

## Fast track report

# Can negative mood improve your conversation? Affective influences on conforming to Grice's communication norms

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### Abstract

*Can temporary mood influence people's communication strategies? According to Grice's cooperative principle, conversational utterances should ideally conform to the maxims of quantity, relevance, quality, and manner. Three experiments predicted and found that participants in a negative mood complied significantly better with Grice's maxims than did participants in a positive mood when using natural language to describe a previously observed social event. Experiments 2 and 3 further confirmed that mood influenced communication strategies, and not merely the encoding (Exp. 2) and retrieval (Exp. 3) of the relevant information. These findings are consistent with affect–cognition theories predicting that positive affect promotes a more internally focused and assimilative thinking and communication style, and negative mood promotes more externally focused and accommodative thinking, resulting in the closer observance of communication norms. The relevance of these findings for recent affect/cognition theories is considered, and the practical implications of the results for everyday conversational strategies are discussed. Copyright © 2013 John Wiley & Sons, Ltd.*

Language is the major currency of social life, and conversations lie at the heart of our personal relationships and our ability to influence others (Prislin & Crano, 2012). How do fluctuating affective states influence people's conversational strategies? Despite growing evidence for the important role of affect in social cognition and behavior (Forgas & Koch, 2013), there has been very little research on mood effects on conversations. These three experiments are among the first to explore the effects of temporary mood on people's tendency to comply with Grice's (1975, 2008) pragmatic conversational maxims.

### The Pragmatics of Communication

Language, although comprised of a finite set of lexical symbols, allows communicators to produce an infinite variety of messages (Hauser, Chomsky, & Fitch, 2002). However, effective communication also requires that communicators obey the *pragmatic rules* about how to create and derive *intended meaning* from the literal meaning of an utterance (Wänke, 2007). Among the best known formalizations of such pragmatic guidelines is Grice's (1975, 2008) *cooperative principle*, stating that when *sharing information* communicators need to encode and decode intended meaning in accordance with the conversational maxims of *quantity*, *quality*, *relevance*, and *manner*. These Gricean maxims “represent a set of expectations about [cooperative] communication that allows for interpreting a speaker's intended meaning” (Wänke, 2007, p. 226).

The maxim of *quantity* calls for messages to be as informative, but not more so than required. The maxim of *quality* requires truthfulness and reliability. The maxim of *relevance* demands the provision of only relevant information. Finally, the maxim of *manner* requires communicators to avoid obscurity and ambiguity, and to be brief and orderly (Grice, 1975, pp. 45–46). Jointly, these communication norms require communicators to clearly send an appropriate amount of exclusively relevant and truthful information. In turn, receivers can assume that they receive sufficient, pertinent, reliable, and well-structured information to promote understanding.

These well-known guidelines define how information can be most efficiently shared (Wänke, 2007), and communicators are expected to adhere to the cooperative principle to be effective (Grice, 1975). However, these maxims do not represent absolute imperatives but rather ideals that in practice are often violated either intentionally or inadvertently (Wänke, 2007). For example, violating the quantity and relevance maxims by saying “There's the door!” instead of “Please leave now!” serves to *indirectly* communicate anger beyond the literal meaning of the utterance. In addition to such purposeful violations, speakers often deviate from conversational norms in a negligent fashion, which may give rise to confusion and misunderstandings. As distinct from such external, consensual norms of communication, communicators may also pursue internal communication goals (e.g., saving time or effort, being funny, or popular) that conflict with Grice's conversational maxims. As a result, actual communicative performance may fluctuate as a function of

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various internal and external influences, including the possibility of mood effects, to be considered next.

### Affect and Communication

Little is known about the psychological variables that determine compliance with Grice's (1975) cooperative principle. However, recent research suggests that affective states do play an important role in the way people represent and process social information in general, and the way they interpret and generate verbal messages in particular (Bless & Fiedler, 2006; Forgas, 1999, 2007). Affect has an important influence on social cognition and behavior, consistent with the idea that affective states "exist for the sake of signalling states of the world that have to be responded to" (Frijda, 1988, p. 354). There is considerable recent evidence that positive and negative affect elicit qualitatively different information processing styles (Bless & Fiedler, 2006; Fiedler, 2001; Forgas & Koch, 2013; Förster & Dannenberg, 2010; Fredrickson, 2001).

According to Bless and Fiedler's (2006) *assimilative/accommodative* processing model, affective states perform an important adaptive, evolutionary function, subconsciously influencing the kind of information processing strategies people adopt. According to this theory, positive mood signals that the social environment is benign, so that *assimilative* processing is appropriate allowing people to "impose internal structures on the external world" (p. 66). In contrast, negative mood subconsciously signals a challenging social environment calling for more externally focused and *accommodative* processing where people focus more on external norms and expectations and "modify internal structures in accordance with external constraints" (p. 66).

How should such processing differences influence communication strategies? Conforming to Grice's (1975) conversational maxims is driven by external, consensual expectations and the needs of the listener, as distinct from the internal intention of the communicator. As negative mood increases accommodative processing and attention to external norms (Bless & Fiedler, 2006; Forgas & Koch, 2013; Tan & Forgas, 2010), it should also increase the speaker's attention to the external communication norms of quantity, quality, relevance, and manner. In other words, the degree of speakers' conformity to the cooperative principle (Grice, 1975) reflects their attention to the external norms of how information is to be shared (Wänke, 2007). Of course, communicators may often pursue competing internal communication goals (e.g., saving time, being funny, and being popular) that conflict with the consensual normative expectations formalized in Grice's conversational maxims. Thus, we hypothesized that negative mood should increase, and positive mood decrease senders' attention to and compliance with Grice's external norms of effective communication.

