Politeness and the Communication of Uncertainty

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Abstract

Ambiguity in language derives, in part, from the multiple motivations that underlie the choice to use any particular expression. The use of some lexical items, such as probability expressions and scalar terms, can be motivated by a desire to communicate uncertainty as well as a desire to be polite (i.e., manage face). Research has demonstrated that the interpretation of these items can be influenced by the existence of a potential politeness motive. In general, communications about negative events, relative to positive events, result in higher likelihood estimates whenever politeness can be discerned as a potential motive. With few exceptions, however, this research has focused only on the hearer. In the present research we focused on the dyad and examined whether speakers vary their messages as a function of politeness, and the effect that this has on subsequent judgments made by a recipient. In two experiments we presented participants with situations that varied in terms of face-threat and asked them how they would communicate potentially threatening information. Both experiments included a second set of participants who read these utterances and provided judgments as to the degree of uncertainty conveyed by the utterance. In both experiments, messages in the face-threatening condition conveyed greater uncertainty than messages in the non-face-threatening condition, and the probability estimates made by the second set of participants varied as a function of conveyed uncertainty. This research demonstrates that when examining speakers and hearers together, severe events may be judged less likely (rather than more likely), because speakers tend to hedge the certainty with which they communicate the information.

260 words

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Politeness and the Communication of Uncertainty

Ambiguity is an inescapable feature of language use. Consider, for example, a professor who says to a student “It’s possible your paper is publishable”. The professor may have said this because she thinks there is some degree of uncertainty regarding the manuscript’s outcome. The professor might also have chosen this phrasing in order to soften her negative opinion, that is, she doesn’t think the paper is really publishable. So how should the student interpret this utterance? Multiple motivations for the use of expressions such as “possible” are one major source of ambiguity, or imprecision, in linguistic communication. Recently, researchers have begun to examine how the interpersonal motivation to be polite, or manage face, can influence the manner in which uncertainty expressions (e.g., probability terms) will be interpreted (Bonnefon, Feeney, & De Neys, 2011). Most of this research, however, has focused on the hearer, that is, how the recipient of a message will interpret a message as a function of face-threat. Rarely has the impact of this motivation on a speaker’s linguistic choices been examined, and no one has yet examined senders and receivers within the same study; that is, how face management can influence how speakers phrase their utterances and how those utterances will then be interpreted. The purpose of the present research was to conduct some initial studies in this regard. As we demonstrate, considering the speaker and recipient together alters our understanding of the role of politeness in the communication of uncertainty.

The Interpretation of Verbal Expressions of Uncertainty

Research on verbal probability expressions suggests that their use is influenced by a variety of contextual factors; various characteristics of the outcome such as severity, base-rate, magnitude, and so on influence both the choice of which probability expression to use, as well as how these expressions are interpreted. For example, Patt and Schrag (2003) asked participants to choose a probability statement in order to convey a 10 % likelihood of an event occurring when

that event differed in terms of its outcome severity (a hurricane vs. a snow storm). These participants chose expressions conveying greater likelihood for the more extreme outcome. However, when a separate group of participants were asked to provide probability estimates for these events that were described as unlikely to happen, they provided lower probability estimates for the more severe outcome. The authors suggest that people are aware that others tend to describe outcomes with more severe consequences as being more likely, and hence they adjust downward their interpretation of such expressions.

Patt and Schrag's (2003) probability estimation results are at odds with other research, however, largely because they confounded outcome severity and base rate (hurricanes are both more damaging and less frequent than snow storms) in their study. Other researchers have demonstrated that, other things being equal, people interpret probability statements as conveying a greater likelihood of occurrence for more frequent events (e.g., a slight chance of rain occurring in London) than for less frequent events (e.g., a slight chance of rain occurring in Madrid) (Wallsten, Fillenbaum, & Cox, 1986), an effect that occurs even when numerical estimates are provided (Windschitl & Weber, 1999). Base rates and severity are usually inversely correlated, and in research designed specifically to investigate this issue, Weber and Hilton (1990) observed both a base rate effect (infrequent events were estimated to be less likely to occur) and a severity effect (severe events were interpreted as more likely to occur). They were not, however, able to experimentally dissociate severity and base-rate. More recently, Harris and Corner (2011) were able to accomplish this by manipulating the severity of the consequences of an outcome (rather than the severity of the outcome itself). In three experiments they found results consistent with Weber and Hilton (1990), specifically, higher estimates of event

likelihood for outcomes with more severe consequences than the same outcome with less severe consequences.

Multiple explanations for this severity bias have been proposed. It may reflect an asymmetric loss function whereby individuals err on the side of estimating greater likelihood for outcomes with more negative consequences (Weber, 1994). Another possibility, suggested by Vosgerau (2010; but see de Moliere & Harris, 2016), is that it may be a function of arousal misinterpretation. More severe events (as well as more positive events) are more arousing than neutral events, and this results in an elevation of the estimated likelihood of the outcome. Another possibility, and the one pursued in this research, is that there may be interpersonal motivations underlying the use of different uncertainty expressions, with corresponding effects on others' probability estimates.

Politeness and the Interpretation of Uncertainty

Speakers who want to communicate uncertainty will often use probability terms to do so. For example, with “It’s possible I’ll attend the conference” a speaker may be intentionally communicating a degree of uncertainty about attending an upcoming conference. However, there are other motivations for the use of probability expressions. In particular, probability expressions have been identified as one of several strategies for conveying politeness or managing face (Brown & Levinson, 1987). Politeness is a technical term referring to the many different linguistic (and nonlinguistic) strategies that interactants employ so as to manage one another’s face. Face refers to a person’s public persona (Goffman, 1967), and it is this public persona that is symbolically attended to with politeness. The most well-known theory of politeness – by Penelope Brown and Steven Levinson (1987) – argues that potential threats to face abound during social interaction and that interactants will phrase their remarks in ways so as

to manage face, both their own and their interlocutors'. In this view, probability expressions can function as hedges on assertions that might be face-threatening. Rather than saying "You'll never finish it in time" – an expression that might threaten the recipient's face – a speaker can hedge his or her opinion with "It's possible you won't finish it in time" or "You might not be able to finish it in time", and so on. The issue for the recipient, then, is to ascertain the intended meaning of the expression. Because there are multiple reasons for its use, there is a certain degree of ambiguity.

