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FlashReport

Improving communicative understanding: The benefits of global processing ☆

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ABSTRACT

The current research investigated whether a global processing style, affording a focus on the broader context, promotes communicative understanding and, in turn, communicative success. Results confirmed that compared to priming local processing, priming global processing enhanced the deciphering of potentially sarcastic statements of which participants were the receivers (Experiment 1). Experiment 2 extended these findings to oral communication: Global processing increased the correct deciphering of meanings that speakers' attempted to convey by ambiguous sentences to listeners. Overall 'seeing the forest instead of the trees' allowed receivers to attend more perceptively to the larger communicative context, thereby facilitating successful communication.

No one would talk much in society, if he knew how often he misunderstands others.

–Johann Wolfgang von Goethe, *Elective Affinities*

Introduction

Successful communication often requires going beyond literal meaning, paying attention to contexts, and inferring statements' pragmatic meaning (Clark, 1996; Clark & Haviland, 1977). To achieve this, interlocutors need to monitor their interaction partner's knowledge, the larger context, as well as non- and para-verbal information (Ambady & Weisbuch, 2010; Archer & Akert, 1977; Hilton, 1995). Unfortunately, interlocutors often have difficulties when interpreting both non-verbal information (Keysar & Henly, 2002; Lanzetta & Kleck, 1970) and oral utterances (Savitsky, Keysar, Epley, Carter, & Swanson, 2011) and are seldom aware of their limitations (Keysar & Henly, 2002). Here, we argue that priming global compared to a local processing facilitates successful communication.

Global processing and communicative understanding

When attending to an event, people may zoom out and pay attention to the entire gestalt ("see the forest") or zoom in and pay attention to details ("see the trees"). To illustrate, imagine how previously discrete dots of colors start revealing meaningful patterns as you step back from a pointillist painting. In psychological terms, these *processing styles* represent cases of content-free procedural priming that describe *how* we attend to information and may carry over to other tasks (Schooler, 2002): When globally processing we focus on the gestalt, whereas locally processing we focus on the details (Navon, 1977).

Differences in global/local processing are of central interest in cognitive, social, and clinical psychology (see Förster & Dannenberg, 2010). Of importance here, Novelty Categorization Theory (Förster, Marguc, & Gillebaart, 2010) posits that whenever people encounter something novel, unfamiliar, ambiguous or otherwise representing an information gap—the default rather than the exception for communicative acts—the global processing system "tries to make sense of it by integrating it into superordinate inclusive knowledge structures" (Förster & Dannenberg, 2010, p. 190). In contrast, whenever something is familiar and clear, the local processing system is assumed to take over, searching "for information details that differentiate the event from others" (Förster & Dannenberg, 2010). Difficulties in appreciating communicative meaning have been linked to a lack of integration of various sources of information (see e.g., Frith, 1989, on central coherence). As global processing fits the requirements of finding structural relations between stimuli to infer conveyed meaning (Förster, 2009), we hypothesized that it facilitates communicative understanding.

Consistent with this hypothesis, globally and abstractly processing (compared to locally and concretely processing) participants go

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beyond the given context and are more creative when asked to generate unusual uses for objects (i.e., create new meaning; Friedman & Förster, 2001; Friedman, Fishbach, Förster, & Werth, 2003). Furthermore, encoding of information beyond the literal information given is enhanced for abstractly (compared to concretely) processing participants, who are better at understanding new metaphors (i.e., appreciate meaning; Kuschel, Förster, & Denzler, 2010). Our reasoning is also in line with the notion of abstract processing entailing "fewer difficulties comprehending connotative meanings and figurative language in irony" (Kuschel et al., 2010, p. 9) and the suggestion that higher order representations enhance comprehension (Förster, Liberman, & Shapira, 2009). Specifically, Förster et al. (2009) showed that participants used broader (narrower) concepts when expecting to perform on a novel (familiar) task.

We tested the original hypothesis that global processing facilitates communicative understanding by examining whether it facilitates deciphering of potentially sarcastic written statements (Experiment 1) and ambiguous spoken sentences (Experiment 2).

Experiment 1

Experiment 1 tested whether global processing enhances the deciphering of written communicative intentions. Participants wrote sincere or sarcastic sentences, exchanged them, and then identified their task-partner's sentences as sincere or sarcastic. We predicted globally-primed participants to identify more sentences correctly.

Method

Participants and design

Fifty-four students (45 females) participated for course credit in a battery of unrelated studies and were randomly assigned to the global or local priming condition.

Procedure and materials

To prime local versus global processing, participants completed the global–local processing task on a computer (Navon, 1977; see also Förster, 2009; Macrae & Lewis, 2002). Participants saw a series of global letters (2.5 cm × 2.5 cm) composed of local letters (0.5 cm × 0.5 cm). At the screen center a fixation cross was presented for 500 ms before each trial. Overall, participants were presented eight global composite letters in random order over 48 trials. For each trial, they were instructed to press as quickly as possible a response key if the stimulus contained the letter *L*, and a different response key if it contained the letter *H*. In the *global priming condition* the *H*s and the *L*s were always the global letters (e.g., an *H* made of *F*s), and in the *local priming condition* they were always the local letters (e.g., an *F* made of *H*s).