Other affect-cognition theories, such as Fredrickson's (2001) *broaden-and-build* model also argue that negative affect should focus attention on the task and promote normative thinking, whereas positive affect should expand attention and unconventional thinking. In a similar way, Förster and Dannenberg's (2010) *global-local* processing model also predicts that negative mood should elicit more context-sensitive thinking and by implication, greater attention to Grice's conversational maxims. Several recent experiments also suggest that positive mood may

reduce, and negative mood may increase peoples' tendency to conform to social norms (Tan & Forgas, 2010). Extrapolating from this literature, these experiments explored the possibility that positive affect may reduce, and negative affect may increase the degree to which people follow the conversational maxims proposed by Grice (1975).

### The Present Experiment

Thus, to the extent that conformity to Grice's (1975) conversational maxims requires attention to external normative demands, negative mood should increase, and positive mood should decrease adherence to the communication norms of quantity, quality, relevance, and manner. This prediction is also supported by recent research consistent with the *assimilative-accommodative* dichotomy, showing that people in a good mood pay less attention to external information, are less sensitive to external norms, and are more influenced by internal heuristics and judgmental biases than are people in negative mood (Forgas, 1998, 1999, 2011; Tan & Forgas, 2010; Unkelbach, Forgas, & Denson, 2008). Accordingly, we predicted that negative mood compared with positive mood should result in greater adherence to the pragmatic communication norms identified by Grice (1975, 2008). Experiment 1 was designed to explore this prediction in a realistic, spoken communication task.

## EXPERIMENT 1

### Method

#### *Participants and Overview*

Ninety-eight students (30 men and 68 women) who participated in the study for course credit were told on arrival that they would participate in two ostensibly unrelated studies: "evaluating edited film clips" (the mood manipulation), and "describing a social interaction". First, they watched brief films designed to induce positive, neutral, or negative moods. Next, they watched a videotaped interaction between a man and woman and were then asked to conversationally describe the episode "as if you were telling a friend who wants to know what happened".

#### *Mood Induction*

On arrival, participants were shown one out of three brief films designed to elicit positive, neutral, and negative moods (excerpts from *The Jungle Book*, a nature documentary, and *The Shawshank Redemption*), ostensibly as part of a separate 'film evaluation study'.

#### *The Conversation Task*

Participants next watched a complex episode from *Annie Hall*, showing a male and female arguing and flirting with each other. This scene was selected because it contains both positive and negative elements that can be described in a variety of ways.

Participants were then asked to engage in a hypothetical conversation and to “describe the episode you just observed to a friend”. Their speech was recorded and subsequently transcribed into text to remove any paralinguistic features (e.g., tone of voice and pitch).

Each speaker was also asked to rate on seven-point “not at all-very much” scales: (a) their *motivation* to think about and describe the episode (“To what extent were you motivated to think about the social interaction?”; “How much did you feel like describing the social interaction?”,  $\alpha=0.68$ ); (b) their *processing fluency* experience (“How easy was it to think about the social interaction?”; “To what extent did you find it difficult to describe the social interaction?” (reverse-scored),  $\alpha=0.62$ ); and (c) their *self-rated adherence* to Grice’s cooperative principles of *quantity* (“To what extent did you provide an appropriate amount of information?”), *quality* (“...provide only truthful / evidence-based information?”), *relevance* (“...keep to the point?”), and *manner* (“...describe the social interaction in an orderly, comprehensible fashion?”),  $\alpha=0.74$ .

Finally, the effectiveness of the mood induction was validated. Participants rated on two nine-point scales (“bad-good” and “sad-happy”) how they had felt immediately after the mood induction. A careful debriefing concluded the experiment.

### Dependent Variables

The transcribed conversational narratives were first divided into distinct communicative acts by a coder blind to condition. Five independent raters then rated each speech act for compliance with Grice’s conversational maxims (see later text), achieving good inter-rater reliability ( $Mr=0.71$ ,  $SD=0.06$  for *quantity*;  $Mr=0.36$ ,  $SD=0.11$  for *quality*;  $Mr=0.35$ ,  $SD=0.14$  for *relevance*; and  $Mr=0.73$ ,  $SD=0.06$  for *manner*). Their judgments were averaged for further analysis. These four measures were not redundant, as the mean within-coder correlations were consistently low:  $Mr(quantity, quality)=0.09$ ,  $SD=0.09$ ;  $Mr(quantity, relevance)=0.06$ ,  $SD=0.15$ ;  $Mr(quantity, manner)=-0.24$ ,  $SD=0.08$ ;  $Mr(quality, relevance)=0.15$ ,  $SD=0.06$ ;  $Mr(quality, manner)=0.04$ ,  $SD=0.13$ ; and  $Mr(relevance, manner)=0.12$ ,  $SD=0.15$ .

**Defining Quantity and Relevance.** As Grice (1975) noted, quantity and relevance are interdependent, as providing irrelevant information necessarily amounts to providing too much information, and failing to provide relevant information necessarily amounts to providing too little information. To overcome this problem, we defined the *quantity* violation index in terms of the number of relevant pieces of information missing, and the *relevance* violation index as the number of irrelevant pieces of information included in a participant’s narrative. Relevance was operationalized by identifying the average number of communicative acts used by participants ( $M=12$ ), and the target episode was then independently divided into the same 12 basic and relevant information units by 2 independent raters. All other pieces of information were defined as irrelevant to describing the target episode. Thus, *quantity* violation scores were higher as more relevant information units were omitted ( $M=5.78$  out of 12,  $SD=1.67$ ), and *relevance* violation scores were greater as more irrelevant information units were included ( $M=1.10$ ,  $SD=0.91$ ).

