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An eye-tracking investigation into readers' sensitivity to actual versus expected utility in the comprehension of conditionals.

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An eye-tracking investigation into readers' sensitivity to actual versus expected utility in

the comprehension of conditionals.

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Abstract

The successful comprehension of a utility conditional (i.e., an '*if p, then q*' statement

where *p* and/or *q* is valued by one or more agents) requires the construction of a mental

representation of the situation described by that conditional, and integration of this

representation with prior context. In an eye-tracking experiment, we examined the time

course of integrating conditional utility information into the broader discourse model.

Specifically, the experiment determined whether readers were sensitive, during rapid

heuristic processing, to the congruency between the utility of the consequent clause of a

conditional (positive or negative) and a reader's subjective expectations based on prior

context. On a number of eye-tracking measures we found that readers were sensitive to

conditional utility; conditionals for which the consequent utility mismatched that which

would be anticipated on the basis of prior context resulted in processing disruption.

Crucially, this sensitivity emerged on measures which are accepted to indicate early

processing within the language comprehension system, and suggests that the evaluation

of a conditional's utility informs the early stages of conditional processing.

Introduction

Conditionals of the form of the form *if p then q* are often asserted with the goal of influencing the behaviour of others (Evans, Neilens, Handley, & Over, 2008). A conditional promise (e.g., *if you help me fix my car, then I will buy you a beer*) is often uttered with the intent of *encouraging* a behaviour while a conditional threat (e.g., *if you scratch my car, I'll ground you*) is often uttered with the intent of *discouraging* a behaviour. These are two examples from a range of assertions that fall under the umbrella of *utility conditionals* (Bonnefon, 2009; Bonnefon, Haigh & Stewart, 2013). Broadly defined, utility conditionals are conditional statements with some degree of utility to one or more agents (e.g., the speaker, the hearer or someone else).

Bonnefon (2009) defines utility in terms of goal achievement, with an action that helps an agent to achieve a desired goal having positive utility for that agent (and vice versa for actions that hinder goal achievement). This descriptive approach to representing conditionals is largely unconcerned with speech act labels, but is nevertheless compatible with a narrower algorithmic approach specifically designed for classifying conditional promises, tips, threat and warnings (López-Roussseau & Ketelaar, 2004; 2006). This two-stage Pragmatic Cues Algorithm uses speaker control of the consequent event (control or no control) and the subjective utility of this event (positive or negative) as cues to discriminate between conditional promises, tips, threats and warnings with over 90% accuracy (see Figure 1).

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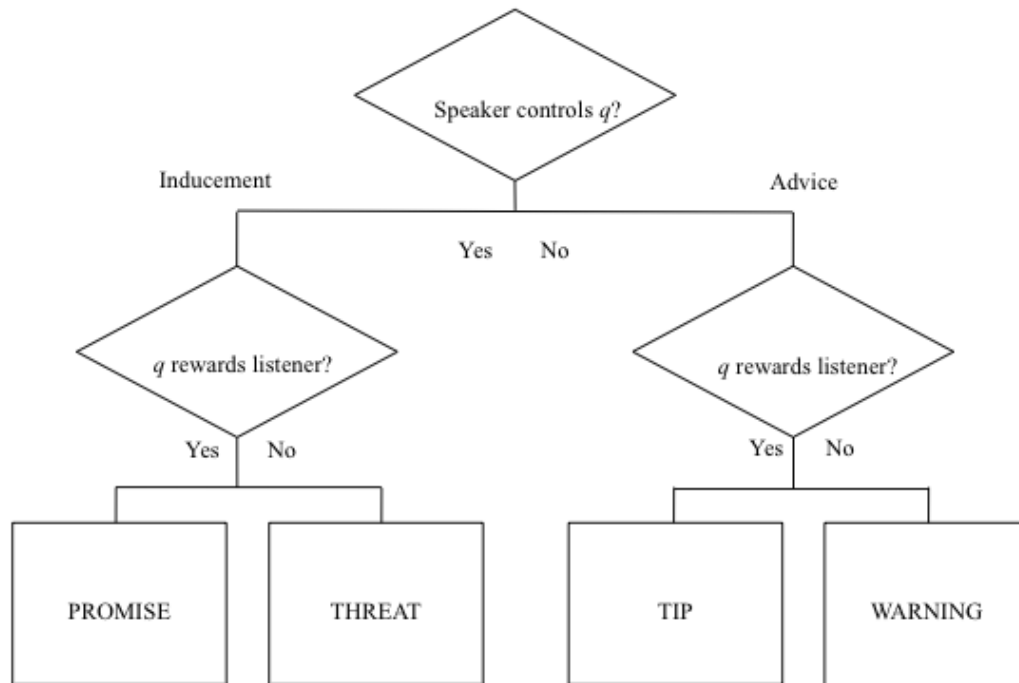
Figure 1: Pragmatic Cues Algorithm (López-Roussseau and Ketelaar, 2006).

While the theories above have been developed using data from tasks in which

participants are asked to consciously rate or classify conditionals, a more recent line of

research has sought to examine how conditionals are processed spontaneously during

incremental comprehension (Haigh, Stewart, Wood, & Connell, 2011; Ferguson &

Sanford, 2008; Nieuwland, 2013; Nieuwland & Martin, 2012; Stewart, Haigh, &

Ferguson, in press; Stewart, Haigh, & Kidd, 2009). The goal of this approach is to

identify the fast acting heuristics that guide the early stages of conditional processing.

Dual-processing accounts of cognition (e.g., Evans, 1989, 2003) provide a possible

theoretical framework in which the operation of these fast acting heuristics may be

conceptualised. These accounts distinguish between rapid, automatic heuristic

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processing, and slower, more effortful analytic processing (see Evans, 2008 for a detailed

review).

Following the Pragmatic Cues Algorithm (López-Roussseau & Ketelaar, 2004,

2006), two possible cues that may inform the processing of conditionals are those driven

by speaker control and utility. Speaker control and utility are central to this account and,

given their salience, are obvious candidates for rapidly informing the early heuristic

interpretation of a conditional speech act as it is comprehended. Indeed there is evidence

that both these cues can be used in the processing of conditional indirect meaning

downstream from the conditional itself (Haigh et al., 2011). Further evidence for the

importance of utility in the context of conditionals can be found in Evans et al. (2008).

They examined the circumstances under which conditionals can be asserted, and reported

that conditional utility is central for the assertability of a conditional promise.   In two

experiments they found that utility (alongside the conditional link from p to q) played a

key role in people's judgments of the persuasiveness of a particular conditional.

Together, the Pragmatic Cues Algorithm and the empirical findings reported above

suggest that utility is central to how conditionals are used and understood in everyday

situations; however, the question of *when* the influence of utility is manifested during

online conditional processing remains open.

There is evidence that the first cue in the Pragmatic Cues Algorithm, speaker

control, can influence the early stages of conditional processing. Stewart et al. (in press)

recorded eye movements as participants read conditional promises or tips embedded in

vignettes (e.g., 'if you submit your paper to the Journal of Physics, then I will publish it

in the next issue' / 'if you submit your paper to the Journal of Physics, then it stands a

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good chance of being published'). Prior context was manipulated so that the character

asserting the conditional either had perceived control of the consequent event (e.g., the

Journal's Editor) or no control of this event (e.g., a colleague). The eye movement record

revealed early disruption to processing occurring as the consequent clause was read when

a promise was uttered by a protagonist with no control over the consequent event.

In the experiment below, we examine whether perceived utility (the second

pragmatic cue in the Pragmatic Cues Algorithm) is also able to influence the early

processing of conditionals. Finding evidence that readers are sensitive online to

conditional utility (and the extent to which it (mis)matches information provided by prior

discourse) would be compatible with a view in which conditional utility plays a key role

in the fast-acting heuristics that operate during the early stages of conditional processing.