The existence of multiple potential motives plays a role in the interpretation of these expressions. For example, Bonnefon and Villejoubert (2006) asked participants to imagine that their family doctor told them they would "possibly" develop either deafness or insomnia in the upcoming year, after which they were asked to judge the doctor's estimate of that probability. Participants judged the probability of the more severe disease (deafness) to be significantly higher than the probability of the less severe disease (insomnia). Hence, the same probability word (possibly) was judged to communicate a higher probability when it involved a more severe condition (and hence more face-threatening situation). This is because participants judged the doctor to be using "possibly" as a face-management device significantly more frequently when the condition was deafness than when it was insomnia, and they adjusted their estimates accordingly. Note that in this case it is the hearer's face that is being threatened. The speaker's face can be threatened as well, and recognition that the speaker may be managing his or her own face can influence the interpretation of probability terms. In fact, research conducted by Juanchich, Sirota and Butler (2012) suggests that speaker face management may be inferred more often than hearer face management.

A similar effect has been demonstrated with certain scalar expressions. Scalar expressions refer to words (e.g., some) that can be ordered on a scale with respect to their strength (e.g., some - all) (Levinson, 1983). It has been argued that the use of the weaker, more inclusive, term (e.g., some) implies that the stronger term (e.g., all) does not hold (Horn, 1984; Levinson, 1983). Hence, the scalar implicature for “some” is “some but not all.” Bonnefon, Feeney, and Villejoubert (2009) examined the role of face management in the interpretation of the scalar quantifier “some” and demonstrated that face management can influence whether the scalar implicature (i.e., some but not all) is generated. Specifically, when a situation is face-threatening, people are less likely to draw a scalar implicature for “some” and instead assume that “some” is being used as a hedge to politely indicate “all”. Consistent with this reasoning, Bonnefon et al. (2009) found that estimates of “some” in “Some people hated your party” were higher than estimates of “some” in “Some people enjoyed your party”. It appears that people are using their awareness of face management to guide their interpretations; in the face threatening context people are assuming that “some” is being used in the service of face management as a means of softening a negative communication. More recently, Bonnefon, Dahl and Holtgraves (2015) demonstrated that this effect varies as a function of the discourse context such that the effect is more pronounced when the scalar term is preceded by a brief silence, a dispreferred marker signaling that bad news is forthcoming.

Parallel results have been found for connectives. Just as scalar expressions can be ordered on a scale, so too can connectives such as ‘or’ and ‘and.’ Hence, the use of the disjunctive ‘or’ implicates that the conjunction ‘and’ does not hold, that is, that the exclusive interpretation is the intended interpretation. However, as with scalar expressions, these interpretations can be influenced by politeness considerations. Feeney and Bonnefon (2013)

manipulated the content connected by “or” such that it was either positive or negative (i.e., face-threatening). They found that exclusive interpretations were significantly more likely for positive content than for negative content. When the content is negative, there is a potential face management motive, and because of this, people are less likely to generate the exclusive interpretation and instead assume that both interpretations are possible.

In sum, these studies indicate that the interpretation of probability expressions, scalar terms, and connectives can be influenced by the extent to which face management is perceived as a motive for their use. In general, this research has demonstrated that as face-threat increases, the judged likelihood of a negative event increases because recipients will assume that the use of the term is at least partly motivated by a desire to manage face. Note, however, that the majority of research in this domain has focused on the hearer, that is, on how the recipient of a message will interpret the use of an ambiguous expression. But what about the speaker? To what extent do speakers actually choose expressions so as to simultaneously convey politeness and uncertainty? And if they do, what is the impact on the receiver’s interpretation of the communication?

In a naturalistic study, Merz et al. (1991) examined court testimony in medical decision making cases in which both verbal expressions of probability and numerical estimates occurred. Relevant for the present research, they found that increasing outcome severity was associated with the use of lower probability verbal expressions. This suggests that speakers may have been engaging in face management and using verbal expressions of lower probability to describe incidents with more severe outcomes. More recently, Juanchich and Sirota conducted several experiments examining the impact of face-work on the communication of uncertainty. In one set of studies (Juanchich & Sirota, 2013) participants were asked to choose the probability expression that they would use in order to convey a particular outcome. The speaker’s

communicative goal was manipulated such that they were instructed either to be informative, to avoid blame (i.e., speaker face management), or to avoid upsetting the hearer (i.e., hearer face management). As expected, when the outcome was negative, participants chose expressions that conveyed less certainty under face management instructions (both hearer-face and speaker-face) than under instructions to be informative. This effect was reversed when the outcome was positive. These results suggest that people will choose to indicate greater uncertainty when specifically told to manage face, but they do not demonstrate that people will spontaneously do so. However, in follow-up research, Sirota & Juanchich (2015) explored this issue by asking participants to choose probability expressions that they would use to convey negative information, and then assessing their communicative motives (rather than manipulating them) for choosing those expressions. Although participants most frequently chose being informative as their communicative intention, they also quite frequently (41.6%) indicated face-management as their motive. In addition, when face-management was the indicated motive, participants were more likely to choose an expression that conveyed a lower probability, relative to when they indicated that their motive was to be informative. Unfortunately, these results are somewhat limited for several reasons. First, participants conveyed only negative information, thereby leaving open the question of whether these effects would disappear (or reverse) when the information was positive or not face-threatening (as it did in Juanchich & Sirota, 2013). In other words, there was no control condition. Second, participants were forced to choose only one option, even though communication in these situations involves a balancing of informativeness and face-management, in other words, multiple motives most likely operate. Finally, a face-work motive was made salient for participants because it was the only alternative to being informative (there was an open-ended option but it was rarely used). Participants may have chosen a

particular expression for a variety of reasons, and then indicated face work as their motive because it was the only option provided.