**Defining Quality and Manner.** *Quality* violation was scored by counting the number of untrue or speculative information

units produced by each participant ( $M=0.71$ ,  $SD=0.67$ ; e.g., “he didn’t keep eye-contact with her”). *Manner* violation was assessed by rating the following: (a) the average number of words used per communicative act (i.e., a *prolixity score*,  $M=9.22$ ,  $SD=1.99$ ; inter-rater agreement:  $Mr=0.62$ ,  $SD=0.21$ ); (b) the number of communicative act repetitions (i.e., a *redundancy score*,  $M=1.91$ ,  $SD=1.31$ ; e.g., “he keeps freaking out” and “he keeps doing this”; inter-rater agreement:  $Mr=0.51$ ,  $SD=0.13$ ); and (c) the number of pauses and filler words/phrases used (i.e., a *discontinuity score*,  $M=12.35$ ,  $SD=5.11$ ; inter-rater agreement:  $Mr=0.97$ ,  $SD=0.01$ ). The prolixity, redundancy, and discontinuity scores were transformed into Z-scores and averaged for each participant and across coders to obtain a combined manner violation Z-score.

### Results

Three participants were excluded because they produced more than 3 SDs more words than the overall mean ( $M=180$ ,  $SD=62$ ), leaving 34 positive, 27 neutral, and 34 negative mood speakers in the final analysis.

#### Mood Validation

The mood self-ratings on the “sad-happy” and “bad-good” scales were highly correlated,  $r(95)=0.95$ ,  $p<0.001$ , and an analysis of variance (ANOVA) of the combined scales confirmed that our mood manipulation was highly effective,  $F(2, 92)=102.78$ ,  $p<0.001$ ,  $\eta^2=0.69$ . As expected, the speaker’s mood was significantly better after watching the positive rather than neutral film ( $M_{pos}=7.33$ ,  $SD=1.83$ ;  $M_{neu}=5.05$ ,  $SD=1.01$ ),  $t(59)=5.80$ ,  $p<0.001$ ,  $d=1.60$ , and significantly better after watching the neutral rather than negative film ( $M_{neg}=2.76$ ,  $SD=0.81$ ),  $t(59)=9.82$ ,  $p<0.001$ ,  $d=2.51$ .

#### Amount of Communication

As mood states may also influence motivation reflected in the quantity of communication which may in turn confound adherence to Grice’s conversational maxims, we first assessed mood effects on the overall amount of material produced. Two univariate ANOVAs found no mood effects on the total number of words spoken ( $M_{pos}=186$ ,  $SD=59$ ;  $M_{neu}=176$ ,  $SD=54$ ;  $M_{neg}=170$ ,  $SD=54$ ;  $F(2, 92)=0.72$ , NS), and on the time spent speaking ( $M_{pos}=76$  s,  $SD=18$  s;  $M_{neu}=77$  s,  $SD=19$  s;  $M_{neg}=73$  s,  $SD=17$  s,  $F(2, 92)=0.34$ , NS). The fact that communicators produced a comparable amount of material in each mood condition suggests that any qualitative difference in conversational strategies is unlikely to be due to quantitative and motivational effects. The absence of motivational influences is also supported by an analysis of self-rated motivation, showing no difference across the three mood conditions,  $M_{pos}=3.50$ ,  $SD=1.43$ ;  $M_{neu}=3.57$ ,  $SD=1.16$ ;  $M_{neg}=3.79$ ,  $SD=1.31$ ;  $F(2,92)=0.44$ , NS.

#### Compliance with Grice’s Conversational Maxims

First we assessed overall mood effects on complying with Grice’s cooperative principle by performing an ANOVA on the average of the four Z-scores measuring violations of the

maxims of quantity, relevance, quality, and manner. As predicted, those in negative mood complied significantly better with the conversational maxims than did those in positive mood,  $t(66)=2.14$ ,  $p < 0.05$ ,  $d=0.52$  ( $M_{pos}=0.18$ ,  $SD=0.60$ ;  $M_{neg}=-0.11$ ,  $SD=0.48$ ). Transgressions by the neutral group were in between the positive and negative mood groups ( $M_{neu}=0.03$ ,  $SD=0.57$ ) but were not significantly different from either,  $t(59)=1.01$ , NS; and  $t(59)=0.96$ , NS, respectively.

Looking at each conversational maxim separately (Figure 1) we found a significant mood effect on compliance with the quantity maxim when controlling for individual differences in the total number of words spoken ( $M_{pos}=6.17$ ,  $SD=1.74$ ;  $M_{neg}=5.68$ ,  $SD=1.62$ ;  $F(1, 65)=6.64$ ,  $p < 0.05$ ,  $\eta^2=0.09$ ). Speakers in a negative mood also complied with the relevance and manner maxims to a significantly greater extent than did those in positive mood (relevance:  $M_{pos}=1.26$ ,  $SD=0.93$ ;  $M_{neg}=0.81$ ,  $SD=0.82$ ;  $t(66)=2.06$ ,  $p < 0.05$ ,  $d=0.51$ ; manner:  $M_{pos}=0.17$ ,  $SD=0.46$ ;  $M_{neg}=-0.08$ ,  $SD=0.56$ ;  $t(66)=2.02$ ,  $p < 0.05$ ,  $d=0.49$ ). Compliance with the quality maxim was also greater in negative than in positive mood at a level approaching significance (quality:  $M_{pos}=0.85$ ,  $SD=0.83$ ;  $M_{neg}=0.55$ ,  $SD=0.42$ ;  $t(66)=1.84$ ,  $p=0.06$ ,  $d=0.47$ ).

