

This is an Accepted Manuscript of an article published by Taylor & Francis Group in *Discourse Processes*,

available online: <http://www.tandfonline.com/10.1080/0163853X.2017.1330046>

Comprehension of indirect requests is influenced by their degree of imposition

Andrew J. Stewart¹

Elizabeth Le-luan¹

Jeffrey S. Wood¹

Bo Yao¹

Matthew Haigh²

¹Division of Neuroscience and Experimental Psychology, University of Manchester, UK

²Department of Psychology, Northumbria University, UK

Address for correspondence:

Andrew J. Stewart,

Division of Neuroscience and Experimental Psychology,

University of Manchester,

Manchester, M13 9PL,

United Kingdom.

Tel: +44 (0)161 275 7331

andrew.stewart@manchester.ac.uk

Abstract

In everyday conversation, much communication is achieved using indirect language. This is particularly true when we utter requests. The decision to use indirect language is influenced by a number of factors including deniability, politeness, and the degree of imposition on the receiver of a request. In this paper we report the results of an eye-tracking experiment examining the influence on reading of the degree of imposition of a request. We manipulate whether context describes a situation in which the level of imposition on the receiver of the request is high (which thus motivates the use of indirect language) with one in which the level of imposition is low (and thus does not motivate the use of indirect language). We compare the comprehension of statements that are phrased indirectly with the comprehension of statements that are phrased more directly. We find that statements phrased indirectly are read more quickly in contexts where the level of imposition on the receiver is high versus when the level of imposition is low. In contrast, we find the processing of statements phrased directly does not vary as a function of level of imposition. This indicates that readers use pragmatic knowledge to guide interpretation of indirect requests. Our data provide an insight into the interface between pragmatic and semantic processing.

Key Words: experimental pragmatics, Gricean maxims, indirect language, eye tracking.

Introduction

Successful language comprehension involves the integration of linguistic input with a reader's knowledge and experience of the world (e.g., Garrod & Sanford, 1994; Sanford & Emmott, 2012; Sanford & Garrod, 1981, 1998). Part of this knowledge involves the interpersonal social considerations that influence the manner in which people communicate with each other. In everyday social situations, much communication is achieved indirectly (Pinker, Nowak & Lee, 2008). For example, after giving a presentation you might ask a colleague "What did you think of my presentation?" If the colleague provides an answer such as "It's hard to give a good presentation." it would suggest they are communicating an indirect meaning (i.e., that they didn't think much of the presentation). The fact they did not provide a direct answer to the question (thus violating the Gricean maxim of *relevance*) triggers a search for a hidden or indirect meaning (Holtgraves, 1998). In addition to replies, requests can be framed indirectly too. For example, in the context of a speeding motorist being stopped by a traffic cop, the motorist uttering "Perhaps there is another way we can resolve this" is likely to be interpreted as the motorist offering a bribe (see Lee & Pinker, 2010).

Indirect meaning is ubiquitous in social interaction but, remarkably, there has been very little research in the psychology of language processing into the factors involved in how such indirect language is understood. The lack of research on the topic is surprising given the wide use of indirect meaning in everyday communication. Indeed, the psycholinguistic research that has previously examined hidden or non-literal meaning has tended to do so from a very particular perspective in terms of conventionalized indirect requests, idioms, metaphors, and metonymy that are largely context *independent*. By contrast, the indirect statements that we

will examine are entirely context *dependent*, and thus require the reader to be sensitive to contextual factors and rules governing socially expected behaviours.