We can manipulate the degree to which consequent utility is congruent with a reader's

expectations by varying prior context to set up the likelihood that the subsequent

conditional utility will be positive or negative. In Example 1, below, the conditional

describes an event where the editor of a journal is either impressed or unimpressed by the

findings reported by the character "Alan". In the case where the editor is *impressed* by

Alan's findings (a1), this positive view will result in the anticipation of a subsequent

positive utility action by the Editor (i.e., an action that is likely to help Alan achieve his

goal of publishing the findings). However, for the case where the editor is *unimpressed*

by Alan's findings (a2), this will result in the expectation of negative utility for Alan. The

conditional statement uttered by the Editor then describes either a negative (b1) or a

positive (b2) action for the hearer, Alan. The degree to which the anticipated utility (as

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determined by prior context) and actual utility of the conditional match determines

whether the conditional is congruent with prior context.

Example 1:

Alan had just presented his research paper to a meeting of leading physicists. During the

coffee break he was called over by the Editor of the internationally renowned Journal of

Physics.

(a1) *The Editor was very impressed by Alan's findings and said that they should be*

widely publicised

(a2) *The Editor was very critical of Alan's findings and said that they were not valid.*

(b1) *As they parted, the Editor told Alan "if you submit your paper to the Journal of*

Physics, then I will reject it outright".

(b2) *As they parted, the Editor told Alan "if you submit your paper to the Journal of*

Physics, then I will accept it outright".

This comment made Alan consider his options carefully.

*Example adapted from Evans (2005).

It should be noted that in terms of language processing, finding a plausibility effect such

that descriptions of implausible events (i.e., sentences incongruent with prior context)

take longer to read than descriptions of plausible (i.e., congruent) events would not be

considered particularly noteworthy (see Rayner, Warren, Juhasz, & Liversedge, 2004).

However, it is important to emphasise that we are using such an effect here *diagnostically*

to explore how conditionals themselves are processed. Plausibility, in the case of our

conditionals, is determined by the degree of match between the utility associated with a

particular conditional and prior context (which varied due to a controlled polarity

manipulation of the protagonist's attitude). Any perceived implausibility is likely to be

based on real world knowledge about what might typically happen in a situation where

the Editor likes or dislikes a paper. Therefore, evidence of a plausibility effect on the

processing of conditionals that emerges rapidly would be supportive of a view of

conditional processing in which utility plays an important early (heuristic) role in how

conditionals are processed and understood.

In the experiment below we use eye-tracking during the comprehension of

conditionals to explore this question of time course. We use this technique because eye-

tracking can tell use *when* it is during the processing of conditionals that conditional

utility comes to exert an influence. Early effects of utility (e.g., occurring on first-pass

regressions out and regression path measures of the consequent clause) would be

indicative of this variable being involved in rapid heuristic processing, whereas delayed

effects (e.g., only on total reading time for the consequent clause or delayed effects

emerging only in subsequent regions of text) would indicate that that the consideration of

utility is associated with slower, more cognitively demanding analytic processes.

Experiment

In the experiment that follows we consider the Pragmatic Cues Algorithm (López-

Roussseau & Ketelaar, 2004, 2006) as a processing framework. If readers are sensitive to

the utility of the consequent clause of a conditional as the conditional is read, then there

should be a processing disruption for situations in which the consequent utility

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mismatches that which a reader would anticipate on the basis of prior context. Based on

previous evidence from eye-movement research (e.g., Braze, Shankweiler, Ni, &

Palumbo, 2002; Ni, Fodor, Crain & Shankweiler, 1998; Rayner, et al., 2004, Stewart,

Pickering, & Sturt, 2004), we expect this disruption to be exhibited as an early slow-

down in reading (e.g., on first-pass regressions out and regression path measures), with

an increased incidence of regressive eye movements during processing of the consequent

analysis region. In contrast, if initial processing of a conditional does not involve the

evaluation of consequent utility, then we could expect to find no sensitivity to utility

mismatches during early processing of a conditional itself, but rather an effect emerging

on measures of later processing (e.g., total reading times) or on measures associated with

a subsequent post critical region of text.

Method

Participants

Thirty six native English speakers from the University of Kent took part, in return for

course credit.

Design & Materials

Experimental items consisted of conditional statements embedded in fictional vignettes.

Prior context was manipulated to bias the *anticipated* utility of the subsequent conditional

to be either positive or negative. Additionally, the *actual* utility of the conditional

statement was manipulated to be either positive or negative. This resulted in a fully-

crossed 2 (Anticipated Utility) x 2 (Actual Utility) repeated measures design comparing

four conditions: (i) Anticipate Positive / Actual Positive; (ii) Anticipate Positive / Actual Negative; (iii) Anticipate Negative / Actual Positive; and (iv) Anticipate Negative / Actual Negative. Note that the conditional statement was lexically identical in conditions (i) and (iii) (where Actual Utility is Positive) and conditions (ii) and (iv) (where Actual Utility is Negative).

Thirty two experimental vignettes were constructed as in Table 1 below (see Appendix for full set of items). Each vignette was five sentences long. Sentence one introduced a protagonist (e.g., Alan). Sentence two introduced a character who would later assert the conditional statement (e.g., the Editor). Sentence three was manipulated so that it biased the anticipated utility of the subsequent conditional to be either positive or negative for the protagonist (e.g. '*The Editor was impressed/critical of Alan's findings…*'). Sentence four contained a conditional statement that was manipulated to be either positive or negative for the protagonist (e.g. '*…I will accept/reject the paper outright*'). Sentence five provided a neutral continuation for analysis of spillover effects, and was identical across all four conditions.

Table 1: Example item showing regions of analysis.

Anticipate Positive / Actual Positive
Alan had just presented his research paper to a meeting of leading physicists. During the coffee break he was called over by the Editor of the internationally renowned Journal of Physics. The Editor was very impressed by Alan's findings and said that they should be widely publicised. As they parted, the Editor told Alan |"if you submit your paper to the Journal of Physics, PRE-CRITICAL|then I will accept it outright". CRITICAL|This comment made Alan consider his options carefully. POST-CRITICAL|

Anticipate Positive / Actual Negative
Alan had just presented his research paper to a meeting of leading physicists. During the coffee break he was called over by the Editor of the internationally renowned Journal of

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Physics. The Editor was very impressed by Alan's findings and said that they should be widely publicised. As they parted, the Editor told Alan |"if you submit your paper to the Journal of Physics, ₚₑₑ-CRITICAL|then I will reject it outright". CRITICAL|This comment made Alan consider his options carefully. POST-CRITICAL|

Anticipate Negative / Actual Positive
Alan had just presented his research paper to a meeting of leading physicists. During the coffee break he was called over by the Editor of the internationally renowned Journal of Physics. The Editor was very critical of Alan's findings and said that they were not valid. As they parted, the Editor told Alan |"if you submit your paper to the Journal of Physics, PRE-CRITICAL|then I will accept it outright". CRITICAL|This comment made Alan consider his options carefully. POST-CRITICAL|

Anticipate Negative / Actual Negative
Alan had just presented his research paper to a meeting of leading physicists. During the coffee break he was called over by the Editor of the internationally renowned Journal of Physics. The Editor was very critical of Alan's findings and said that they were not valid. As they parted, the Editor told Alan |"if you submit your paper to the Journal of Physics, PRE-CRITICAL|then I will reject it outright". CRITICAL|This comment made Alan consider his options carefully. POST-CRITICAL|

The full set of experimental items were split into four Latin-square presentation lists, with each list containing 32 experimental items, eight in each of the four conditions. Experimental items in each list were interspersed randomly among 38 unrelated filler vignettes, with each participant seeing a different random order. Importantly, each participant only saw each target sentence once, in one of the four conditions. Nine participants were randomly assigned to read each list. Comprehension questions followed half of the experimental and half of the filler trials. Participants did not receive feedback for their responses to these questions and all scored at or above 90% accuracy.