Taking a closer look at compliance with the manner maxim revealed that the observed mood effect was mainly driven by differences on the prolixity subscale (prolixity:  $M_{pos}=9.90$ ,  $SD=2.29$ ;  $M_{neg}=8.90$ ,  $SD=1.72$ ;  $t(66)=2.03$ ,  $p < 0.05$ ,  $d=0.50$ ; redundancy:  $M_{pos}=1.96$ ,  $SD=1.33$ ;  $M_{neg}=1.88$ ,  $SD=1.41$ ;  $t(66)=0.24$ , NS; and discontinuity:  $M_{pos}=13.25$ ,  $SD=5.21$ ;  $M_{neg}=11.81$ ,  $SD=5.51$ ;  $t(66)=1.11$ , NS). We found no evidence for gender effects (all  $t$ s  $< 1.00$ ), except that females had a greater tendency to repeat communicative acts than did males,  $M_{female}=2.11$ ;  $SD=1.41$ ;  $M_{male}=1.46$ ,  $SD=0.89$ ;  $t(93)=2.25$ ,  $p < 0.05$ ,  $d=0.56$ .

### Self-rated Compliance with Grice's Conversational Maxims

Speakers' self-rated compliance with the conversational maxims was overall significantly correlated with their actual compliance,  $r(93)=0.25$ ,  $p=0.01$ , confirming that speakers had some valid metacognitive awareness of their communication strategies. We further explored the variables that influenced self-ratings of compliance to maxims by computing a multiple linear regression

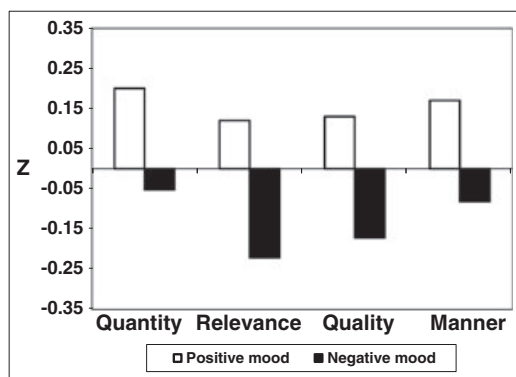


Figure 1. Mood effects on adherence to Grice's (1975) conversational maxims (Z-scores): overall, negative mood produces fewer overall violations of the cooperative principle in spoken language compared with positive mood

of self-rated compliance on speakers' mood, the number of words spoken, the time spent speaking, speakers' motivation, and their processing fluency. By using the enter method, a significant model emerged,  $F(5,87)=5.74$ ,  $p < 0.001$ , adjusted  $R^2=0.20$ , indicating that processing fluency was the only significant predictor of self-rated compliance,  $\beta_{fluency}=0.37$ ,  $p < 0.001$ . Thus, participants who reported greater processing ease also reported that they adhered more to Grice's maxims.

### Discussion

These results confirm for the first time that negative mood can improve people's adherence to Gricean conversational maxims when describing an observed event. This pattern is consistent with the assimilative/accommodative processing model and other recent affect-cognition theories (Bless & Fiedler, 2006; Fiedler, 2001; Förster & Dannenberg, 2010; Fredrickson, 2001). In particular, participants who were induced into negative mood provided fewer irrelevant and untrue or speculative information, used fewer words per communicative act, and provided more relevant information than did those in a positive mood, revealing a stronger tendency to comply with the conversational maxims of relevance, quality, manner and quantity, respectively.

Interestingly, mood effects on adhering to Grice's (1975) conversational maxims were not mediated by differences in the amount of communication (number of words spoken, time spent speaking), suggesting that it was not differential effort or motivation that produced these results. Although participants had some metacognitive awareness of their compliance with Grice's (1975) communication norms, they were unaware of any mood effects, as self-reported mood did not influence their conversational strategies. This is consistent with suggestions by Bless and Fiedler (2006) that moods operate *subconsciously* to elicit assimilative and accommodative processing styles.

### EXPERIMENT 2

To confirm and extend these results, a follow-up experiment with different mood induction films and a different (written) communication task was conducted. Experiment 1 also leaves open the possibility that communicators in a negative mood simply observed and extracted more relevant, less irrelevant, and more truthful information about the observed episode (an encoding effect), rather than showing a mood effect on communicative strategies, as we hypothesized. Experiment 2 was thus designed to rule out the possibility of mood effects at the encoding stage and confirm that mood had a genuine influence on communication strategies by manipulating mood *after* the target episode was presented but *before* the communication about the episode.

### Method

#### Participants and Procedure

Seventy-nine members (28 men, 51 women) of Amazon's crowdsourcing service Mechanical Turk were paid \$1.5 each to take part in an online experiment. First, they watched an

ambiguous episode from *Magnolia*, showing a male officer discussing a noise complaint with a female tenant. Then, they watched a short movie scene from *The Jungle Book* or *The Lion King*, selected to induce positive and negative mood, respectively. Next, participants were instructed to “imagine that a friend wants to know what happened during the encounter. Please write 10-15 sentences describing the encounter”. Finally, participants rated on 7-point “not at all–very much” scales: (a) *liking*: “How did you like the scene?”; (b) *motivation*: “How motivated were you to write about the scene?”; (c) *processing fluency*: “How easy was it to write about the scene?”; and (d) *recall memory*: “How well did you remember what happened in the scene?”. Finally, participants rated on two 9-point scales (“bad–good” and “sad–happy”) how they had felt immediately after the mood induction.

### Dependent Variables

As in Experiment 1, each subject’s narrative was first split into distinct communicative acts, and these were then rated for compliance with Grice’s conversational maxims by a coder blind to condition. A secondary coder blind to condition achieved significant agreement with the primary coder (quantity:  $r=0.76$ ; quality:  $r=0.79$ ; relevance:  $r=0.73$ ; and manner:  $r=0.80$ ). Again, there was little redundancy across the four measures, as confirmed by low within-coder correlations:  $r(\text{quantity, quality})=0.27$ ,  $p<0.05$ ;  $r(\text{quantity, relevance})=-0.17$ , NS;  $r(\text{quantity, manner})=-0.32$ ,  $p<0.01$ ;  $r(\text{quality, relevance})=-0.09$ , NS;  $r(\text{quality, manner})=-0.12$ , NS; and  $r(\text{relevance, manner})=0.00$ , NS.