According to Holtgraves (1998) replies are recognised as communicating indirect meaning when they involve a violation of Grice's relevance maxim (Grice, 1975). In other words, when someone answers a question with an (apparently) irrelevant reply, this relevance violation acts as a signal that a hidden meaning is being communicated. The violation of another Gricean maxim (that of *manner*) seems to be at play in the context of other types of indirect language. The utterance "Perhaps there is another way we can resolve this" means little out of context, but can easily be interpreted as someone offering a bribe in the context of that person being in a position to offer a bribe to another. Despite the inherent ambiguity in language that is phrased indirectly, people often prefer to use language in this way rather than in a more direct and unambiguous manner. Indeed, returning to the traffic cop example, a possible more direct equivalent of "Perhaps there is another way we can resolve this" such as "I'll give you £20 and you could let me go" sounds unnatural. Given the potential increase in ambiguity as language becomes more indirect, there must be an equivalent (or greater) benefit that is *gained* from using indirect over direct language.

One key factor that is central to Politeness Theory (Brown & Levinson, 1987) proposes that interlocutors have a desire to maintain "face" (Goffman, 1967). Face or the "public self-image" is maintained through the use of the listener and speaker engaging in "face-work" to manage any occurrence of a face-threatening act. According to Politeness Theory, one way in which face can be threatened is by the degree of imposition associated with a particular request made by a speaker; note we are using the word "imposition" in the sense in which it used in Brown and Levinson's work, rather than in the more everyday sense. According to Brown and Levinson, imposition is closely related to the autonomy of the recipient of a

request. One way a request with a high level of imposition can come about is when both speaker and recipient know that the recipient is likely to respond favourably to the request. This is face-threatening to the recipient as this high level of imposition results in a reduction of their autonomy. According to Politeness Theory, this reduction in autonomy (and threat to the recipient's face) can be managed by the speaker framing the request indirectly.

A number of studies have investigated the circumstances under which readers are sensitive to the use of face-work and the role of indirect language in face management. Using off-line methods such as rating tasks (e.g., "How polite is this?") and production tasks (e.g., "What would you say in this context?"), research has offered strong support that the degree of imposition on the receiver of a request influences the decision to frame the request indirectly (e.g., Brown & Gilman, 1989; Holtgraves & Yang, 1992; Leichthy & Applegate, 1991). As the level of perceived imposition rises, so too does the perceived politeness of the associated request (Brown & Gilman, 1989; Holtgraves & Yang, 1992). When imposition is high, participants favour the use of indirect language to frame the request. Given that language almost always occurs in a social context, it is perhaps surprising that the influence of politeness and face-management factors on how language is comprehended (and produced) has not received more research attention in the language processing literature. Indeed, Holtgraves (2005) and Brown (1990) highlight the research potential for both social and cognitive psychology in the development of a better understanding of the relationship between language usage and the interpersonal social world. The focus of the experiment below is on how the degree of imposition of a request influences the comprehension of statements that are phrased indirectly.

Experiment

Of the limited research into indirect language of the type we are interested in, previous studies have utilised off-line questionnaires (Lim & Bowers, 1991), rating tasks (Clark & Schunk, 1980; Holtgraves & Yang, 1990), or decision tasks (Holtgraves & Yang, 1992) to measure how statements that are phrased indirectly are understood. In the experiment below we address a gap in the literature through examining readers' sensitivity to indirect statements by looking at how people process indirect and more direct statements (e.g., indirect: "Perhaps there is another way we can resolve this", direct: "I'll give you £20 and you could let me go"). We use eye-tracking during reading and manipulate how the degree of imposition of a request influences the processing of subsequent language that varies in its directness (see Example 1).

Example 1

Doug was speeding in his car and was stopped by a traffic cop. Traffic cops in this area were known to be dishonest/honest. Doug said "Perhaps there is another way we can resolve this."/ "Doug said "I'll give you £20 and you could let me go." The cop accepted the bribe and Doug avoided the penalty. Doug was on his way to visit his grandmother.

When context describes the traffic cops in a particular area as being *dishonest*, this results in a high probability of success of the bribe, and thus a high level of imposition on the recipient; both parties know that the cop will likely accept the bribe. Conversely, when context describes the traffic cops in a particular area as being *honest*, this results in a low probability of success of the bribe, and thus a low level of imposition on the recipient; they are under no obligation to accept the bribe (and both parties know this). According to Politeness Theory, requests involving a high degree of imposition are more likely to involve indirect language.