The Present Research

The research of Juanchich and Sirota demonstrates that people will convey greater uncertainty either when told explicitly to engage in face-work, or when indicating that face-work is their primary communicative intention. What has not been examined is whether communicated uncertainty varies as a function of situational variability in face-threat, how uncertainty is communicated as a function of face-threat, and the impact that these communications have on receivers' perceptions of the uncertainty being communicated with the message. In the present research we examined these issues by presenting participants with situations that varied in terms of threat (rather than presenting them with exclusively negative situations), and then asking them how they would communicate potentially threatening information. In the first experiment we examined the communication of bad news and manipulated threat by varying the severity of the event. In the second experiment we examined opinions which were primarily threatening for the hearer, and we manipulated the degree of face-threat for the hearer. Participants in the first experiment chose from a set of utterances containing different probability expressions. In the second experiment, we took a more inductive approach and used an open-ended format simply asking participants what they would say. This allowed us to move beyond probability expressions and to examine the multiple ways that speakers might convey uncertainty. Consistent with past research (Brown & Levinson, 1987; Juanchich & Sirota, 2013), we expected participants in both experiments to convey greater uncertainty when the situation was threatening relative to when it was less threatening.

In both experiments, we also examined the (communicative) impact of these messages by having a second group of participants read the expressions chosen or written by the Part 1 participants, and then providing estimates of the probability they believed was being conveyed by the speaker. In terms of the down-stream consequences, we expected Part 2 participants to judge an event to be less likely when a speaker conveyed greater uncertainty.

Experiment 1

The purpose of this experiment was to examine whether event severity would influence which terms were chosen for communicating event probability (e.g., Merz et al., 1991), and whether the expression chosen would influence the receiver's estimate of event likelihood. This was a two-part experiment. Participants in Part 1 were presented descriptions of situations in which they were asked to indicate how they would communicate the likelihood of a negative event occurring. Both the severity and the probability of the event occurring were manipulated within the descriptions. A separate set of yoked participants in Part 2 read the descriptions and sentences chosen by the participants in Part 1 and provided estimates of the likelihood that the referenced event would occur.

Method

Participants. Participants were recruited from introductory psychology classes at a Midwestern university. One hundred students (76.0% female) participated in Part 1 and a separate group of one hundred students (67.0% female) participated in Part 2. Part 1 participants ranged in age from 18 to 42 ($M = 19.63$; $SD = 3.40$); Part 2 participants ranged in age from 18 to 21 ($M = 19.29$; $SD = 1.61$).

Materials. Six base scenarios were written, each describing a situation in which the speaker needed to convey potentially bad news to someone else. Two variables were

manipulated within each scenario: the severity of the event and the stated probability of its occurrence. There were two levels of event severity such that in the more severe version (e.g., a car needs a new transmission) the event was clearly more severe (and hence more threatening) than the less severe version (e.g., a car needs a new battery). There were three levels of probability (20%, 50%, and 80%). Severity and probability were crossed resulting in six versions for each of the six base scenarios. A sample is presented in Table 1; all scenarios are presented in the appendix.

Six experimental booklets were created. Each booklet contained the six base scenarios, with each scenario presented in one of the six versions resulting from the crossing of severity and probability. Across the experiment, an equal number of participants saw each version of each scenario, and each participant saw each of the six possible (severity x probability) conditions. Hence, the design was a 2 X 3 Severity X Probability within-subjects design.

Following each scenario were five possible utterances that could be used for conveying the bad news. Each utterance contained one probability term. These probability terms were chosen on the basis of a pre-test in which a different set of participants ($N = 50$) were asked to provide estimates of the probability conveyed by nineteen different probability terms. Based on these pretest results, terms were chosen that were significantly ($p < .05$) different from each other. The probability terms (and their corresponding mean probability estimates and standard errors) were: somewhat unlikely (35.38; 3.43), somewhat likely (47.66; 3.24), possible (56.48; 2.80), good chance (65.8; 2.71), and definitely (80.16; 3.63). Sample utterances are presented in Table 1.

Table 1**Scenario and Utterance Manipulation: Experiment 1**

Part 1 Scenario

Imagine that you borrow your dad's car for a semester. The car starts developing some problems and you take it to a shop. The shop mechanic tells you that there is a 20% / 50% / 80% probability that you need a new *battery* (transmission). You need to tell your dad about this and so you say to him:

Part 1 Utterance Choices:

It's somewhat unlikely that the car needs a new *battery* (transmission).

It's somewhat likely that the car needs a new *battery* (transmission).

It's possible that the car needs a new *battery* (transmission).

There's a good chance that the car needs a new *battery* (transmission).

The car definitely needs a new *battery* (transmission).

Part 2 Scenario and Utterance

Imagine that your son borrows your car for a semester. The car starts developing some problems and he takes it to a shop. You're wondering if the car needs a new *battery* (transmission). You ask your son and he says to you:

(Sample utterance) It's possible that the car needs a new *battery* (transmission).

What is your estimated probability that the car needs a new *battery* (transmission)?

Note: The more severe condition was created by substituting the material in parentheses for the italicized material.

For Part 2, the scenarios used in Part 1 were altered by deleting the sentence describing the probability of the event, and by switching the perspective so that the Part 2 participants imagined themselves as the recipient of the utterance (see Table 1).¹ Following each scenario was an utterance that had been chosen by one of the participants in Part 1. Participants were then asked to estimate the probability of the event occurring on a scale of zero to one hundred percent based on the response given.

Procedure. Participants in Part 1 were presented with two practice scenarios followed by one of the six scenario booklets (randomly assigned). Scenarios within each booklet were randomly ordered. Participants were asked to imagine themselves in each scenario and then to choose which of five possible responses they would be most likely to say in the situation. Each participant in Part 2 was randomly yoked to one of the Part 1 participants. Each of these participants received one booklet, and for each scenario/utterance, were asked to provide an estimate of the probability (between 0 and 100) of the described event occurring. As in Part 1, participants first completed two practice trials.