Compliance with the quantity, relevance, quality, and manner maxims (Grice, 1975) was operationalized using the same procedure as described in Experiment 1. This time 15 information units were identified as relevant and essential to describing the episode. However, discontinuity (formerly a part of manner violation) was not used, because writing does not involve filled pauses and filler words as does speech. Overall, subjects omitted 7.51 ( $SD=2.12$ ) out of the 15 relevant information units (i.e., quantity measure), included 3.01 ( $SD=0.75$ ) irrelevant information units (i.e., relevance measure), and produced 1.55 ( $SD=1.49$ ) untrue or speculative pieces of information (i.e., quality measure). Further, they used 8.29 ( $SD=1.42$ ) words per communicative act, and repeated 3.00 ( $SD=1.77$ ) communicative acts (i.e., *prolixity* and *redundancy*, measuring compliance with *manner*; inter-rater agreement for redundancy:  $r=0.56$ ). As in Experiment 1, *prolixity* and *redundancy* scores were transformed into Z-scores and averaged for each participant to obtain a combined measure of compliance with the manner maxim.

### Results

Two participants were excluded because the time they spent writing was more than 3 SDs higher than the overall mean ( $M=269$  s,  $SD=162$  s), leaving 41 positive mood and 36 negative mood writers in the final analysis.

### Mood Validation

The two mood self-rating scales were highly correlated,  $r(77)=0.95$ ,  $p<0.001$ , and were combined into a single mood

valence measure. As predicted, a writer’s mood was significantly better after watching the positive rather than the negative film ( $M_{pos}=8.31$ ,  $SD=1.01$ ;  $M_{neg}=2.69$ ,  $SD=1.44$ ),  $t(75)=19.92$ ,  $p<0.001$ ,  $d=4.60$ , confirming the effectiveness of our mood induction.

### Amount of Communication

As in Experiment 1, mood had no effect on the total amount of words written ( $M_{pos}=124$ ,  $SD=39$ ;  $M_{neg}=123$ ,  $SD=35$ ;  $t(75)=0.27$ , NS), and the time spent writing ( $M_{pos}=233$  s,  $SD=103$  s;  $M_{neg}=271$  s,  $SD=134$  s;  $t(75)=1.40$ , NS). Further, an analysis of self-ratings showed that happy and sad communicators did not differ in their *liking* of the writing task ( $M_{pos}=5.59$ ,  $SD=2.28$ ;  $M_{neg}=5.08$ ,  $SD=2.24$ ;  $t(75)=0.97$ , NS), *motivation* for the task ( $M_{pos}=5.80$ ,  $SD=2.27$ ;  $M_{neg}=5.56$ ,  $SD=2.50$ ;  $t(75)=0.46$ , NS), *memory* for the episode ( $M_{pos}=7.44$ ,  $SD=1.74$ ;  $M_{neg}=7.97$ ,  $SD=1.48$ ;  $t(75)=1.43$ , NS), and *fluency* of the task ( $M_{pos}=6.66$ ,  $SD=2.27$ ;  $M_{neg}=6.69$ ,  $SD=2.35$ ;  $t(75)=0.07$ , NS). In other words, consistent with Experiment 1, we found no evidence for mood effects on the self-reported motivation, willingness, and effort of participants to perform the communication task.

### Compliance with Grice’s Conversational Maxims

As in Experiment 1, we first computed a Z-score indicating overall adherence to Grice’s (1975) cooperative principle across the four maxims. As expected, writers in a negative mood complied significantly better with the conversational maxims than did writers in positive mood,  $t(75)=2.31$ ,  $p<0.05$ ,  $d=0.53$  ( $M_{pos}=0.11$ ,  $SD=0.44$ ;  $M_{neg}=-0.12$ ,  $SD=0.40$ ).

A closer look revealed that those in negative mood complied with the conversational maxims of *quantity* and *relevance* to a greater extent than did those in positive mood (quantity:  $M_{pos}=8.04$ ,  $SD=2.01$ ;  $M_{neg}=7.05$ ,  $SD=2.12$ ;  $t(75)=2.10$ ,  $p<0.05$ ,  $d=0.48$ ; relevance:  $M_{pos}=3.36$ ,  $SD=1.92$ ;  $M_{neg}=2.55$ ,  $SD=1.48$ ;  $t(75)=2.05$ ,  $p<0.05$ ,  $d=0.48$ ). There was no mood effect for *quality* and *manner* violations (quality:  $M_{pos}=1.39$ ,  $SD=1.20$ ;  $M_{neg}=1.77$ ,  $SD=1.79$ ;  $t(75)=1.12$ , NS; manner:  $M_{pos}=0.08$ ,  $SD=0.68$ ;  $M_{neg}=-0.13$ ,  $SD=0.73$ ;  $t(75)=1.31$ , NS; Figure 2). However, writers in negative mood also had significantly lower

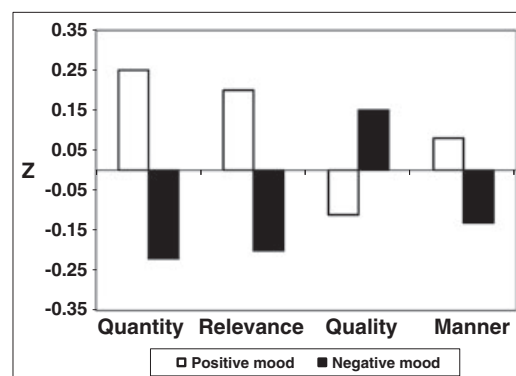


Figure 2. Mood effects on adherence to Grice’s (1975) conversational maxims (Z-scores): overall, negative mood produces fewer violations of the cooperative principle in written language than positive mood

*redundancy* scores than writers in positive mood, whereas there was no mood effect for the *prolixity* measure of manner (redundancy:  $M_{pos}=3.46$ ,  $SD=1.92$ ;  $M_{neg}=2.38$ ,  $SD=1.41$ ;  $t(75)=2.75$ ,  $p<0.01$ ,  $d=0.65$ ; prolixity:  $M_{pos}=8.41$ ,  $SD=1.66$ ;  $M_{neg}=8.15$ ,  $SD=1.21$ ;  $t(75)=0.78$ , NS).