Procedure

Eye movements were recorded using an Eyelink 1000 eye-tracker in the Desktop Mount configuration. Viewing was binocular and recordings of gaze location and movement

were sampled from the left eye at 1000 Hz. A chin and forehead rest was used to stabilise

the participants' head position. Vignettes were presented in size 14 Arial font on a CRT

monitor, 60 centimetres from the participants' eyes.

At the start of the experiment, the eye-tracker was calibrated and validated against

nine fixation points to establish the correlation between x/y voltages and screen position.

This procedure was repeated as necessary during the experiment. Participants were

instructed to read at their normal rate for comprehension. Before each trial the screen was

blank except for the presence of a gaze trigger, which was located at the top left of the

screen- where the first character of the text would be displayed. Participants' accurate

fixation on this gaze trigger automatically initiated the next trial presentation. After

reading each sentence, participants clicked a button on the mouse that either led to the

presentation of a comprehension question (after 50% of trials) or the next trial.

Results

Method of analysis

Reading patterns were analysed in three regions, as shown in Table 1. The critical

analysis region was the consequent clause of the conditional statement (e.g. 'then I will

accept/reject it outright'). This region was lexically identical for the two conditions that

described a positive actual utility, and the two conditions that described a negative actual

utility. We also analysed a pre-critical region (the antecedent clause) and a post-critical

region (sentence five), both of which were lexically identical across all four conditions.

An automatic procedure pooled fixations shorter than 80 msec. with adjacent

fixations, excluded fixations that were shorter than 40 msec. if they were not within three

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characters of another fixation and truncated fixations longer than 1200 msec. Trials in

which two or more adjacent regions had zero first-pass reading time were removed.

These trials accounted for less than 1% of the total data set.

We analysed five processing measures. The first three provide information about

early processing as a region of text is initially encountered (1-3) and the final two account

for later processes as a region of text is revisited (4-5). Table 2 displays mean values for

each measure in each condition and region. Figure 2 displays the mean first-pass

regressions out from the pre-critical, critical and post-critical regions, while Figure 3

displays the mean regression path reading times for the same analysis regions.

1. First-pass reading time is the sum of all the fixation durations (msec.) from first

entering the region until first exiting to the left or right.

2. First-pass regressions out is the percentage of trials in which regressive saccades were

made from the current most rightward fixation into an earlier region. This measure

indicates the degree to which left to right eye movements are disrupted while first reading

a region of text.

3. Regression path reading time is the sum of all fixation durations (msec.) from first

entering a region until first exiting the region to the right (including all regressions). This

is a measure of how long it takes reader to *go past* a region of text after first entering it.

4. Regressions in is the percentage of trials where one or more fixations in a region are

preceded by a fixation in a later region. This provides information about which regions of

text needed to be re-visited.

5. Total reading time is the sum of all fixation durations in a region (msec.).

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Table 2: Mean reading times and regressions to each region (standard errors in

parentheses).

Anticipated / Actual Utility	First-pass (msec.)	First-pass Regressions Out %	Regression Path (msec.)	Regressions In %	Total Time (msec.)
Pre-Critical Region					
Anticipated + / Actual +	546 (30)	14.5 (2.3)	757 (58)	19.2 (3.1)	732 (32)
Anticipated + / Actual −	580 (36)	12.9 (2.2)	796 (88)	38.1 (3.5)	985 (65)
Anticipated − / Actual +	572 (29)	11.6 (2.2)	675 (39)	38.3 (3.6)	937 (50)
Anticipated − / Actual −	547 (28)	15.3 (2.5)	758 (94)	23.8 (3.8)	757 (39)
Critical Region					
Anticipated + / Actual +	822 (47)	17.9 (3.0)	1087 (57)	13.5 (2.3)	1037 (44)
Anticipated + / Actual −	841 (44)	28.9 (3.2)	1502 (150)	21.9 (3.1)	1349 (78)
Anticipated − / Actual +	871 (41)	31.6 (3.6)	1611 (248)	23.3 (3.0)	1357 (64)
Anticipated − / Actual −	754 (41)	20.4 (3.9)	1012 (61)	14.3 (2.1)	952 (49)
Post-Critical Region					
Anticipated + / Actual +	1644 (73)	42.4 (4.1)	2430 (139)	n/a	1922 (90)
Anticipated + / Actual −	1497 (89)	55.1 (4.5)	3626 (271)	n/a	2122 (115)
Anticipated − / Actual +	1670 (94)	54.7 (4.4)	3248 (246)	n/a	2156 (122)
Anticipated − / Actual −	1729 (77)	43.1 (5.1)	2630 (178)	n/a	1989 (87)

Analysis of the eye movement data in each region was performed using 2 x 2

(Anticipated Utility x Actual Utility) repeated measures ANOVAs, with subjects (F_1) and

items (F_2) as random factors.

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Pre-critical Region

On first-pass reading times, the ANOVA revealed no significant main effects for Anticipated Utility (*Fs* < 1) nor Actual Utility (*Fs* < 1) and no significant interaction between these variables (F_1(1, 35) = 2.67, *p* = .112, η_p^2 = .07; F_2(1, 31) = 1.94, *p* = .17, η_p^2 = .06).

The ANOVA on first-pass regressions out revealed no significant main effects of Anticipated Utility (*Fs* < 1) or Actual Utility (*Fs* < 1) and no significant interaction between these variables (F_1(1, 35) = 1.52, *p* = .23, η_p^2 = .04; F_2(1, 31) = 1.79, *p* = .19, η_p^2 = .06).

On regression path reading times, the ANOVA revealed no main effects of Anticipated Utility (F_1(1, 35) = 1.04, *p* = .31, η_p^2 = .029; F_2(1, 31) = 1.29, *p* = .26, η_p^2 = .04) or Actual Utility (F_1(1, 35) = 1.03, *p* = .32, η_p^2 = .029; F_2 < 1) and no interaction between these variables (*Fs* < 1).

On regressions in, the ANOVA revealed no main effects of Anticipated or Actual Utility (*Fs* < 1). However the interaction between these variables was significant (F_1(1, 35) = 32.85, *p* < .001, η_p^2 = .48; F_2(1, 31) = 35.39, *p* < .001, η_p^2 = .53). Pairwise comparisons revealed that there were fewer regressions into this region for positive utility conditionals when readers anticipated positive utility than when they anticipated negative utility (t_1(35) = 4.61, *p* < .001; t_2(31) = 4.93, *p* < .001). For negative utility conditionals there were fewer Regressions In when readers anticipated negative utility than when they anticipated positive utility (t_1(35) = 3.88, *p* < .001; t_2(31) = 3.97, *p* < .001).

On total reading times, the ANOVA revealed no main effects of Anticipated Utility (*Fs* < 1) or Actual Utility (F_1(1, 35) = 1.59, *p* = .22, η_p^2 = .04; F_2(1, 31) = 1.33, *p*

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$= .26$, $\eta_p^2 = .04$) . However, the interaction between these variables was significant (F_1(1, 35) = 32.79, $p < .001$, $\eta_p^2 = .48$; F_2(1, 31) = 28.45, $p < .001$, $\eta_p^2 = .48$). Pairwise comparisons revealed the total time spent reading positive utility conditionals was shorter when the context anticipated a positive utility than when it anticipated a negative utility (t_1(35) = 4.54, $p < .001$; t_2(31) = 4.30, $p < .001$). In contrast, for negative utility conditionals, total reading times were shorter when the preceding context anticipated a negative utility than when it anticipated a positive utility (t_1(35) = 5.17, $p < .001$; t_2(31) = 3.73, $p = .001$.