The utterance “Perhaps there is another way we can resolve this” should therefore be processed straightforwardly where a possible indirect meaning is supported by context. In contrast, the same utterance should cause processing difficulty when context does not offer up an obvious indirect meaning. A request that is made more directly (e.g., “I’ll give you £20 and you could let me go”) should be relatively easy to process regardless of context; its meaning is direct and thus less influenced by pragmatics-level factors. Our question of interest is *when* such information is available to influence the processing of statements that are phrased indirectly. Do such cues influence processing of indirect language as soon as it is encountered, or is their influence delayed? Given that pragmatics-driven processing is needed to understand the meaning being communicated by statements phrased indirectly, but less so by statements phrased directly, we might expect a differential effect of context on the processing of indirect versus direct language. Alternatively, it may be the case that the meaning of indirectly phrased statements is represented in an underspecified manner (Sanford & Sturt, 2002), in which case we would expect processing of indirect language to proceed the same regardless of context.

Pre-Test

Prior to the eye-tracking experiment we conducted a pre-test to ensure that the statements involving indirect language did not have a conventionalized meaning and so required context to be correctly understood. Twenty-six participants were presented with the 28 indirect statements in and out of context. Participants were asked to rate on a 7-point Likert scale the extent to which the meaning of each statement phrased indirectly was similar to the more directly phrased counterpart. A score towards 7 meant that the meanings of the indirect and

direct statements were seen as more similar, while a score towards 1 meant that their meaning were seen as less similar. A by-items analysis found that the statements involving indirect language were rated as having a more similar meaning as the direct counterpart when they were presented in context than when they were presented out of context ($M = 5.91$, $S.E. = 0.10$ when the indirect statements were presented in context *vs.* $M = 4.59$, $S.E. = 0.18$ when the indirect statements were presented out of context, $t(27) = 8.77$, $p < .001$, $d = 1.76$). This indicates that context is necessary for the statements involving indirect and direct language to be seen as similar. This is important in order to ensure that any effects observed in the eye-tracking study below could not be due to conventionalized knowledge of the indirect statements influencing their comprehension.

Method

Participants

Sixty native English speakers were recruited on an opportunistic basis. Participants had normal or corrected vision and no known reading impairment. Participants were compensated either monetarily or with course credits.

Design and Materials

The experiment included two independent variables each with two levels, Statement Phrasing (Indirect *vs.* Direct) and Degree of Imposition (High *vs.* Low). There were 28 vignettes that each appeared with four versions (see Table 1 for an example)¹. These 112 vignettes were then allocated to participants using a repeated measures Latin squared design. Each list

¹ The full set of materials is available upon request from the corresponding author.

contained 28 experimental, 14 filler, and 2 practice items. Each list was seen by 15 participants.

The experimental vignettes all followed the same structure. Sentence one introduced the main character (speaker). Sentence two manipulated the Degree of Imposition (High *vs.* Low) of the speaker's subsequent request on the recipient. This was the *imposition* region of analysis. Sentence three manipulated the statement phrasing (Indirect *vs.* Direct). The quoted statement in this region was the *critical* region of analysis. The fourth sentence indicated the acceptance of the request by the recipient. This was the *post-critical* region of analysis. The final sentence captured any wrap-up effects. Information in this sentence was not related to the request. The first, fourth, and final sentence were lexically identical across conditions.

Table 1: Example of the four experimental conditions. The analysis regions are delimited by vertical bars.