As in Experiment 1, we found no gender differences on any of the measures (all  $t$ s  $< 1.20$ ), although males used somewhat more words per communicative act than did females,  $M_{female}=7.99$ ;  $SD=1.53$ ;  $M_{male}=8.77$ ,  $SD=1.11$ ;  $t(75)=2.34$ ,  $p<0.05$ ,  $d=0.59$ .

## DISCUSSION

These results replicate and extend the findings of Experiment 1, confirming that negative mood improved adherence to Grice's (1975) cooperative principle compared with positive mood. Writers in negative mood communicated more relevant and less irrelevant information, and observed the conversational maxims of *quantity* and *relevance* to a greater extent. More importantly, as the mood induction here occurred *before* the communication task, but *after* the target episode was already encoded, this experiment also confirms that mood effects on communication strategies were not confounded by the differential encoding of the target information.

The absence of clear mood effects on the maxim of *quality* suggests that the truth of a message is subject to greater conscious control in a written rather than in a spoken task. To gather support for this explanation, a further 61 Mechanical Turk participants (31 men, 30 women) responded to three questions on 7-point "disagree strongly–agree strongly" scales, measuring their judgment on the following: (1) it is easier to monitor the truth of one's statements in writing rather than speaking; (2) that they hesitate to speak something that may not be true; and (3) hesitate to write something that may not be true. Responses confirmed that communicators agreed that it is easier to monitor truth in writing rather than speaking ( $M=5.05$ ,  $SD=1.59$ ;  $t(60)=4.62$ ,  $p<0.001$ ,  $d=0.66$ ), and that they were less likely to be untruthful (violate the maxim of quality) when writing rather than speaking ( $M_{speak}=5.66$ ,  $SD=1.19$ ;  $M_{write}=6.05$ ,  $SD=1.02$ ;  $t(60)=3.06$ ,  $p<0.01$ ,  $d=0.35$ ). These responses confirm that writing is indeed likely to involve greater conscious control of truth than speaking, reducing mood effects on the conversational maxim of quality (Grice, 1975) compared with the maxims of quantity, relevance, and manner, as was found here.

In Experiment 1, communicators in positive mood used more words per communicative act than subjects in negative mood (i.e., they were more *prolix*). In Experiment 2 there was no such effect; however, negative mood reduced repetitions compared with positive mood (*redundancy* measure). This difference reflects the different requirements of spoken and written communication. In spoken tasks filling time is easier by lengthening communicative acts (*prolixity*), whereas in written communication, repetition (*redundancy*) may serve the same purpose. In both cases negative mood improved compliance with Grice's (1975) conversational maxim of *manner* compared with positive mood, but this mood effect took somewhat different forms depending on the spoken versus written medium of the communication task.

## EXPERIMENT 3

The results of Experiment 2 confirm that mood effects on compliance with Grice's (1975) cooperative principle could not be due to differences in *encoding* the information, as mood was induced *after* exposure to the target episode. In other words, in Experiment 2 communicators started off with the same encoded information about the event, yet they still showed marked differences in their adherence to Grice's conversational maxims depending on their mood at the time of communicating.

However, there is still the possibility that mood effects on memory *retrieval* may have confounded the way participants communicated. To exclude this possibility, and to confirm that mood influenced conversational strategies and not just information *retrieval*, in Experiment 3 we asked participants only to retrieve the details of the target episode, without engaging in a communication task. Thus, Experiment 3 sought to distinguish between mood effects on memory and retrieval, as distinct from mood effects on communicators' tendency to comply with Grice's cooperative principle.

## Method

### Participants and Procedure

Sixty-one members (27 men, 34 women) of Amazon's crowdsourcing service Mechanical Turk were paid \$1.50 each to take part in the experiment. Experiment 2 was identical to Experiment 3, except that participants were simply asked to retrieve and list the 15 relevant parts of the observed episode without communicating about it.

### Dependent Variable

Participants were provided with 15 separate text boxes to enter the 15 pieces of information that they retrieved as most relevant to the episode. Retrieval accuracy was assessed by a coder blind to condition, who counted the number of relevant information units each participant listed. Irrelevant, untrue, and redundant information was disregarded. A secondary coder blind to condition achieved significant agreement in scoring participants' retrieval performance,  $r=0.74$ .

## Results

### Mood Validation

Again, the two mood self-ratings were highly correlated,  $r(60)=0.92$ ,  $p<0.001$ , and thus were combined. Participants reported more positive mood after watching the positive rather than the negative film, confirming the effectiveness of the mood induction ( $M_{pos}=7.72$ ,  $SD=1.07$ ;  $M_{neg}=2.93$ ,  $SD=1.31$ ),  $t(58)=15.53$ ,  $p<0.001$ ,  $d=4.02$ .

### Amount of Communication

There was no difference between the positive and negative mood conditions in the total amount of words written ( $M_{pos}=$

122,  $SD=41$ ;  $M_{neg}=122$ ,  $SD=35$ ;  $t(58)=0.01$ , NS), and the time spent writing ( $M_{pos}=233$  s,  $SD=103$  s;  $M_{neg}=271$  s,  $SD=134$  s;  $t(58)=1.40$ , NS), suggesting that the two groups were equally motivated to perform the task.