Critical Region

On first-pass reading times, the ANOVA revealed no main effects of Anticipated Utility (Fs < 1) or Actual Utility (F_1(1, 35) = 3.91, $p = .056$, $\eta_p^2 = .10$; F_2(1, 31) = 1.29, $p = .27$, $\eta_p^2 = .04$). However, the interaction between Anticipated and Actual utility variables was significant by subjects and marginal by items (F_1(1, 35) = 4.95, $p = .03$, $\eta_p^2 = .12$; F_2(1, 31) = 3.71, $p = .06$, $\eta_p^2 = .11$). Pairwise comparisons were non-significant, but indicated a numerical trend, whereby first-pass reading times for positive utility conditionals were faster when readers anticipated positive utility than when they anticipated negative utility (t_1(35) = 1.18, $p = .25$; t_2(31) = 0.95, $p = .35$). In contrast, for negative utility conditionals, first-pass reading times were faster when readers anticipated negative utility than when they anticipated positive utility (t_1(35) = 1.85, $p = .07$; t_2(31) = 1.99, $p = .06$).

The ANOVA on first-pass regressions out revealed there were no main effects of Anticipated Utility (F_1 < 1; F_2(1, 31) = 1.13, $p = .30$, $\eta_p^2 = .04$) or Actual Utility (Fs < 1). However, the interaction between these variables was significant (F_1(1, 35) = 13.76, $p =$

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.001, $\eta_p^2 = .28$; $F_2(1, 31) = 25.79$, $p < .001$, $\eta_p^2 = .45$). Pairwise comparisons revealed that there were fewer first-pass regressions out for positive utility conditionals when readers anticipated positive utility than when they anticipated negative utility ($t_1(35) = 3.55$, $p = .001$; $t_2(31) = 4.28$, $p < .001$). For negative utility conditionals there were fewer first-pass regressions out when readers anticipated negative utility than when they anticipated positive utility ($t_1(35) = 2.01$, $p = .052$; $t_2(31) = 2.15$, $p = .039$).

On regression path reading times, the ANOVA revealed no main effects of Anticipated or Actual Utility ($Fs < 1$); however the interaction between these variables was significant ($F_1(1, 35) = 15.06$, $p < .001$, $\eta_p^2 = .30$; $F_2(1, 31) = 23.37$, $p < .001$, $\eta_p^2 = .43$). Pairwise comparisons revealed that regression path reading times for positive utility conditionals were faster when readers anticipated positive utility than when they anticipated negative utility ($t_1(35) = 2.32$, $p = .026$; $t_2(31) = 3.62$, $p = .001$). For negative utility conditionals regression path reading times were faster when readers anticipated negative utility than when they anticipated positive utility ($t_1(35) = 4.16$, $p < .001$; $t_2(31) = 3.76$, $p = .001$).

On regressions in, ANOVA revealed no significant main effects of anticipated or actual utility ($Fs < 1$). However the interaction between these variables was significant ($F_1(1, 35) = 16.81$, $p < .001$, $\eta_p^2 = .32$; $F_2(1, 31) = 12.25$, $p = .001$, $\eta_p^2 = .28$). Pairwise comparisons revealed that there were fewer regressions into this region for positive utility conditionals when readers anticipated positive utility than when they anticipated negative utility ($t_1(35) = 2.79$, $p = .009$; $t_2(31) = 2.74$, $p = .01$). For negative utility conditionals there were fewer Regressions In when readers anticipated negative utility than when they anticipated positive utility ($t_1(35) = 3.06$, $p = .004$; $t_2(31) = 2.27$, $p = .03$).

On total reading times, the ANOVA revealed no main effects of Anticipated Utility ($F_1(1, 35) = 1.33$, $p = .26$, $\eta_p^2 = .04$; $F_2 < 1$) or Actual Utility ($F_1(1, 35) = 2.60$, $p = .12$, $\eta_p^2 = .07$; $F_2 < 1$). However, the interaction between these variables was significant ($F_1(1, 35) = 66.98$, $p < .001$, $\eta_p^2 = .66$; $F_2(1, 31) = 88.23$, $p < .001$, $\eta_p^2 = .74$). Pairwise comparisons in these regions revealed that the total time spent reading positive utility conditionals was shorter when the context anticipated a positive utility than when it anticipated a negative utility ($t_1(35) = 6.56$, $p < .001$; $t_2(31) = 5.12$, $p < .001$). In contrast, for negative utility conditionals, total reading times were shorter when the preceding context anticipated a negative utility than when it anticipated a positive utility ($t_1(35) = 6.52$, $p < .001$; $t_2(31) = 5.45$, $p < .001$).

Post-critical region

On first-pass reading times, the ANOVA showed a main effect of Anticipated Utility that was significant by subjects and marginal by items ($F_1(1, 35) = 5.70$, $p = .02$, $\eta_p^2 = .14$; $F_2(1, 31) = 3.91$, $p = .06$, $\eta_p^2 = .11$). First-pass reading times were longer when the context anticipated a negative utility, compared to when it anticipated a positive utility. There was no significant main effect of Actual Utility ($Fs < 1$). The interaction between these two variables was significant by subjects only ($F_1(1, 35) = 4.59$, $p = .039$, $\eta_p^2 = .12$; $F_2(1, 31) = 3.35$, $p = .08$, $\eta_p^2 = .10$). First-pass reading times on negative utility conditionals were faster when readers anticipated negative utility than when they anticipated positive utility ($t_1(35) = 3.14$, $p = .003$; $t_2(31) = 2.84$, $p = .008$), but there was no difference in reading times between the two positive utility conditionals ($t_1(36) = 0.36$, p = .23; $t_2(31) = 0.29$, p =.77).

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The ANOVA on first-pass regressions out revealed no significant main effects of Anticipated Utility or Actual Utility ($Fs < 1$), but a significant interaction between these variables ($F_1(1, 35) = 18.21$, $p < .001$, $\eta_p^2 = .34$; $F_2(1, 31) = 16.96$, $p < .001$, $\eta_p^2 = .35$). Pairwise comparisons showed that there were fewer first-pass regressions out for positive utility conditionals when readers anticipated positive utility than when they anticipated negative utility ($t_1(35) = 3.00$, $p = .005$; $t_2(31) = 2.70$, $p = .01$). For negative utility conditionals there were fewer first-pass regressions out when readers anticipated negative utility than when they anticipated positive utility ($t_1(35) = 3.28$, $p = .002$; $t_2(31) = 2.96$, $p = .006$).

On regression path reading times, the ANOVA revealed no main effect of Anticipated Utility ($Fs < 1$), a main effect of Actual Utility that was significant by participants only ($F_1(1, 35) = 7.98$, $p = .008$, $\eta_p^2 = .19$; $F_2(1, 31) = 3.49$, $p = .071$, $\eta_p^2 = .11$) and an interaction between these two variables ($F_1(1, 35) = 22.52$, $p < .001$, $\eta_p^2 = .39$; $F_2(1, 31) = 32.36$, $p < .001$, $\eta_p^2 = .51$). Pairwise comparisons revealed the same pattern of effects as in the critical region with faster regression path reading times for positive utility conditionals when readers anticipated positive utility than when they anticipated negative utility ($t_1(35) = 3.61$, $p = .001$; $t_2(31) = 4.52$, $p < .001$). For negative utility conditionals Regression Path times were faster when readers anticipated negative utility than when they anticipated positive utility ($t_1(35) = 4.40$, $p < .001$; $t_2(31) = 3.93$, $p < .001$).