Next, participants worked in dyads (comprising participants with the same processing style) for an ostensibly unrelated experiment. For this second task, each participant was given one of two six-topic lists (e.g., dating, dorm life, etc. versus romance, family life, etc.) and asked to write a short sentence about each topic (see Kruger, Epley, Parker, & Ng, 2005). According to a predetermined random order, participants wrote three sentences in a sincere and three in a sarcastic manner. They were given examples (sincere: "I do not like exams"; sarcastic: "I like exams as I enjoy a lot feeling nervous"), informed that they would judge each other's sentences in terms of sarcasm/sincerity, and asked not to use emoticons.

Participants then exchanged sheets and indicated for each task-partner's six sentences whether they were sarcastic or sincere. Our measure was the number, out of 6, of correctly judged sentences. Because global and local processing has been linked to positive and negative mood, respectively (Gasper & Clore, 2002), we asked participants how they felt (1 = *sad, bad, discontent,* and *tense* to 7 = *happy, well, content,* and *relaxed*, respectively; $\alpha = .81$) to control for possible mood effects. Furthermore, to ensure topic lists were of similar difficulty, we asked participants: "Overall, how did you experience this task?" (1 = *easy* to 7 = *difficult*).

Results and discussion

Neither participants' mood nor task difficulty were impacted by topic list, processing style, or their interaction, all Fs < 1, all ps > .32.

As predicted, globally-primed participants discriminated more correctly the meaning conveyed in the sentences ($M = 5.69$ correct identifications, $SD = 0.68$) than locally-primed participants ($M = 5.14$, $SD = 1.20$), $t(43.11) = 2.08$, $p = .044$, $d = 0.56$ (equal variances not assumed).[1]

This experiment shows that globally-primed participants were more accurate in deciphering written communication intentions. As in previous research (Kruger et al., 2005), the high rate of correctly deciphered sentences is most likely due to participants assuming they were to detect the same amount of sarcastic/sincere messages as they themselves had to write, leaving limited room for context effects to emerge.

A caveat of this experiment is that dyads consisted of similarly primed pairs. We are thus unable to tell whether effects are due to globally-primed senders writing more easy-to-decipher sentences or to globally-primed receivers understanding intended meaning better, or both. Experiment 2 investigates oral communication and addresses the potential sender–receiver question.

Experiment 2

Depending on tone, emphasis, and expression, the very same literal, local statement can convey an overall, global sarcastic or serious, disrespectful or deferential, etc. meaning (Clark, 1996; Drew, 1987). Non- and para-verbal contextual information helps people understand speakers' meaning, especially when the literal content of the message itself is ambiguous (Allbritton, McKoon, & Ratcliff, 1996; Price, Ostendorf, Shattuck-Hufnagel, & Fung, 1991). Furthermore, Experiment 2 addressed the sender/receiver ambiguity. To do so, globally- and locally-primed speakers communicated particular meanings of ambiguous phrases to globally- and locally-primed listeners. We predicted that globally-primed listeners would detect more correctly the speakers' intended meanings. Additionally, globally-primed speakers may also be uttering clearer messages. Thus, we also explored the possibility that listeners would perform better when deciphering meanings from globally- compared to locally-primed speakers' messages.

Method

Participants and design

Ninety students (76 females) who indicated not knowing each other participated in triads and were paid 5 € or received course credit for participating in a battery of studies. They were randomly assigned the speaker- ($n = 30$) or listener-role ($n = 60$) and to the global or the local priming condition (each $n = 15$ speakers and $n = 30$ listeners, respectively). Thus, within each group a (globally- or locally-primed) speaker attempted to convey intended meanings of ambiguous sentences to two listeners (one globally-, one locally-primed). We measured the number of correctly identified meanings by the *listeners* in a 2 (speaker-priming: global vs. local) × 2 (listener-priming: global vs. local) between-subjects design.

[1] In a mixed ANOVA including processing (global/local) and measure (accurate sincere/sarcastic sentences) the interaction was not significant, $F < 1$, while the main effect of processing style was, $F(1,52) = 4.15$, $p = .047$, $\eta_p^2 = .07$.

Procedure and materials

Participants *first* individually completed the global/local priming procedure as in Experiment 1. Only *after this* each group was informed that, for an ostensibly unrelated study, they were to sit back-to-back with one of them assigned the speaker-role and the other two the roles of listeners. The speakers received a list of ten phrases and three possible meanings for each phrase (taken from Savitsky et al., 2011).[2] According to a predetermined random order, speakers had to convey a unique combination of meanings (indicated in bold print). Listeners also received the list of ten phrases along with three possible meanings for each. For each phrase they were to indicate which meaning the speaker had attempted to convey. For example, the phrase: "It sure is hot in here" was accompanied by the three meanings: "You're looking hot", "Your temper is out of control", "It must be at least 30 degrees Celsius in here". Speakers continued reading the sentences once both listeners indicated having chosen amongst the possible meanings.