### Mood Effects on Retrieval

We found no mood effects on retrieval, as participants in positive mood retrieved as many relevant information units as did those in negative mood ( $M_{pos}=8.19$ ,  $SD=1.44$ ;  $M_{neg}=8.24$ ,  $SD=1.78$ ;  $t(58)=0.11$ , NS). This confirms that the mood effects on communication strategies observed in both Experiments 1 and 2 were due to neither differential *encoding* (Experiment 2), nor differential *retrieval* (Experiment 3). Interestingly, a direct comparison between the positive mood groups across Experiments 2 and 3 also showed that those who performed an actual communication task (in Experiment 2;  $M=6.95$  out of 15;  $SD=2.01$ ) provided significantly fewer relevant information units in their message than did those who performed a simple retrieval task (in Experiment 3;  $M=8.19$  out of 15;  $SD=1.44$ ),  $t(70)=2.91$ ,  $p<0.01$ ,  $d=0.72$ , suggesting that in positive mood people tend to communicate *less* relevant information than they are able to access. No such difference was found across the negative mood participants in Experiments 2 and 3, who provided a similar number of relevant information units ( $M=7.94$  out of 15;  $SD=2.12$ , Exp. 2;  $M=8.24$  out of 15;  $SD=1.78$ , Exp. 3),  $t(63)=0.61$ , NS; Figure 3). We also found some gender differences, as females in this retrieval task provided more relevant information units than did males ( $M_{female}=8.57$ ,  $SD=1.80$ ;  $M_{male}=7.77$ ,  $SD=1.21$ ;  $t(58)=1.96$ ,  $p=0.05$ ,  $d=0.53$ ).

## GENERAL DISCUSSION

Effective communication requires speakers and writers to follow the kind of pragmatic norms formalized in Grice's (1975) influential conversational maxims. Even though affect is probably the primary dimension of interpersonal behavior (Forgas, 2002), no previous study looked at mood effects on people's compliance with Grice's conversational norms. These three experiments offer convergent evidence demonstrating that

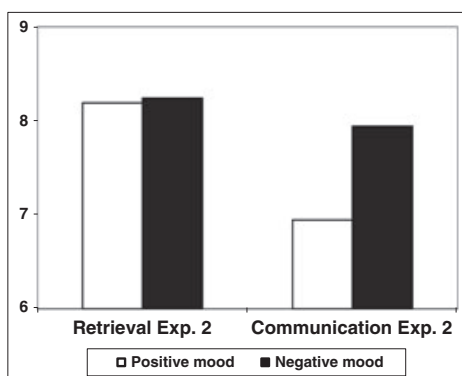


Figure 3. Mood effects on retrieval as distinct from compliance with Grice's (1975) cooperative principle (Exp. 3 versus Exp. 2): positive mood reduced compliance with Grice's maxims compared with negative mood in a communication task (Exp. 2) but did not influence mere retrieval (Exp. 3)

those in a negative mood show a greater tendency to observe Grice's maxims than do people in a positive mood. These results are consistent with theories such as the *assimilative/accommodative processing* model (Bless & Fiedler, 2006), suggesting that people in a negative mood are more attentive to external, normative requirements and are more prepared to "modify internal structures in accordance with external constraints" (p. 66).

Our findings have a number of further interesting theoretical and applied implications. We showed that communicators in a negative mood produced more relevant, less irrelevant, and more truthful information, and their descriptions were also characterized by lower prolixity, redundancy, and discontinuity compared with those in positive mood. This pattern is consistent with negative affect promoting a more accommodative, externally focused and normative processing style producing greater compliance with conversational norms (Bless & Fiedler, 2006; Fiedler, 2001; Tan & Forgas, 2010). Further, our results also indicate that mood effects on complying with Grice's maxims were not because of motivational effects, because subjects in good and bad mood consistently invested an equal amount of time, and used an equal amount of words to give an account of the target event.

Of course, communication strategies may also be influenced by one's ability to encode and remember the information to be communicated. To establish that it is indeed mood effects on communication that was demonstrated here, we need to show that encoding and retrieval effects did not confound our results, as was carried out here in Experiments 2 and 3. Experiment 2 found that mood effects on communication strategies endured even when the mood induction occurred *after* encoding, confirming that the effects were not due to encoding differences. Experiment 3 further established that simply retrieving the target information could not account for the communicative differences observed in Experiments 1 and 2.

This pattern is conceptually consistent with dual-process affect-cognition theories that predict mood-induced differences in processing strategies (Bless & Fiedler, 2006; Förster & Dannenberg, 2010; Forgas, 2002; Fredrickson, 2001). There is now growing evidence that people in negative mood tend to adopt a more externally focused, concrete, bottom-up, and situationally sensitive processing style (Bless & Fiedler, 2006). Accordingly, speakers and writers in a negative mood tend to display greater adherence to the conversational maxims of quantity, relevance, quality, and manner. This effect is conceptually consistent with other evidence showing that people in a negative mood tend to use more concrete and specific mental categories, are less likely to apply stereotypes and scripts, are better at distinguishing between central and peripheral information, and are less subject to reconstructive memory biases (Bless, Clore, Schwarz, Golisano, Rabe, & Wölk, 1996; Bless, Schwarz, & Wieland, 1996; Bodenhausen, Kramer, & Süsner, 1994; Forgas, 1998, 1999, 2007, 2011; Forgas, Goldenberg, & Unkelbach, 2009; Forgas, Vargas, & Laham, 2005; Koch & Forgas, 2012; Storbeck & Clore, 2005; Unkelbach et al., 2008).