Statement Phrasing	Degree of Imposition	Vignette
Indirect	High	Doug was speeding in his car and was stopped by a traffic cop. Traffic cops in this area were known to be dishonest. IMPOSITION Doug said “Perhaps there is another way we can resolve this”. CRITICAL The cop accepted the bribe and Doug avoided the penalty. POST-CRITICAL Doug was on his way to visit his grandmother.
Indirect	Low	Doug was speeding in his car and was stopped by a traffic cop. Traffic cops in this area were known to be honest. IMPOSITION Doug said “Perhaps there is another way we can resolve this”. CRITICAL The cop accepted the bribe and Doug avoided the penalty. POST-CRITICAL Doug was on his way to visit his grandmother.
Direct	High	Doug was speeding in his car and was stopped by a traffic cop. Traffic cops in this area were known to be dishonest. IMPOSITION Doug said “I’ll give you £20 and you could let me go”. CRITICAL The cop accepted the bribe and Doug avoided the penalty. POST-CRITICAL Doug was on his way to visit his grandmother.
Direct	Low	Doug was speeding in his car and was stopped by a traffic cop. Traffic cops in this area were known to be honest. IMPOSITION Doug said “I’ll give you £20 and you could let me go”. CRITICAL The cop accepted the bribe and Doug avoided the penalty. POST-CRITICAL Doug was on his way to visit his grandmother.

Procedure

Participants were instructed to read silently to themselves for the sole purpose of comprehension. They were instructed to read at their normal rate. They were informed that comprehension questions would follow some but not all of the vignettes. The participants’ eye movements were recorded using an Eyelink 1000 in the desktop mount configuration. Reading was binocular, however, only the right eye was sampled. A chin rest and forehead

mount stabilized the head. The items were presented on a desktop monitor, in size 22 Arial font, and 60cm from the participant's eye.

The eyetracker was calibrated at the beginning of the session using 9 fixation points. This was repeated as necessary to ensure accuracy of fixation throughout the entirety of the experiment. Each trial began with a blank screen except for the presence of a gaze trigger, which was located towards the top left corner of the monitor. A fixation on this triggered the vignette to appear in full. The participant pressed a button on a controller to indicate they understood the vignette and were ready to move onto the next trial. Participants first completed two practice trials both followed by comprehension questions to ensure the instructions given were understood. Comprehension questions followed a third of the trials to maintain attention.

Results

Analysis of effects in the Imposition, Critical and Post-Critical regions was performed in *R* (R Development Core Team, 2015) using linear mixed models (Baayen, Davidson, & Bates, 2008) on the First Pass, Regression Path and Total Time reading measures. Logit mixed models were used to investigate the binomial First Pass Regressions Out (FPRO), and Regressions In measures (following Jaeger, 2008). Statement Phrasing, Degree of Imposition, and the interaction between them were used as fixed factors in the analysis, with participants and items as crossed random factors. Maximal random effects structures were used where possible: random intercepts for participants and items, as well as by-participant and by-item random slopes on all factors (Barr, Levy, Scheepers, & Tily, 2013). For the binomial FPRO measure on the Critical and Post-Critical regions, and for the Regressions In measure on the

Imposition region, separate by participants and by items logit mixed models were constructed as the model that included both participant and item random effects failed to converge. The FPRO models used only Statement Phrasing as a random slope, while the Regressions In models used Statement Phrasing and Degree of Imposition additively as a random slope.

The analyses were carried out using the *lme4* package (Bates, Maechler, Bolker, & Walker, 2015) to fit the linear mixed models for the reading time measures in *R* (R Development Core Team, 2015). Pairwise comparisons conducted with the *lsmeans* package (Lenth & Hervé, 2015) were used to investigate significant interactions for these reading time measures. The *glmer* function in the *lme4* package with Laplace approximation was used for the FPRO and Regressions In measures. Below we report regression coefficients (*b*), standard errors, and *t*-values (for duration measures) or *z*-values (for the binomial measure). Restricted maximum likelihood estimation was used for the reporting of linear mixed model parameters, and maximum likelihood estimation for the reporting of logit mixed model parameters. Deviation coding was used for each of the two experimental factors (Barr et al., 2013). Absolute values of the *t*-value and *z*-value greater than or equal to 1.96 indicate an effect that is significant at approximately the .05 alpha level. For pairwise comparisons we report the *t*-values and *p*-values. Degrees of freedom are approximated using the Kenward-Roger method. The means for each eye movement measure (calculated over participants) for the Imposition region are displayed in Table 2, and for the Critical and Post-Critical regions in Table 3. The results of the linear mixed models are reported in Tables 4, 5 and 6

Table 2: Reading times and standard errors for the Imposition region averaged over participants.