Results

Part I. Two participants were excluded from analyses for failing to follow instructions and responding randomly (i.e., they chose the lowest probability term options for the highest-probability conditions and the highest probability terms for the lower probability scenarios). Conveyed probability was treated as a five-point scale (1 = somewhat unlikely to 5 = definitely) and analyzed with a 2 x 3 Severity X Probability repeated measures Analysis of Variance (ANOVA). There was a significant main effect for severity, $F(1,97) = 4.46$, $p < 0.05$, such that participants chose lower probability expressions for the more severe event ($M = 3.28$, $SD = 1.04$)

than for the less severe event ($M = 3.38$, $SD = 1.07$). Also, as expected, there was a significant main effect of probability, $F(2,194) = 283.76$, $p < 0.01$, with participants choosing utterances conveying higher probability when the scenario described the event as more certain (see Table 2). The Severity X Probability interaction was not significant, $F(2,194) < 1$.

Part II. We first analyzed the probability estimates provided by the Part 2 participants as a function of the probability conveyed by Part 1 participants. There was a significant, positive correlation between the probability terms chosen in Part 1 and the probability judgments of Part 2, $r = 0.40$, $p < 0.01$. Similarly, a one-way repeated measures ANOVA with conveyed probability as the independent variable was significant, $F(4,255.58) = 28.55$, $p < .001$. Overall, higher levels of conveyed probability were associated with higher levels of judged probability.

Next, we analyzed probability estimates as a function of the Part 1 scenario manipulations, that is, with a 2 X 3 Severity X Probability repeated measures ANOVA. There was a significant main effect for both severity, $F(1,97) = 22.51$, $p < 0.01$ and probability, $F(2,194) = 25.08$, $p < 0.01$. The Severity X Probability interaction was not significant, $F(2,194) < 1$. Severe events were estimated as having a lower probability of occurrence ($M = 60.74$, $SD = 25.46$) than the less severe events ($M = 68.87$, $SD = 22.90$). As one would expect, probability judgments increased as a function of the probability expressed in the scenario (see Table 2).

Table 2

Probability Conveyed (Part 1) and Probability Judged (Part 2) as a Function of Event Severity and Probability: Experiment 1

	Part 1	Part 2
	Probability Conveyed*	Judged Probability (0-100)
Scenario		
More Severe Event		
20% Probability	2.38	54.86
50% Probability	3.32	58.41
80% Probability	4.14	68.95
Mean	3.28	60.74
Less Severe Event		
20% Probability	2.40	60.61
50% Probability	3.48	67.66
80% Probability	4.28	78.44
Mean	3.38	68.87

*Higher numbers indicate greater certainty: 1 = Somewhat unlikely; 2 = somewhat likely; 3 = possible; 4 = good chance; 5 = definitely.

These results suggest that event severity had an impact on eventual judged probability. To investigate the extent to which the effects of event severity and probability were mediated by conveyed probability, we conducted an Analysis of Covariance (ANCOVA) in which conveyed

probability (i.e., the probability level of the utterance chosen by the Part 1 participants) was treated as a covariate. In this analysis, the utterance chosen had a large and significant effect on judged probability, $F(1,478) = 47.57, p < .001$, and the effects of both severity $F(1, 478) = 1.46, p > .10$ and probability, $F(2,478) = 1.03, p > .10$ were no longer significant.

Discussion

As expected, when the event was more severe (and hence threatening), participants chose to use expressions conveying greater uncertainty. Hence, communications about events that had an identical likelihood of occurrence varied as a function of the extent to which the message recipient would welcome the news (i.e., the extent to which it was threatening to him or her). In this study, then, participants were not told to attend to the recipient's face (as in Juanchich & Sirota, 2013). Instead, they spontaneously chose to convey greater uncertainty when the information was more threatening.

Just as importantly, these choices had consequences. Greater conveyed uncertainty by the Part 1 participants resulted in greater perceived uncertainty by the Part 2 participants. As a result, probability estimates made by participants in Part 2 were lower for the more severe event. Although this pattern is consistent with Patt and Schragg (2003), it is the exact opposite of more recent research demonstrating estimated likelihood to be greater for a more severe (and hence threatening) outcome (Bonnefon & Villejoubert, 2006; Harris & Corner, 2011; Weber & Hilton, 1990). Of course, in the present study base-rate was not controlled, and hence lower probability estimates for more severe events could have resulted because of their lower base-rate. Critically, however, the effect of event severity on the probability estimates disappeared when the probability expressions chosen by the Part 1 participants was controlled. In short, this experiment demonstrates clearly the importance of considering the communicative dyad, that is, the speaker

and hearer together, in order to understand the processes involved in the communication of uncertainty.

Experiment 2

Experiment 1 demonstrated that event severity can influence the choice of expressions for communicating the likelihood of an event, and that those choices can have a corresponding impact on the recipient's estimate of the likelihood of that event. The purpose of Experiment 2 was to extend this research in several ways. First, in this experiment we examined how people communicated opinions, situations in which the hearer's face is threatened. Second, we explicitly manipulated face-threat, and we did so by keeping the situation constant but varying the referent of the to-be-produced utterance. That is, participants were asked to imagine conveying a negative opinion to someone who was present (face-threatening version) or someone who was not present (non-face-threatening version). This type of manipulation has been used successfully in the past (Holtgraves, 2014) and provides a control for base-rate differences. Third, in contrast to Experiment 1 in which participants were provided with expressions to choose from, participants in this experiment were asked to indicate exactly what they would say. This allowed us to examine more naturally occurring expressions. Our general expectation remained the same: participants would produce utterances that conveyed greater uncertainty when the situation was face-threatening, and utterances conveying greater uncertainty would result in lower probability estimates

Method

Participants. Participants were recruited from introductory psychology classes at a Midwestern university. Ninety students (78.9% female) participated in Part 1 and a separate group of eighty-six students (84.4% female) participated in Part 2. Part 1 participants ranged in

age from 18 to 31 ($M = 19.06$; $SD = 1.67$); Part 2 participants ranged in age from 18 to 21 ($M = 19.29$; $SD = 1.61$).