Transgressions of communicative norms can be either intentional or unintentional. Consistent with most past research showing that mood effects on cognition and communication are generally subconscious (Forgas, 1998, 1999, 2002; Forgas & Koch, 2013), we also found that self-rated adherence to

Grice's maxims was unaffected by self-rated mood, suggesting an automatic, subconscious mechanism. Instead, speakers' ratings of their compliance with Grice's norms were more informed by their processing fluency experience, a subconscious meta-cognitive cue that has been shown to influence several types of self-related and other-related judgments (Koch & Forgas, 2012; for a review, see Alter & Oppenheimer, 2009).

### Practical Implications

Effective verbal communication is critically important in our personal and working lives, and it is the main vehicle of influencing people, especially in organizational, industrial, and clinical settings (Prislin & Crano, 2012). Violating conversational maxims can be a major source of miscommunication and misunderstanding (Prislin & Crano, 2012). Despite growing evidence for affective influences on social cognition and interpersonal behavior (Fiedler, 2001; Forgas, 1995, 2002; Schwarz, 1990; Sedikides, 1995; Storbeck & Clore, 2005), it is surprising that mood effects on everyday conversational strategies received little attention in the past. The finding that negative affect may improve compliance with conversational maxims and thus communication effectiveness has important practical implications in applied domains where effective communication is crucial, such as in personal relationships, and in practical fields such as clinical, forensic, legal, educational, and counselling psychology. Professionals working in these fields may benefit from training programs designed to increase their awareness of subconscious mood effects on conversational strategies.

Our findings, together with a growing number of related experimental studies, also suggest that positive affect may not be universally beneficial (Forgas & Koch, 2013; Gruber, Mauss, & Tamir, 2011). There is convergent evidence demonstrating that negative affect may produce distinct cognitive and behavioral benefits in many situations. For instance, negative mood can improve memory (Forgas, Goldenberg, & Unkelbach, 2009; Forgas et al., 2005), reduce judgmental errors (Forgas, 1998, 2011), and improve persuasive arguments (Forgas, 2007). To this list we may now add the additional finding that negative mood may also provide distinct communicative benefits by improving attention to Grice's (1975) conversational norms, a result that should be of considerable interest in practical and applied fields.

### Limitations and Future Prospects

There are also some limitations to these results. In particular, Grice's (1975) cooperative principle deals with conversations intended for sharing information. Other kinds of communicative encounters where receivers do not expect to be informed, or senders do not intend to share information may be influenced by mood in different ways. For example, negotiations, requesting, or persuasion represent communicative contexts where communicators' strategies may be differentially influenced by mood states (Forgas, 1998, 1999, 2007).

Further, our results may be qualified by a number of situational and contextual variables, such as the nature and personal relevance of the communication task, the complexity of the information, and motivational influences (Fiedler, 2001, 2007;

Forgas, 2002). According to the affect infusion model (Forgas, 1995, 2002), variables such as stimulus complexity, ambiguity, relevance, and cognitive load could all play an additional role in mediating mood effects. Investigating the influence of such contextual variables in mediating mood effects on communication strategies should be of considerable further interest. It would also be interesting to explore the effects of positive and negative moods on conversational transgressions in naturalistic interactions where senders and receivers constantly switch roles.

It would be desirable to replicate our findings by using other types of mood inductions, such as auditory, visual, or memory-based techniques (Martin, 1990). Further, the observed mood effects on compliance with communication norms may not be confined to Grice's (1975) conversational maxims. Research suggests that mood also has a subtle and multi-dimensional influence on the norms people follow in a variety of strategic encounters (Forgas, 2007; Tan & Forgas, 2010). Future studies may also explore adherence to communication norms as a function of distinct emotions (e.g., pride, gratitude, fear, and anger; Lerner & Keltner, 2001; Williams & DeSteno, 2008).

Finally, communicators might draw on both their own, and their conversation partner's affective states to calibrate their conversational strategy (Beukeboom & De Jong, 2008). There is recent evidence that people who comply with Grice's (1975) maxims are perceived more positively (Peters & Kashima, in press), suggesting that such compliance may function as an impression management strategy.

We should note that the results obtained in these studies are consistent not only with the *assimilative/accommodative* processing model (Bless & Fiedler, 2006) but also with other recent affect-cognition theories such as Förster and Dannenberg's (2010) global-local processing model, and Fredrickson's (2001) broaden-and-build theory. These theories make the convergent prediction that negative affect should promote the processing of concrete, local and external information, and positive affect should trigger more global, generative and internal processing. Differentiating the predictions of these theories was beyond the scope of the present experiments, but remains an important task for future research.

The absence of mood effects here between the positive and negative conditions and the neutral, control group makes it difficult to determine if it is positive mood that decreases, or negative mood that increases conformity. As nonmanipulated mood is never completely neutral (Fiedler, 2001), communicators in the neutral mood condition could have adopted either assimilative, or accommodative conversational strategies. Our demonstration here of negative versus positive mood differences in complying with conversational maxims are important, because they show, for the first time, that everyday moods can have a subtle but reliable influence on communication strategies.

### CONCLUSION

In summary, these three experiments offer the first convergent evidence that negative compared with positive mood can significantly improve peoples' tendency to conform to Grice's (1975)



conversational maxims. This appears to be an automatic and subconscious mood effect on communication style that is independent of mood-induced differences in information encoding and retrieval. Much remains to be discovered about how mood-induced processing differences may influence conversational strategies. In extending affect–cognition research to the new domain of conversational norms, our findings are consistent with recent affect–cognition theories (Bless & Fiedler, 2006; Förster & Dannenberg, 2010; Fredrickson, 2001), and in particular, highlight the important role of positive and negative mood states in influencing everyday verbal communication strategies.

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