Statement	First Pass	Regression	Regressions	Total Time
Phrasing/Degree of Imposition	(ms.)	Path (ms.)	In (%)	(ms.)
<hr/>				
Imposition Region				
Indirect/High	1,887 (70)	2,155 (73)	22 (3)	2,202 (75)
Indirect/Low	2,071 (62)	2,429 (80)	28 (3)	2,680 (90)
Direct/High	1,885 (63)	2,196 (89)	20 (2)	2,285 (92)
Direct/Low	1,977 (71)	2,390 (95)	29 (3)	2,565 (94)

Table 3: Reading times and standard errors for the Critical and Post-Critical regions averaged over participants.

Statement	First Pass	Regression	First Pass	Total Time
Phrasing/Degree of Imposition	(ms.)	Path (ms.)	Regressions Out (%)	(ms.)
Critical Region				
Indirect/High	1,025 (38)	1,518 (55)	29 (3)	1,474 (51)
Indirect/Low	1,056 (46)	1,607 (60)	31 (3)	1,627 (59)
Direct/High	1,138 (51)	1,616 (65)	27 (3)	1,594 (57)
Direct/Low	1,086 (46)	1,586 (59)	31 (3)	1,579 (64)
Post-Critical Region				
Indirect/High	1,477 (51)	1,651 (53)	9 (2)	1,692 (61)
Indirect/Low	1,505 (55)	1,824 (64)	12 (2)	1,833 (63)
Direct/High	1,427 (54)	1,562 (60)	5 (2)	1,621 (57)
Direct/Low	1,408 (48)	1,683 (56)	11 (2)	1,648 (55)

Table 4: Results of the linear mixed models for the Imposition Region and measures of interest. Significant effects are highlighted in bold.

	Duration measures									Binomial measure					
	First Pass			Regression Path			Total Time			Regressions In – by participants			Regressions In – by items		
	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>z</i>	<i>b</i>	SE	<i>z</i>
Imposition Region															
Intercept	1951	98	19.82	2291	116	19.79	2435	120	20.26	-1.297	0.138	-9.937	-1.155	0.088	-13.148
Statement Phrasing	-39	45	-0.87	6	55	0.12	-19	52	-0.37	-0.069	0.133	-0.519	-0.046	0.120	-0.383
Degree of Imposition Interaction	-132	58	-2.277	-230	71	-3.22	-382	80	-4.75	-0.493	0.133	-3.704	-0.447	0.178	-2.509
	83	83	1.00	77	99	0.80	204	96	2.13	-0.158	0.243	-0.649	-0.108	0.237	-0.454

Table 5: Results of the linear mixed models for the Critical Region and measures of interest. Significant effects are highlighted in bold.

	Duration measures									Binomial measure					
	First Pass			Regression Path			Total Time			First Pass Regressions Out – by participants			First Pass Regressions Out – by items		
	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>z</i>	<i>b</i>	SE	<i>z</i>
Critical Region															
Intercept	1076	59	18.30	1583	72	22.10	1569	76	20.58	-0.94	0.10	-9.20	-0.89	0.09	-9.56
Statement Phrasing	71	65	1.01	31	103	0.30	36	86	0.42	-0.12	0.12	-1.00	-0.05	0.13	-0.38
Degree of Imposition Interaction	11	37	0.30	-34	49	-0.68	-69	40	-1.73	-0.13	0.11	-1.15	-0.13	0.11	-1.15
	82	78	1.06	131	82	1.60	169	80	2.10	-0.11	0.22	-0.47	-0.08	0.22	-0.36

Table 6: Results of the linear mixed models for the Post-Critical Region and measures of interest. Significant effects are highlighted in bold.