Materials. Six base scenarios were written for Part 1 in which one interactant asks another interactant for an opinion regarding something potentially negative and hence face-threatening. Two versions of each scenario were created in order to manipulate face-threat. In the threatening version the requested opinion pertained to one of the interactants. In the non-threatening version the opinion applied to someone who was not present. See Table 3 for an example; all scenarios are presented in the appendix. In addition, as in Experiment 1, there were three described levels of probability: 20%, 50%, 80%. Threat and probability were crossed resulting in six versions of each of the six base scenarios.

Six experimental booklets were created. Each booklet contained the six base scenarios, with each scenario presented in one of the six versions that resulted from the crossing of face-threat (2) and probability (3). Across the experiment, an equal number of participants saw each version of each scenario, and each participant saw each of the six possible (severity x probability) conditions.

For Part 2, the scenarios used in Part 1 were altered by deleting the sentence describing the probability of the event, and by switching the perspective so that the participants were interpreting the comments instead of producing them (see Table 3). Following each scenario was an utterance that had been produced by one of the participants in Part 1. Participants were then asked to estimate the probability of the event occurring on a scale of zero to one hundred percent based on the utterance generated by the Part 1 participant.²

Table 3**Scenario Manipulation: Experiment 2**

Part 1 Scenario:

It's obvious that *your roommate, Roxanne*, (your friend, Bridgette, from down the hall) is failing her first semester. You believe that the probability is 20%/50%/80% that she is failing due to her excessive drinking and partying. One night during dinner Roxanne asks you why you think *that she* (Bridgette) is failing and you say:

Part 2 Scenario:

It's obvious that Ethan's roommate, Roxanne, is failing her first semester. Roxanne wonders if she is failing due to her excessive drinking and partying. One night during dinner Roxanne asks Ethan why he thinks she is failing and Ethan says:

(Sample utterance) You gotta stop partying and drinking girl. You have to get focused.

Based on his remark, what do you think is Ethan's estimate that Roxanne is failing because of her drinking and partying?

Note: Substituting the material in parentheses for the italicized material creates the non-threatening version.

Procedure. The procedure was identical to that used in Experiment 1.

Results

Part 1. First, we coded utterances for various linguistic features (probability terms, hedges, and dispreferred markers) that we expected participants would use as a means of

communicating uncertainty. However, the occurrence of these features was relatively infrequent and so we focused instead on indirectness, one of the major dimensions for engaging in face-work (Brown & Levinson, 1987; Holtgraves, 1998). To measure the indirectness of participants' messages we developed a five-point scale of increasing indirectness as follows. First, responses that directly conveyed the event as described in the scenario were classified as direct and received a one. For example, for the scenario in Table 3, a response such as "You're partying too much" would be classified as direct. Responses which conveyed the reason stated in the scenario, but did so indirectly such that an inference was required (e.g., Well I'd be failing too if I partied that often) were classified as a two on the scale. Responses that articulated an opinion that was different from what was in the scenario (e.g., She's had a tough time adjusting to being on her own) were classified as three. Responses that indirectly conveyed an unstated reason were classified as a four (e.g., She's become a wild child), and responses in which the speaker avoided answering the question by saying something along the lines of "I don't know why" were classified as the most indirect at five. All responses were independently coded by two coders (blind to conditions), and there was an 88.2% agreement rate for the five category scheme. Disagreements were successfully resolved via discussion. If an utterance contained multiple components its score was based on the first codeable component. All utterances and their coding are available at xxxxxxxx.

Level of indirectness was analyzed with a 2 x 3 Face-threat X Probability repeated measures ANOVA. There was a main effect of face-threat, $F(1,87.53) = 9.92, p < 0.01$ such that participants were more indirect when the scenario was face-threatening ($M = 2.29, SD = 1.33$) than when it was non-face-threatening ($M = 1.99, SD = 1.27$). Hence, as in Experiment 1, participants conveyed lower levels of certainty regarding an event when the context was

threatening. As expected, there was also a main effect for probability, $F(2, 174.45) = 11.02, p < .01$. As the stated probability of the event decreased, participants generated more indirect responses (see Table 4). The Face-threat x Probability interaction was not significant, $F(2, 169) < 1$.

Part II. The probability estimates provided by the Part 2 participants were analyzed as a function of the responses generated by the Part 1 participants. As in Experiment 1, there was again a significant effect for response, $F(4, 189.96) = 18.74, p < 0.01$. As can be seen in figure 1, increasing levels of utterance directness were associated with increased estimates of the probability of the event. Pair-wise tests indicated significant ($p < .05$) differences between all means except for indirectness levels 3 and 4. In addition, a simple correlation between judgments and the 5-point indirectness scale was significant, $r = -0.42, p < .01$. When the Part 1 responses were treated as dichotomous (direct vs. not direct), there was a significant effect on judgment, $F(1, 79.38) = 30.18, p < .001$. Part 2 participants judged the probability of the event to be significantly greater for utterances coded as direct ($M = 80.49, SD = 21.42$) than for utterances coded as indirect ($M = 63.05, SD = 29.47$). Clearly, the indirectness of the messages generated by the Part 1 participants had a substantial effect on the uncertainty judgments made by the Part 2 participants.

Table 4***Mean Indirectness of Responses (Part 1) as a Function of Face-Threat and Probability: Experiment 2***

	Higher Face-Threat	Lower Face-Threat
20% Probability	2.60	2.33
50% Probability	2.25	1.95
80% Probability	2.02	1.69
Mean	2.29	1.99

*Higher scores indicate greater indirectness.

We also analyzed probability estimates as a function of the Part 1 scenario variables (face-threat and probability). There was a significant main effect for probability, $F(2,170) = 6.31, p < .01$, but not face-threat, $F(1,85) < 1$.

