference. At present, the precise processes leading to this sensitivity are unclear. For example, readers may not automatically activate the implied conditional speech act as it comprehended. Rather, they may defer interpretation and make a strategic backwards inference when the anaphoric reference is encountered. Determining whether the activation of conditional speech acts is automatic or strategic is an important question for future research.

Expanding upon research that has demonstrated the importance of pragmatics on how conditionals are ultimately interpreted, our results show that pragmatic function guides semantic interpretation during discourse processing, providing the first step towards understanding how people understand everyday conditionals in real time. This finding suggests that experimental paradigms that focus on incremental processing provide a useful avenue for the examination of factors that influence the interpretation of conditional statements. Such approaches allow for a broader cognitive perspective on conditionals.

Acknowledgments

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