	Duration measures									Binomial measure					
	First Pass			Regression Path			Total Time			First Pass Regressions Out – by participants			First Pass Regressions Out – by items		
	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>z</i>	<i>b</i>	SE	<i>z</i>
Post-Critical Region															
Intercept	1451	67	21.54	1676	75	22.25	1695	74	22.98	-2.72	0.18	-15.01	-2.39	0.13	-18.36
Statement Phrasing	-65	34	-1.92	-105	51	-2.06	-120	42	-2.87	-0.37	0.25	-1.46	-0.40	0.20	-1.94
Degree of Imposition	4	28	0.15	-137	49	-2.79	-76	42	-1.83	-0.66	0.19	-3.54	-0.60	0.18	-3.44
Interaction	36	56	0.64	45	93	0.48	99	65	1.51	-0.58	0.38	-1.54	-0.52	0.35	-1.49

Imposition Region

On First Pass and Regression Path we found an effect of Degree of Imposition such that sentences with a high degree of imposition were read more quickly than sentences with a low degree of imposition. As these sentences differ lexically, there should be caution in over-interpreting what this might mean. No other effects were significant on these measures. On the measure of Total Time, we found an effect of Degree of Imposition and an interaction between Statement Phrasing and Degree of Imposition. Total reading times indicated that the difference between the High versus the Low Degree of Imposition conditions was greater in the context of Indirect statements than in the context of Direct statements (a difference of 478 ms. vs. 280 ms., $t(28.5) = 4.745, p < .001$ vs. $t(23) = 3.310, p = .003$). On the measures of Regressions In, we found an effect of Degree of Imposition such that there were more

regressions back to this region in the Low versus the High Degree of Imposition conditions (29% vs. 21%).

Critical Region

On First Pass, Regression Path and First Pass Regressions Out measures we found no effect of Statement Phrasing, Degree of Imposition and no interaction between these two factors.

On the measure of Total Time, we found a significant interaction between Statement Phrasing and Degree of Imposition. Total reading times indicated that Direct statements were read at the same speed in the High versus the Low Degree of Imposition conditions (1,594 vs. 1,579 ms., $t(27.31) = 0.247$, $p = 0.806$), while Indirect statements were read more quickly in High versus the Low Imposition condition (1,474 vs. 1,627 ms., $t(20.94) = 3.026$, $p = 0.006$).

Post-Critical Region

On First Pass reading times we found no effect of Statement Phrasing, Degree of Imposition and no interaction between these two factors. On Regression Path and Total Time measures we found a main effect of Statement Phrasing such that reading times to the post-critical region following Direct statements were faster than reading times following Indirect statements (1,623 ms. vs. 1,738 ms. for Regression Path, 1,635 ms. vs. 1,763 ms. for Total Time). On Regression Path times we found a main effect of Degree of Imposition such that reading times to the post-critical region following the High Degree of Imposition conditions were faster than reading times following Low Degree of Imposition conditions (1,607 ms. vs. 1,754 ms.). Additionally, there were more First Pass Regressions Out of the post-critical

region in the Low Degree of Imposition conditions versus the High Degree of Imposition conditions (12% *vs.* 7%).