Exploratory Analyses. We conducted additional exploratory analyses of the utterances generated by the Part 1 participants in order to search for additional linguistic mechanisms that might be used to convey potentially face-threatening information. In one set of analyses we used the Linguistic Inquiry and Word Count program (LIWC; Pennebaker, Booth, & Francis, 2007) to examine possible linguistic and content differences as a function of the face-threat manipulation. There were significant differences in terms of type of pronoun used, although this was expected and essentially uninformative because the scenario referent constituted the face-threat manipulation. However, the following are significant differences (all $ps < .05$) that also occurred.

Figure 1: Part 2 Probability Estimates as a Function of Part 1 Indirectness

There were more past tense verbs in the face-threatening (4.0%) than non-face-threatening condition (2.94%), $F(1,89) = 3.94$, with the reverse occurring for present tense verbs (11.28% vs. 13.02%), $F(1,89) = 4.36$. Also, there were more affective verbs (both positive (e.g., glad) and negative (e.g., sorry)) in the non-face-threatening version (8.13%) than in the face-threatening version (5.39%), $F(1, 89) = 12.05$, more cognitive mechanisms (e.g., consider) in the non-face-threatening version (22.22%) than in the face-threatening version (18.33%), $F(1,89) = 14.6$, and more certainty terms (e.g., absolutely) in the non-face-threatening version (2.23%) than in the

face-threatening version (1.18%), $F(1,89) = 7.82$. In addition, there were more relative words (i.e., words reflecting change; e.g., still) in the face-threatening situation (9.08%) than non-face-threatening situation (6.58%), $F(1,89) = 11.91$, more discrepancy words (e.g., could, should, ought, etc.) in the non-face-threatening condition (3.25%) than in the face-threatening condition (2.2%), $F(1,89) = 6.65$, and more exclusion words (e.g., but, either, if) in the non-face-threatening condition (3.34%) than in the face-threatening condition (2.11%), $F(1,89) = 8.19$.

We also coded utterances for the use of hedges (i.e. maybe, could, seems), dispreferred markers (i.e. well), probability terms, and phrasing responses as questions. There were no significant differences found except for the use of questions. Responses were significantly more likely to be phrased as questions in the face-threatening condition (19.6%) than in the non-face-threatening condition (2.2%), ($p < .05$, McNemar test). Finally, we examined the extent to which any of these differences were related to the probability judgments made by the Part 2 participants. However, none of these differences were significantly (all $ps > .05$) related to probability judgments made by Part 2 participants.

Discussion

Part 1 participants were asked to generate messages designed to convey negative information with varying degrees of likelihood. Regardless of the stipulated likelihood, when the negative information pertained to someone who was present, the messages were significantly more indirect than when the information pertained to a non-present person, and more indirect messages resulted in significantly lower probability estimates being made by the Part 2 participants. Hence, with a different task and topic, these results provide a conceptual replication of Experiment 1.

The use of an open-ended production task in this study allowed us to explore in more detail the different ways in which people might communicate uncertainty when the information is face-threatening. Somewhat surprisingly, participants included relatively few probability terms in their messages, even though explicit probability information was provided in the scenarios. Given the prominence played by probability terms in past research on communicating uncertainty, this is a finding that deserves additional attention. Instead of probability terms we focused on message indirectness, or extent to which the message directly conveyed what was in the experimental scenarios. And this variable did vary significantly and substantially as a function of face-threat. This makes sense, of course, as indirectness is a primary mechanism for politeness and face management (Brown & Levinson, 1987). It should be noted that this indirectness measure also varied as a function of manipulated probability. Hence, messages describing reasons assumed to be 20% likely were significantly more indirect than those assumed to be 50% likely. And so on. This provides evidence for the validity of our indirectness measure, and suggests that indirectness is a major dimension for conveying uncertainty, at least in these types of interpersonal situations. These results, then, suggest that in interpersonal situations the linguistic manifestations of uncertainty are more molar, that is, conveyed with the overall directness of an utterance, rather than variability in the use of specific probability expressions. And even though exploratory analyses indicated some significant differences in the use of different word types as a function of face-threat, these differences were not related to hearers' probability judgments.

General Discussion

As much research has shown, there is considerable ambiguity involved in the communication of uncertainty, especially in the linguistic communication of uncertainty.

Probability expressions, when they are used, can be interpreted differently as a function of various contextual factors. Most notable in this regard is the effect of the severity of the outcome being described. When base-rate frequencies are controlled, people are more likely to interpret probability expressions regarding severe events as indicating greater likelihood than the same expression regarding a less severe event (Bonnefon & Villejoubert, 2006; Harris & Corner, 2011; Weber & Hilton, 1990). Although there are no doubt multiple reasons for this severity effect, researchers have recently explained it in terms of an interpersonal motivation. Multiple studies have demonstrated how the interpretation of a variety of uncertainty terms can vary as a function of whether or not a potential politeness motive is salient, that is, a motive to linguistically manage face. Probability expressions (Bonnefon & Villejoubert, 2006), scalar terms (Bonnefon, Feeney, & Villejoubert, 2009), and connectives (Feeney & Bonnefon, 2013) have all been investigated with the same basic result: if a politeness motive can be discerned, the meaning of that term will be adjusted upward to accommodate this motive. This is because politeness is assumed to be a more likely motive for the use of an uncertainty term for events with more severe, and hence threatening, outcomes.

With few exceptions, past research in this area has focused on the hearer rather than on the speaker, that is, on interpretation rather than production. Communication, of course, involves at least two entities, a speaker and a hearer. In interpersonal situations speakers design their utterances for a recipient, and sometimes this fine-tuning involves interpersonal considerations. When the communication of uncertainty is broadened so as to include this perspective, the question becomes not how will an expression be interpreted, but rather what expression will be used by a speaker, and how will variability in those choices influence the degree of certainty that is perceived by the hearer.

In the present research we used this broader perspective and focused on both the speaker and the hearer; our results add an additional layer of complexity to this phenomenon. First, our results demonstrate clearly that speakers do take politeness into account when generating messages. In both experiments, participants either chose or produced messages that conveyed greater uncertainty when the situation was face-threatening relative to when it was not face-threatening. When presented with face-threatening situations, participants in Experiment 1 chose messages that conveyed a lower probability level, and participants in Experiment 2 generated messages that were more indirect. These results, then, are consistent with Sirota and Juanchich (2013) and Juanchich and Sirota (2015), but also extend their findings by demonstrating a spontaneous responsiveness to relatively subtle manipulations of threat.