On total reading times, the ANOVA revealed no main effects of Anticipated or Actual Utility ($Fs < 1$). However, there was an interaction between these variables ($F_1(1, 35) = 11.85$, $p = .002$, $\eta_p^2 = .25$; $F_2(1, 31) = 10.83$, $p = .002$, $\eta_p^2 = .26$). Pairwise

comparisons revealed shorter total reading times in this region for positive utility

conditionals when the context anticipated positive utility than when it anticipated

negative utility ($t_1(35) = 2.72$, $p = .01$; $t_2(31) = 2.93$, $p = .006$). For negative utility

conditionals, there was a trend for faster reading times when the context anticipated

negative utility compared to when it anticipated positive utility, but this difference did not

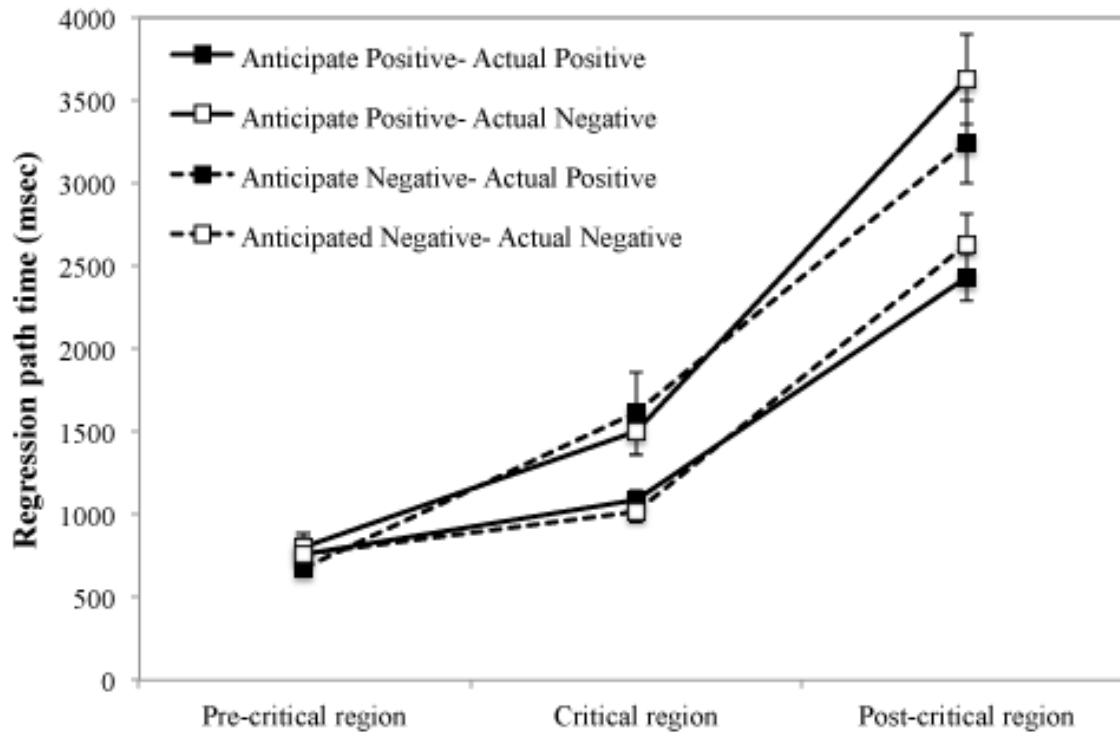reach significance here ($t_1(35) = 1.83$, $p = .075$; $t_2(31) = 1.77$, $p = .086$).

Figure 2: Mean first-pass regressions out from the pre-critical, critical and post-critical

regions. Error bars show standard errors.
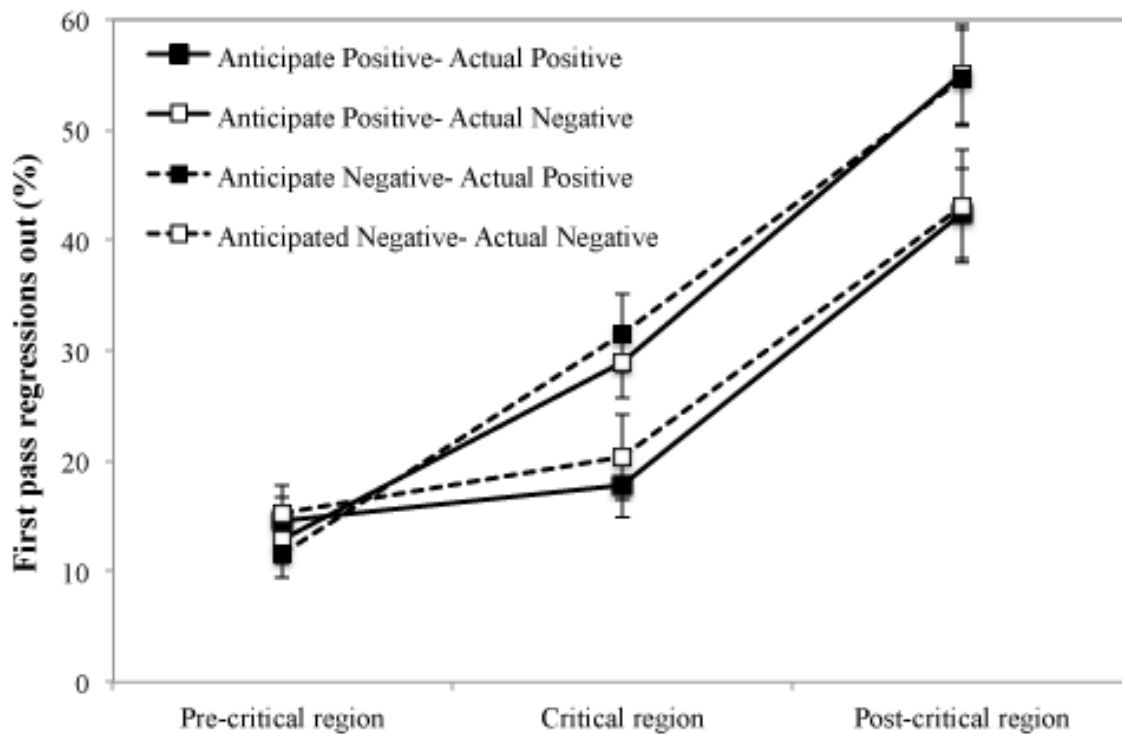
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Figure 3: Mean regression path reading times for the pre-critical, critical and post-critical

regions. Error bars show standard errors.

Discussion

Our goal in this experiment was to determine at what point during comprehension readers

are sensitive to the utility associated with conditional statements; critically we wanted to

determine whether utility exerted its influence during rapid, heuristic driven processing or

during later, delayed analytic processing. We did this by examining eye movements as

participants read utility conditionals that either matched or mismatched the utility

anticipated by prior context. There was some suggestion of sensitivity in readers to

whether anticipated and actual utilities matched in the first pass reading time analysis for

the critical region. As first-pass reading times are widely accepted to index early

processing, this pattern would suggest that the utility associated with a conditional begins

to be evaluated relatively quickly during interpretation. Furthermore this effect (indicated by the interaction between anticipated and actual utility) was statistically robust in the critical region on measures of first-pass regressions out, regressions in, regression path and total reading times. First-pass regressions out and regression path times also reflect early processing so together these results can be seen as converging evidence in support of the view that conditional utility has a rapid influence on incremental processing (in line with the heuristic view). In the first-pass regressions out, the regressions in, the regression path and total reading times analyses, processing disruption (i.e., an increase in reading times or an increase in regressions) arose when there was a mismatch between the anticipated and actual utilities associated with the critical region of the conditional. Virtually identical effects were also found for the analyses associated with the post-critical region (apart from on the regressions in measure which does not apply for the final region of text). The persistence of this pattern of effects indicates a general (and long-lasting) disruption to interpretation when the utility of the conditional and a reader's expectations about likely utility mismatch. This is compatible with the view that utility rapidly influences heuristic-level processing, but also has a sustained influence on subsequent processing. It should be noted that while we can conclude that our data support the view that utility informs processing *rapidly*, we are not making the stronger claim that our data show that utility informs processing *immediately*. Our critical analysis region was several words long so it may be the case that within this region (even though it was short) it might have been the case that utility information came to inform processing towards the region's conclusion.