Discussion

In an eye-tracking experiment we examined how readers process requests that were phrased indirectly and directly in contexts that did or did not motivate the use of indirect language (i.e., contexts that involved requests that placed a high versus a low level of imposition on the request recipient). High imposition contexts are face-threatening as they involve a reduction in the autonomy of the request recipient. This is because both parties know that the recipient is likely to respond favourably to the request. For low imposition contexts, there is no such reduction in autonomy (and thus no threat to the recipient's face). We found that statements involving indirect language were read more quickly when presented in contexts in which the level of imposition on the request recipient was high than when it was low. According to Politeness Theory, a high level of imposition motivates the use of indirect language. This effect emerged on the measure of total reading time for the Critical Region. As this measure reflects the total time involved in reading the particular region of text, it captures both initial reading and subsequent re-reading. The lack of an effect on measures that tapped into initial reading suggests that it takes some time for the influence of the degree of imposition of a request to be exerted on how indirect language is processed. For statements involving direct language, the picture is somewhat different. We found no effect of the degree of imposition of a request on any measure of reading statements involving direct language. These statements were read at the same speed regardless of the degree of imposition of the associated request. We propose that this is because the meaning communicated in the statements that were phrased directly is relatively easy to extract without recourse to the

context in which those statements occur. Therefore, any effects of the degree of imposition of the request are likely to be relatively weak (if they exist at all).

On the Post-Critical Region of text that followed the statements, we found that reading times were elevated when this region followed indirect language relative to when it followed direct language. This effect emerged on both Regression Path and Total Time measures of reading. We propose that the slowdown following the comprehension of indirect language reflects the inferential activity involved in readers establishing the meaning that is communicated indirectly. In contrast, statements involving direct language convey their meaning directly so less subsequent inferencing is required in order for them to be understood. We also found a relative slowdown in reading on the Post-Critical Region of text following statements in the context of requests that had a low level of imposition (and thus a low likelihood of success). This penalty emerged on the regression path measure for both direct and indirect language and likely reflects a simple effect of plausibility. It is a little odd for someone to utter a request, and for that request to be accepted by the recipient, if prior context suggests that the request is not likely to result in the desired outcome (cf. Albrecht & O'Brien, 1993). We also found an increase in First Pass Regressions Out on the Post-Critical Region of text in the low level of imposition condition. Again, this disruption likely reflects readers' sensitivity to plausibility, with the reading of implausible events causing more disruption to eye movements than the reading of plausible events. This plausibility effect also explains why there were more regressions back to the sentence that described the degree of imposition in the low degree of imposition conditions. Interestingly, we also found an interaction in terms of total reading times for the Imposition Region: the difference between the low and high degree of imposition conditions was greater in the context of indirect versus

direct statements. This is consistent with the view that indirect language is motivated by the degree of imposition of a request and that readers are sensitive to this during comprehension.

The experiment we report above is one of the few to look at how the comprehension of requests that are phrased indirectly operates in light of face-saving considerations during a naturalistic reading task (cf. Bašnáková, Weber, Petersson, van Berkum, & Hagoort, 2014, for an fMRI study on how indirect replies are comprehended). As we described in our introduction, there is remarkably little psycholinguistic work examining the time course of the comprehension of non-conventionalized indirect requests. This is surprising given the importance of the role played by factors related to politeness in how people choose to frame their requests. We know from research on indirect replies that people are sensitive to violations of Grice's maxim of relevance (e.g., Holtgraves, 1998). In our experiment, we find evidence that readers are sensitive to the degree of imposition of a request motivating the use of indirect over direct language. We propose that this reflects a sensitivity to the Gricean maxim of manner. Out of context, indirect requests are unclear. We suspect the lack of an obvious meaning associated with an indirect request triggers readers to identify a likely meaning using the contextual information they have available to them. Our findings suggest that the interpersonal social factors that underlie the way in which requests are framed in indirect versus direct language inform how such utterances are processed during reading. We suspect that understanding how considerations related to interpersonal politeness influence language usage has a large amount of research potential, and hope that further work will reveal more of the interplay between these two areas.

Acknowledgements

We would like to thank the Experimental Psychology Society for funding this research, and Tony Sanford for the inspiration.