Second, in Experiment 1 we examined probability expressions, the primary linguistic mechanism that has been investigated in this research domain. In Experiment 2, however, we used an open-ended format. These participants could have used probability expressions, but for the most part they chose not to. In fact, one of the striking findings in this experiment was how infrequently probability expressions were used. These participants did communicate uncertainty, however. But in a subtler way. Rather than asserting a particular outcome (You're partying too much) and then softening it with a politeness hedge (It's possible you're partying too much), the more common technique was to use more interpersonally oriented politeness mechanisms and convey the meaning indirectly (e.g., Some people tend to overdo it with the partying; Do you think you're partying too much?). In contrast to more formal situations in which uncertainty is communicated, for example a physician communicating information about an illness, or a financial advisor giving advice about an investment, in interpersonal situations of the type investigated here, a much greater diversity of linguistic mechanisms are used to convey

uncertainty. Telling one's father that his car may need a new transmission, or that one's roommate may be doing poorly in school because she's partying too much, is different from conveying probability information regarding investments or climate change. Interpersonal considerations come into play in a way that differs from the communication of uncertainty in more abstract situations. But they do communicate uncertainty, as the results of Experiment 2 clearly suggest. In short, face-work is complex and may be accomplished in a variety of ways in addition to the use of probability expressions.

The third major finding in this research is that the choices made by the speakers in Part 1 had communicative consequences. In both experiments, the greater the uncertainty conveyed in the message, the lower the probability estimates made by the recipients of those messages. Hence, this effect was consistent over the two experiments and encompasses both probability expressions (Experiment 1) and indirectness (Experiment 2). An important theoretical consequence of this finding is that when speakers and hearers are considered together as a dyad, then people will sometimes provide lower (rather than higher) estimates for the likelihood of more severe or threatening outcomes. This was clearly the case in Experiment 1 although not in Experiment 2 (an issue we take up below). Importantly, this pattern is the exact opposite of the previously demonstrated severity effect. For example, Bonnefon and Villejoubert (2006) found that participants judged a higher likelihood of occurrence for a negative event, due to the belief that a probability expression was partly motivated by politeness. So, estimates of the likelihood of deafness for the utterance "You'll possibly develop deafness" were significantly higher than estimates of the likelihood of insomnia for "You'll possibly develop insomnia". In the current research, however, more severe events were described with expressions conveying less certainty, and this resulted in lower estimates of likelihood. This is not trivial. Although people may

interpret the same expression differently as a function of politeness, speakers may also vary the expressions that they use to convey the same information, with a corresponding impact on recipients' perceptions of the probability being conveyed.

This raises the issue of coordination between the speaker and hearer (Clark, 1996). This issue has been examined empirically with the identification of referents (e.g., Keysar, Barr, Balin, & Paek, 1998), but the communication of uncertainty requires coordination as well. On the one hand, there is some evidence that this type of coordination does occur. As demonstrated in the present research, speakers use uncertainty terms to manage face, and as demonstrated by other researcher (e.g., Bonnefon & Villejoubert, 2006), recipients appear to be aware of this and adjust accordingly. This does not, however, preclude the possibility of miscommunication. Recipients might, for example, fail to take into account the speaker's perspective in choosing to use a particular expression and fail to adjust their interpretation. Or not. Both possibilities occurred in this research. The part 2 participants in Experiment 1 demonstrated insufficient adjustment. That is, the greater uncertainty conveyed by the part 1 participants for more severe outcomes resulted in lower probability estimates by the part 2 participants. In other words, the latter failed to take into account the possibility that the part 1 participants were communicating increased uncertainty for more severe outcomes. In contrast, the part 2 participants in Experiment 2 did display sufficient adjustment. Even though more threatening situations were described with greater uncertainty, and even though greater conveyed uncertainty was associated with lower probability estimates, the face-threat manipulation did not have a direct effect on the probability estimates, suggesting that the part 2 participants were taking into account the possibility that the conveyed uncertainty was partly motivated by politeness. There are multiple differences between Experiments 1 and 2 that could account for this discrepancy (e.g., content,

hearer-threat vs. speaker-threat, etc.). For example, the Experiment 1 scenarios involved relatively straightforward facts of varying severity, but the Experiment 2 scenarios involved opinions that were threatening to the recipient (or someone else when the situation was non-threatening). It seems reasonable that a politeness motive was more salient in the latter experiment, thereby increasing the likelihood that the part 2 participants would adjust accordingly. This is clearly an important issue and one deserving of attention. Regardless of whether individuals adjust enough or not, what the present research demonstrates is that concerns with face can influence the type of message that a speaker produces, and that particular message can then have a substantial effect on the hearer's interpretation. And this can occur independently of the degree to which the hearer adjusts.

It may be possible, of course, to produce expressions that attend to face but do not impact subsequent probability interpretations. In Experiment 2 we found multiple linguistic differences between messages in the face-threatening and non-face-threatening condition, differences that, individually, did not have an appreciable effect on subsequent probability judgments. For example, the use of past tense verbs varied as a function of face, as did the use of questions, but neither were significantly related to receivers estimated probabilities. It's possible, then, that interactants may be able to simultaneously attend to face without altering the probability information that they are conveying. But this seems to hold only at the molecular level. As our results suggest, at a more molar level, probability expressions and indirectness clearly influence estimates of the probability being conveyed

The framework developed here is relatively general and can be extended in various ways, in addition to those already noted. For example, there are other variables that have been demonstrated to influence a speaker's concern with face management, and hence their levels of

politeness and indirectness. Foremost in this regard is power. Much research demonstrates that speakers are more concerned with managing the face of those who are higher in power (Holtgraves, 2010), and recent research has demonstrated that this can affect the manner in which uncertainty terms are interpreted (Holtgraves, 2014). For example, an ambiguous evaluative expression (e.g., I like it) uttered by a lower-power speaker will be interpreted as a less positive evaluation than the same utterance provided by a higher-power speaker. This is because the lower-power speaker is assumed to be relatively more concerned with managing face, and hence the evaluation is adjusted downward. In other words, observers reason that the positive evaluation is at least partly motivated by face-work rather than being completely sincere. The relevance of this for the present research is straightforward. Because of their greater concern with face management, a lower power speaker is more likely to convey greater uncertainty (i.e., greater indirectness or more uncertain probability terms) than a higher power speaker, and this, depending on the degree of uncertainty conveyed, can influence the hearer's estimated probability.