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The Pragmatic Cues Algorithm (López-Roussseau & Ketelaar, 2004, 2006) was originally developed to allow for the classification of conditional speech acts that varied along the dimensions of speaker control and reward (i.e., utility). Utility is also central to Bonnefon's account of conditionals (Bonnefon, 2009) and plays a key role in the persuasiveness of conditionals (Evans et al., 2008). On the basis of the eye-tracking data we report it appears that utility plays an important early role in how conditionals are comprehended online. It could be argued that this relates to the extent of the salience associated with conditional utility. As Evans et al. found, utility plays a particularly important role in terms of how persuasive a conditional is seen as being. Given the importance of utility then in terms of trying to encourage/discourage someone's behaviour, it seems natural then to think that utility should be a source of information that is relatively easy to recover from the input when a conditional is encountered.

Bonnefon's (2009) framework, in its current form, captures utility as being simply positive, negative or neutral. As Bonnefon himself notes (p. 902), there are undoubtedly differences in utility magnitude present in conditionals when applied to real world situations. For instance, the consequent utility of the conditional *If I win the competition, then I will receive one million pounds* is higher than the consequent utility for the conditional *If I win the competition, then I will receive one thousand pounds* (although both utilities are positive). Understanding whether these magnitude differences are captured during online processing is a potential additional line of future investigation.

In addition to evidence that readers are sensitive online to the presuppositions that are communicated by conditionals describing counterfactual events (Stewart et al., 2009), to the implicit speech acts communicated by conditionals (Haigh et al., 2011) and to the

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extent to which a speaker has control over the consequent event in a conditional promise

(Stewart et al., in press) the research reported above demonstrates that readers are *also*

sensitive to key information related to the utility associated with conditionals. The

evidence presented here demonstrates that this utility information plays a rapid role in the

comprehension of conditional utterances; this is compatible with utility informing fast-

acting heuristic-level conditional processing. Together, these findings suggest that the

successful comprehension of conditionals describing hypothetical situations requires

readers to engage in sophisticated analysis involving utility and that they are able to do so

online, on a moment-by-moment basis.

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Acknowledgements

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References

Bonnefon, J-F. (2009). A theory of utility conditionals: paralogical reasoning from

decision-theoretic leakage. *Psychological Review, 116,* 888-907.

Bonnefon, J.-F., Haigh, M., & Stewart, A.J. (2013). Utility templates for the

interpretation of conditional statements. *Journal of Memory and Language, 68,* 350-

361.

Braze, D., Shankweiler, D., Ni, W., & Palumbo, L.C. (2002). Readers' eye movements

distinguish anomalies of form and content. *Journal of Psycholinguistic Research,*

31, 25-44.

Evans, J. St. B.T. (1989). *Bias in Human Reasoning: Causes and Consequences.*

Brighton, UK: Erlbaum.

Evans, J. St. B. T. (2003). In two minds: dual process accounts of reasoning. *Trends in*

Cognitive Science, 7, 454–59

Evans, J. St. B. T. (2005). The social and communicative function of conditional

statements. *Mind & Society, 4*, 97-113.

Evans, J. St. B. T. (2008). Dual-processing accounts of reasoning. *Annual Review of*

Psychology, 59, 255–278.

Evans, J. St. B. T., Neilens, H., Handley, S.J., & Over, D.E. (2008). When can we say

'if'? *Cognition, 108,* 100-116.

Ferguson H.J. & Sanford A.J. (2008). Anomalies in real and counterfactual worlds: an

eye-movement investigation. *Journal of Memory and Language, 58,* 609-626.

REPRESENTING CONDITIONAL UTILITY   27

Haigh, M., Stewart, A.J., Wood, J., & Connell, L. (2011). Conditional advice and

  inducements: are readers sensitive to implicit speech acts during comprehension?

  Acta Psychologica, 136, 419-424.

Lopez-Rousseau, A., & Ketelaar, T. (2004). "If . . .": Satisficing algorithms for mapping

  conditional statements onto social domains. *European Journal of Cognitive*

  Psychology, 16, 807–823.

Lopez-Rousseau, A., & Ketelaar, T. (2006). Juliet: If they do see thee, they will murder

  thee: a satisficing algorithm for pragmatic conditionals. *Mind & Society, 5,* 71–77.

Ni, W., Fodor, J.D., Crain, S., & Shankweiler, D.P. (1998). Anomalous strings: eye

  movement patterns. *Journal of Psycholinguistic Research, 27,* 515-539.

Nieuwland, M. S. (2013). "If a lion could speak . . . ": Online sensitivity to propositional

  truth-value of unrealistic counterfactual sentences. *Journal of Memory and*

  Language, 68, 54–67.

Nieuwland, M.S., & Martin, A.E. (2012). If the real world were irrelevant, so to speak:

  the role of propositional truth-value in counterfactual sentence comprehension.

  Cognition, 122, 102-109.

Rayner, K., Warren, T., Juhasz, B., & Liversedge, S. (2004). The effects of plausibility

  on eye movements in reading. *Journal of Experimental Psychology: Learning,*

  Memory and Cognition, 30, 1290-1301.

Stewart, A. J., Haigh, M., & Ferguson, H. J. (in press). Sensitivity to speaker control in

  the online comprehension of conditional tips and promises: an eye-tracking study.

  Journal of Experimental Psychology: Learning, Memory, and Cognition. doi:

  10.1037/a0031513

REPRESENTING CONDITIONAL UTILITY 28

Stewart, A.J., Haigh, M., & Kidd, E. (2009). An investigation into the online processing of counterfactual and indicative conditionals. *Quarterly Journal of Experimental Psychology, 62,* 2113-2125.

Stewart, A.J., Pickering, M.J., & Sturt, P. (2004). Using eye movements during reading as an implicit measure of the acceptability of brand extensions. *Applied Cognitive Psychology, 18,* 697-709.

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Appendix

Experimental items. Note that for each of the items below, conditions are listed in the order: Anticipate Positive/ Actual Positive, Anticipate Positive/ Actual Negative, Anticipate Negative/ Actual Positive, and Anticipate Negative / Actual Negative.

1.
Alan had just presented his research paper to a meeting of leading physicists. During the coffee break he was called over by the Editor of the internationally renowned Journal of Physics. The Editor was very impressed by Alan's findings and said that they should be widely publicised. As they parted, the Editor told Alan "if you submit your paper to the Journal of Physics, then I will accept it outright". This comment made Alan consider his options carefully.

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2.
Scott loved dance music and was desperate to go to the opening night of an exclusive new club in town. He had recently chatted to the owner of the club at a networking event organised through work. The owner seemed to really like Scott and admired his passion for dance music. As they parted, the owner told Scott "If you go to the opening night, I'll make sure you're on the guest list". This comment meant Scott could make plans for the weekend.