References

- Albrecht, J. E., & O'Brien, E. J. (1993). Updating a mental model: Maintaining both local and global coherence. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, *19*, 1061-1070.
- Baayen, R. H., Davidson, D. J., & Bates, D. M. (2008). Mixed-effects modeling with crossed random effects for subjects and items. *Journal of Memory and Language*, *59*, 390–412.
- Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language*, *68*, 255–278.
- Bašnáková, J., Weber, K., Petersson, K.M., van Berkum, J., Hagoort, P., 2014. Beyond the language given: the neural correlates of inferring speaker meaning. *Cerebral Cortex*, *24*, 2572–2578.
- Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). lme4: Linear mixed-effects models using Eigen and S4. R package version 1.1-8. Vienna, Austria: R Foundation. Retrieved from <http://CRAN.R-project.org/package=lme4>
- Brown, R. (1990). Politeness theory: exemplar and exemplary. In *The Legacy of Solomon Asch. Essays in Cognition and Social Psychology*, Irvin Rock (ed.), 23-38. Hillsdale, NJ: Erlbaum.
- Brown, R., & Gilman, A. (1989). Politeness Theory and Shakespeare's Four Major Tragedies. *Language in Society*, *18*, 159-212.
- Brown, P., & Levinson, S. C. (1987). *Politeness: Some Universals in Language Usage* (Vol. 4). Cambridge, UK: Cambridge University Press.
- Clark, H. H., & Schunk, D. H. (1980). Polite responses to polite requests. *Cognition*, *8*, 111-143.

- Goffman, E. (1967). *Interaction Ritual: Essays on Face-to-face Behavior*. Garden City, NY: Anchor.
- Grice, H. P. (1975). Logic and conversation. In *Syntax and Semantics 3: Speech Act*, Peter Cole and Jerry L. Morgan (eds.), 41-58. New York: Academic Press.
- Holtgraves, T. (1998). Interpreting indirect replies. *Cognitive Psychology*, 37, 1-27.
- Holtgraves, T. (2005). Social Psychology, Cognitive Psychology, and Linguistic Politeness. *Journal of Politeness Research. Language, Behaviour, Culture*, 1, 73-93.
- Holtgraves, T., & Yang, J-N. (1990). Politeness as universal: Cross-cultural perceptions of request strategies and inferences based on their use. *Journal of Personality and Social Psychology*, 59, 719-729.
- Holtgraves, T., & Yang, J-N. (1992). Interpersonal underpinnings of request strategies: General principles and differences due to culture and gender. *Journal of Personality and Social Psychology*, 62, 246-256.
- Lee, J. J., & Pinker, S. (2010). Rationales for indirect speech: The theory of the strategic speaker. *Psychological Review*, 117, 785-807.
- Leichty, G. & Applegate, J.L. (1991). Social-cognitive and situational influences on the use of face-saving persuasive strategies. *Human Communication Research*, 7, 451-484.
- Lenth, R. V., & Hervé, M. (2015). *lsmeans: Least-Squares Means*. R package version 2.18. Vienna, Austria: R Foundation. Retrieved from <http://CRAN.R-project.org/package=lsmeans>
- Lim, T. S., & Bowers, J. W. (1991). Facework solidarity, approbation, and tact. *Human Communication Research*, 17, 415-450.

- Pinker, S., Nowak, M. A., & Lee, J. J. (2008). The logic of indirect speech. *Proceedings of the National Academy of Sciences, USA, 105*, 833–838.
- R Development Core Team (2015). R: A language and environment for statistical computing [Computer software]. Vienna, Austria: R Foundation for Statistical Computing.
- Sanford, A.J. & Emmott, C. (2012). *Mind, Brain and Narrative*. Cambridge, UK: Cambridge University Press.
- Sanford, A. J., & Garrod, S. C. (1981). *Understanding Written Language*. New York: John Wiley & Sons.
- Sanford, A.J. & Garrod, S.C. (1998) The role of scenario mapping in text comprehension. *Discourse Processes, 26*, 159-190.
- Sanford, A.J. & Sturt, P. (2002). Depth of processing in language comprehension: Not noticing the evidence. *Trends in Cognitive Sciences, 6*, 382-386.