Another issue for subsequent research is to examine how face management influences the interpretation of these terms. Specifically, how and when does the recognition of politeness impact this process? Does awareness of face-management short-circuit the need for deep processing and serve as heuristic guidance to a face-management interpretation? Is the recalibration of probability estimates a part of this recognition? Or do recipients only adjust their estimates after being asked? Although there has been research examining the comprehension processes involved in scalar quantifiers such as “some” (Bott & Noveck, 2004; Bott, Bailey, & Grodner, 2012; Breheny, Katsos, & Williams, 2006; Degen & Tanenhaus, 2011; Tomlinson,

Bailey, & Bott, 2013), the role that the conversational context, and especially face-management, play in this process is unknown.

The linguistic communication of uncertainty is inherently ambiguous and people are pretty poor at it. For example, in our second experiment, the participants in Part 2 grossly overestimated the probability of the low probability event being described; the mean estimate was 65.03% ($SD = 28.74\%$) which far exceeded the probability of 20% given to the Part I participants. This is consistent with other research (e.g., Budescu, Broomell, & Por, 2009) demonstrating the regressive nature of numerical probability estimates based on probability expressions. The point is that expressing probabilities with natural language is difficult. It is even more difficult because of the interpersonal processes that influence both production and interpretation. In the present research we focused on the interpersonal motive of face management. This, of course is not the only motive that can play a role in the communication of uncertainty. Lee and Pinker (2010), for example, suggest that indirectness can serve as a means of creating deniability when attempting to perform acts that are less than savory (e.g., threatening someone). If a threat is recognized as a potential motive, then the interpretation of uncertainty expressions (e.g., It's possible some people could get hurt) will likely be altered. Ultimately, the role of other motives will need to be considered when developing models regarding the communication of uncertainty.

Appendix

Scenarios used in Experiments 1 and 2

Experiment 1 Scenarios

1. Imagine that you have recently been feeling poorly, so you visit the campus health center. The doctor tells you that there is a 20%/50%/80% probability that you have a cold/mono³. Your mom calls to check on you and asks how your appointment went. You tell your mom:
2. Imagine that you borrow your dad's car for a semester. The car starts developing some problems and you take it to a shop. The shop mechanic tells you that there is a 20%/50%/80% probability that you need a new battery/transmission. You need to tell your dad about this and so you say to him:
3. Imagine that your family is planning a trip to Florida over summer vacation. You are preparing for the trip when you hear on the radio that there is a 20%/50%/80% probability of rain/a hurricane while you're there. You must tell your parents about the inclement weather and you say:
4. Imagine that you are preparing for your next semester of college. You are on the phone with the financial aid office when they tell you that there is a 20%/50%/80% probability that your student loans will be delayed/reduced due to the government shutdown. You need to tell your dad about this and you say:
5. Imagine that you work in an office on campus, and your boss has asked you to get some posters printed for her presentation later today. You call the print shop to check on her posters. The print shop informs you that there is a 20%/50%/80% probability that the posters will be late/are lost. You need to tell your boss and you say:

6. Imagine that you have been having some trouble heating your house. You ask a friend to check the furnace for you. Your friend says that there is a 20%/50%/80% probability that the pilot light is out/furnace is broken. You have to tell your landlord about it and you say:

Experiment 2 Scenarios

1. After graduating from college, Tyler (Cody) began submitting job applications. He was not, however, getting any job offers. You believe that the probability is 20%/50%/80% that Tyler's (Cody's) lack of job offers is due to his low GPA at graduation. When Tyler asks you why you think he's (Cody's) not getting any job offers you say:

2. For some reason your roommate, Rachel, (a mutual friend of you and your roommate, Dana,) has no money to pay for her share of the rent. You believe that the probability is 20%/50%/80% that the reason she has no money is because of her gambling problem. You are alone with Rachel when she asks you why you think that she (your mutual friend Dana) never has any money for the rent and you say:

3. You're working for a local candidate for mayor who recently experienced a drop in his approval rating. You think that there is a 20%/50%/80% probability that the drop in ratings is due to the recent exposure of his affair. You are in a meeting with the candidate (the candidate's assistant, Paul) when he (Paul) asks you why you think his (the mayor's) ratings have dropped and you say:

4. Your roommate, Leah, (A mutual friend of you and your roommate, Robbie,) was in a minor car accident. You think that there's a 20%/50%/80% chance that the reason for the accident was because she was texting while driving. You are alone with Leah when she asks you what you think caused her (Robbie's) accident and you say:

5. As the assistant manager of your cell phone retail store, you notice that Jake is making far less in commission lately than has been his norm. You believe that there is a 20%/50%/80% probability that the reason for this is his recent trouble with his girlfriend. One night after work you're having a drink with Jake (another store employee, Lukas,) and he asks you why you think he (Lukas asks you why Jake) has been performing so poorly and you say:

6: It's obvious that your roommate, Roxanne, (your friend, Bridgette, from down the hall) is failing her first semester. You believe that the probability is 20%/50%/80% that she is failing due to her excessive drinking and partying. One night during dinner Roxanne asks you why you think that she (Bridgette) is failing and you say:

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Footnotes

¹It should be noted that adopting the perspective of the recipient (part 2) may have been somewhat more difficult than adopting the perspective of the speaker (part 1).

²If the majority of a part I participant's responses could not be coded, then he or she was not assigned a part II counterpart to interpret those responses. This explains the sample size discrepancy between parts I and II.

³Short for mononucleosis

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