Scott loved dance music and was desperate to go to the opening night of an exclusive new club in town. He had recently chatted to the owner of the club at a networking event

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organised through work. The owner seemed to really like Scott and admired his passion for dance music. As they parted, the owner told Scott "If you go to the opening night, I'll have you thrown out". This comment meant Scott could make plans for the weekend.

Scott loved dance music and was desperate to go to the opening night of an exclusive new club in town. He had recently chatted to the owner of the club at a networking event organised through work. The owner took an instant dislike to Scott and was annoyed by his constant questions. As they parted, the owner told Scott "If you go to the opening night, I'll make sure you're on the guest list". This comment meant Scott could make plans for the weekend.

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3.
Laura was thinking of applying for a job as secretary at a high profile law firm. She phoned her former manager to ask if he could provide a reference. Fortunately, Laura had always got on well with her former manager and left on good terms. He told her "if you apply for the job, I'll write you a glowing reference". The deadline for applications was approaching soon.

Laura was thinking of applying for a job as secretary at a high profile law firm. She phoned her former manager to ask if he could provide a reference. Fortunately, Laura had always got on well with her former manager and left on good terms. He told her "if you apply for the job, I'll write you a terrible reference". The deadline for applications was approaching soon.

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4.
Steve had recently split up with his girlfriend. After not seeing each other for over two months they crossed paths as she was waiting for a bus. They had ended their relationship

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on good terms and always promised to stay in touch. After a few awkward moments her bus arrived and she muttered "if we cross paths again, I'll take you for lunch to catch up". Meeting his ex girlfriend again stirred up mixed emotions for Steve.

Steve had recently split up with his girlfriend. After not seeing each other for over two months they crossed paths as she was waiting for a bus. They had ended their relationship on good terms and always promised to stay in touch. After a few awkward moments her bus arrived and she muttered "if we cross paths again, I'll completely ignore you". Meeting his ex girlfriend again stirred up mixed emotions for Steve.

Steve had recently split up with his girlfriend. After not seeing each other for over two months they crossed paths as she was waiting for a bus. They had ended their relationship on bad terms and both felt very bitter. After a few awkward moments her bus arrived and she muttered "if we cross paths again, I'll take you for lunch to catch up". Meeting his ex girlfriend again stirred up mixed emotions for Steve.

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5.
Olivia was planning a house party and had issued an open invitation on Facebook. Her workmate Colin had replied to say he would probably be coming. Olivia was good friends with Colin and was pleased that he could make it. She messaged him back and said "if you come to my party, I'll make sure you are very welcome". Using Facebook made arranging parties much easier.

Olivia was planning a house party and had issued an open invitation on Facebook. Her workmate Colin had replied to say he would probably be coming. Olivia was good friends with Colin and was pleased that he could make it. She messaged him back and said "if you come to my party, I'll ask you to leave my house". Using Facebook made arranging parties much easier.

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6.

Dave had just finished university and had move back in with his mum. He was torn between looking for jobs and following his dream to go travelling for a year. His mum thought travelling was a great idea that would give him some useful life experience. She said to him "if you go travelling, I'll pay for your flights". With this in mind Dave made his decision.

Dave had just finished university and had move back in with his mum. He was torn between looking for jobs and following his dream to go travelling for a year. His mum thought travelling was a great idea that would give him some useful life experience. She said to him "if you go travelling, I'll kick you out for good". With this in mind Dave made his decision.

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7.

Hannah woke up feeling unwell and didn't know if she would make it into university for her lecture. She emailed her lecturer to let him know in advance that she might not be attending. Her lecturer was a very easy going and understanding man who wanted the best for his students. In his reply he said "if you miss the lecture, I'll happily send you the notes". Hannah hoped to make the lecture, but it was out of her hands.

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8.

Ian had been invited to a party, but had to stay at home to keep his teenage brother out of trouble. His brother suggested that they should both go to the party. Ian had a good relationship with his brother and thought he'd fit in fine. Ian told his brother "if you come to the party with me, I'll introduce you to all my friends". This solution wasn't ideal but it ensured that Ian could attend.

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9.

Graham was getting ready to go out to the pub to meet his mates. He asked his girlfriend to come, but she was planning to stay in and have an early night. She was pleased that Graham went out with his friends regularly and didn't mind him coming home drunk. She told him "if you get drunk, I'll cook you a big breakfast". It was meant to be quiet night out with the boys, but these gatherings often turned into wild nights out.

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Graham was getting ready to go out to the pub to meet his mates. He asked his girlfriend to come, but she was planning to stay in and have an early night. She disliked Graham's

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friends and hated him coming home drunk. She told him "if you get drunk, I'll cook you a big breakfast". It was meant to be quiet night out with the boys, but these gatherings often turned into wild nights out.

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10.

Julio was a top Premier League footballer, who loved to attend big celebrity events. He had recently been invited to an exclusive charity ball to raise money for the local hospital. His club manager was all in favour of his players contributing to the community in this way. He told Julio "if you go to the charity ball, I'll pick you for the next game". Following this comment, Julio made up his mind and phoned the organisers of the event.

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11.

Brian lived in a leafy suburb of Manchester and loved spending time out in the garden. However, his neighbour had an enormous tree that blocked out most of the sunlight. His neighbour was a friendly young lady who had wanted the tree cutting down ever since she moved in. When they discussed the issue she told Brian "if you cut down my tree, I'll give you a helping hand". The summer was approaching and he was keen to get his problem sorted out.

Brian lived in a leafy suburb of Manchester and loved spending time out in the garden. However, his neighbour had an enormous tree that blocked out most of the sunlight. His neighbour was a friendly young lady who had wanted the tree cutting down ever since

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she moved in. When they discussed the issue she told Brian "if you cut down my tree, I'll take you to court". The summer was approaching and he was keen to get his problem sorted out.

Brian lived in a leafy suburb of Manchester and loved spending time out in the garden. However, his neighbour had an enormous tree that blocked out most of the sunlight. His neighbour was an argumentative female lawyer who was adamant that the tree should stay standing. When they discussed the issue she told Brian "if you cut down my tree, I'll give you a helping hand". The summer was approaching and he was keen to get his problem sorted out.

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12.
Colin had always wanted to buy a sports car ever since he was a child. He didn't have any savings and thought about taking out a loan to buy himself the car of his dreams. His wife also dreamed of owning a sports car and saw it as a good investment. She said to him "if you buy a sports car, then I'll pay half the cost". He leafed through a classic car magazine while he considered his options.

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13.
Peter was a very popular high school student who was unsure whether or not to put himself forward for the position of Head Boy. After class one day his teacher, Mr Jones

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asked him stay behind for a chat. Mr Jones was keen to encourage Peter to nominate himself for Head Boy. He told Peter "if you nominate yourself, I'll give you an A* grade in the next exam". This comment helped Peter to make up his mind.

Peter was a very popular high school student who was unsure whether or not to put himself forward for the position of Head Boy. After class one day his teacher, Mr Jones asked him stay behind for a chat. Mr Jones was keen to encourage Peter to nominate himself for Head Boy. He told Peter "if you nominate yourself, I'll give you an F grade in the next exam". This comment helped Peter to make up his mind.

Peter was a very popular high school student who was unsure whether or not to put himself forward for the position of Head Boy. After class one day his teacher, Mr Jones, asked him stay behind for a chat. Mr Jones was keen to discourage Peter from nominating himself for Head Boy. He told Peter "if you nominate yourself, I'll give you an A* grade in the next exam". This comment helped Peter to make up his mind.

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14.
Andrew was planning a holiday for holiday for him and his girlfriend. He'd always had his heart sent on visiting Siberia and really wanted to book the flights there and then. His girlfriend thought Siberia would be fascinating and exciting holiday destination and was keen to visit. She said to him "if you book flights to Siberia, I would love to come". Andrew decided to sleep on the idea before making any decisions.

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15.

Adam and Josh were young brothers on holiday with their parents. When they arrived they found that they would be sharing a bunk bed. Adam hated heights and really wanted to sleep on the bottom bunk. He said to Josh "if you take the top bunk, I'll do anything for you". The pair of them were constantly in negotiation about things like this.

Adam and Josh were young brothers on holiday with their parents. When they arrived they found that they would be sharing a bunk bed. Adam hated heights and really wanted to sleep on the bottom bunk. He said to Josh "if you take the top bunk, I'll hit you really hard". The pair of them were constantly in negotiation about things like this.

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16.

Eleanor and Dave had been happily together for over five years. Recently however, they had run into a few problems with their relationship. Eleanor was desperate to talk to Dave about their problems. Dave had sent her a text message to see if you could phone her, she replied by saying "if you phone me, I'll talk to you about our problems". Both of them were feeling uncertain about the future.

Eleanor and Dave had been happily together for over five years. Recently however, they had run into a few problems with their relationship. Eleanor was desperate to talk to Dave about their problems. Dave had sent her a text message to see if you could phone her, she replied by saying "if you phone me, I won't talk about our problems". Both of them were feeling uncertain about the future.

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17.

Kelly was organising a night out with her friends. Earlier that day she had received a text message from her colleague Alex, asking if he could come along. Kelly really liked Alex and was keen for him to come. She replied by saying "if you come, I'll buy you a drink". She felt like she'd spent most of the day replying to text messages.

Kelly was organising a night out with her friends. Earlier that day she had received a text message from her colleague Alex, asking if he could come along. Kelly really liked Alex and was keen for him to come. She replied by saying "if you come, I'll ignore you". She felt like she'd spent most of the day replying to text messages.

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18.

Last night Perry and Liam borrowed their dad's car without asking. Unfortunately Perry managed to reverse the car into a garden wall and crack the rear bumper. Liam felt they were equally to blame for the accident and was willing to face the consequences. He said to Perry "if you tell dad, then I'll take equal responsibility". They always seemed to find themselves in trouble with their parents.

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19.
Graham was an enthusiastic psychology student who was hoping to be awarded funding to carry out a research study over the summer break. To get the funding he had to convince the head of the psychology department. Fortunately, Graham knew the head of the department well and had a good relationship with him. The head of the department had already told Graham "if you apply for funding, I'll ensure your application is accepted". This funding was his only opportunity to do paid research.

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20.
Bob was a massive Manchester City supporter. After much thought he decided he would go to City's big European away match in Rome. Luckily, his wife also loved Manchester City and was all for the idea. She told him "if you go to the football, then I'll come with you." Bob knew this might be his last chance to see City play in Europe.

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21.

Melissa is in her final year of Sixth Form and is unsure about whether she should apply for a place at university. She has previously discussed this with her father. He was in strongly in favour of her going to university and thought it was a good investment. He told her "if you go to university, I'll pay all of your fees". Melissa hated making big decisions like this.

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22.

Chloe and Adam rent an apartment together in the centre of town. After a particularly wild party last weekend the bathroom window had been cracked. Since the party was a joint idea Chloe was happy to take equal responsibility for the damage. She told Adam "if you phone the landlord, tell him that I'll take equal responsibility". The repair was likely to cost over a hundred pounds.

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23.
Kelly was auditioning to be part of a high profile televised signing contest. She had to two chances to sing to the judges. After her first song the judges thought she performed brilliantly and had real star potential. The lead judge told her "if you sing like that again, I'll put you through to the next round". Kelly knew that her second song was the final chance to impress.

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24.
Gina was desperate to speak to her boss but he had taken the day off sick. She didn't want to hassle him when he was ill, and so sent him an email asking if she could call him. He was a real workaholic and often took calls even when he was ill. He replied by saying "if you phone me at home, I'll talk to you now". It always made things more difficult when he was away from the office.

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25.
Sally and Rob were a young couple who were short of money. To make some extra cash Sarah decided to sell some of their possessions on eBay. Rob was happy with this and idea and suggested that she sell his old mountain bike. He said "if you sell my bike, I'll share the money with you". They were both starting to feel the effects of the credit crunch.

Sally and Rob were a young couple who were short of money. To make some extra cash Sarah decided to sell some of their possessions on eBay. Rob was happy with this and idea and suggested that she sell his old mountain bike. He said "if you sell my bike, I'll never forgive you". They were both starting to feel the effects of the credit crunch.

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26.
Theresa was an elderly lady who lived on her own. She had just answered the door to a sales person. Theresa quite liked sales people coming around as it was an opportunity for a chat. She told the sales person "if you come back again, I'll invite you in for a cup of tea". She seemed to have sales people on her door step every day.

Theresa was an elderly lady who lived on her own. She had just answered the door to a sales person. Theresa quite liked sales people coming around as it was an opportunity for a chat. She told the sales person "if you come back again, I'll report you to the council". She seemed to have sales people on her door step every day.

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27.
Tony worked in a large office on the outskirts of Manchester. He'd recently heard that the company was thinking or relocating the office to Switzerland for tax reasons. Tony was all in favour of moving to Switzerland as he had nothing keeping him in Manchester He told his boss "if the office is relocated, I'll definitely stay with the company". Tony always knew the company might move abroad at some point.

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28.
Wayne was a top Premier League footballer. However, his team were performing poorly with many fans wanting the manager to be sacked. Wayne fully supported the manager and was adamant that he should not be sacked. In a conversation with the club's owner, Wayne said "if you keep the manager, I'll stay at the club". Wayne knew he had a lot of influence over the club's owner.

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Wayne was a top Premier League footballer. However, his team were performing poorly with many fans wanting the manager to be sacked. Wayne blamed the team's poor performance on the manager and thought it was time for a change. In a conversation with the club's owner, Wayne said "if you keep the manager, I'll stay at the club". Wayne knew he had a lot of influence over the club's owner.

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29.
Carol was preparing to host a dinner party for two of her work colleagues. While she was cooking she sent her husband to the shop to buy some wine. Carol was a wine lover and often splashed out on expensive vintage wines. She had told her husband "if you get expensive wine, I'll give you the money for it". Dinner parties were a regular part of Carol's social life.

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Adam was planning to cook steak for some of his friends. He had earlier mentioned the idea to his housemate, Carly. Carly loved steak and thought it was a great idea. She told him "if you cook steak, I'll give you a helping hand". Dinner parties were a regular event at the house.

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Adam was planning to cook steak for some of his friends. He had earlier mentioned the idea to his housemate, Carly. Carly loved steak and thought it was a great idea. She told him "if you cook steak, I'll go out for the evening". Dinner parties were a regular event at the house.

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31.
Simon was a massive lover of kebabs. He told his colleague Matthew that he might go to the kebab shop for lunch. Matthew also loved kebabs and ate them at least twice a week. He said to Simon "if you go to the kebab shop, get me a chicken donner". Following this exchange, Simon put on his coat and headed for the door.

Simon was a massive lover of kebabs. He told his colleague Matthew that he might go to the kebab shop for lunch. Matthew also loved kebabs and ate them at least twice a week. He said to Simon "if you go to the kebab shop, I'll go elsewhere". Following this exchange, Simon put on his coat and headed for the door.

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32.
Deborah worked as a secretary in a busy office. She had been unsettled in her job and decided to talk to her manager about leaving the company. Her manager was looking for people to volunteer for redundancy and was happy to let her. He told her "if you decide to leave, I'll write you a good reference". Jobs were hard to come by but Deborah was willing to take her chances.

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