We controlled for mood with the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) and computed mean scores for positive (10 items; $\alpha = .86$) and negative (10 items; $\alpha = .80$) mood. Global/local priming has been found to impact on assimilation/contrast and social distance (Förster, Liberman, & Kuschel, 2008; Liberman & Förster, 2009). We therefore controlled for interpersonal closeness ("How close do you feel to your interaction partner"; 1 = *not at all close* to 9 = *very close*). Also, conveying and understanding meanings may involve communicative creativity. Because global processing fits creativity (Friedman & Förster, 2001; Friedman et al., 2003), and because fit effects may enhance enjoyment, we also controlled for task enjoyment (enjoyable, pleasant, irritating [reversed], annoying [reversed]; 1 = *not at all* to 9 = *fully*; $\alpha = .76$).

Results and discussion

Preliminary analyses indicated that neither listeners' positive or negative mood, felt closeness to their partner, or task enjoyment were influenced by either speaker- or listener-priming or their interaction, all $Fs < 2.07$, all $ps > .15$. Additionally, processing style priming did not impact speakers' positive or negative mood, felt closeness, or task enjoyment, all $ts < 1$, all $ps > .38$.

Our dependent variable was the number of correctly identified meanings by the *listeners*. An ANOVA including speaker-priming (global vs. local) and listener-priming (global vs. local) confirmed that globally-primed listeners were better at detecting speakers' intended meaning than locally-primed listeners, $F(1,56) = 5.35$, $p = .024$, $\eta_p^2 = .09$ ($M_{global} = 5.43$, $SD_{global} = 1.31$ vs. $M_{local} = 4.63$, $SD_{local} = 1.43$; see Fig. 1A). Additionally, listeners tended to be better at detecting the intended meanings from globally-primed than from locally-primed speakers, $F(1,56) = 3.01$, $p = .088$, $\eta_p^2 = .05$ ($M_{global} = 5.33$, $SD_{global} = 1.16$ vs. $M_{local} = 4.73$, $SD_{local} = 1.59$; see Fig. 1B). The interaction was not significant, $F < 1.4$, $p > .25$.

These findings confirm that globally-primed participants were better at understanding conveyed meanings of ambiguous phrases. Additionally, listening participants tended to be better at detecting conveyed meanings from globally- rather than locally-primed speakers. These results go beyond our previous findings in illustrating effects for oral communication, thus increasing our findings' ecological validity, and by teasing apart sender and receiver influences.

General discussion

Two experiments priming global versus local processing and using different paradigms to assess communicative understanding (deciphering meaning in written sentences and spoken ambiguous sentences) supported our hypothesis that global processing, with its focus on the broader context, enhances communicative understanding. We ruled out possible confounds relating to the respective experiments (i.e., mood, interpersonal closeness, task enjoyment and difficulty).

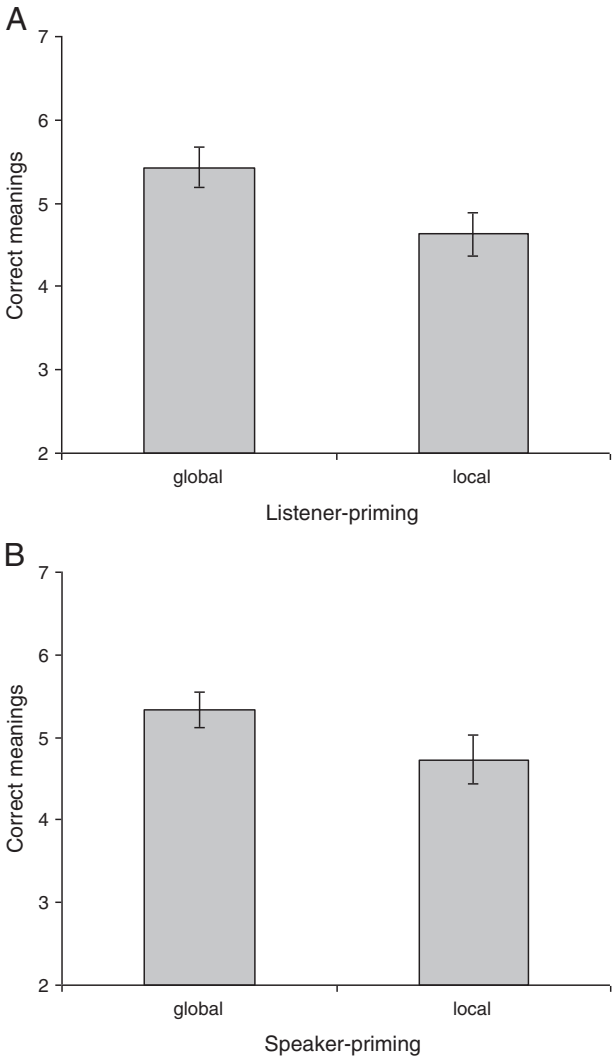

Fig. 1. A. Listeners' correctly deciphered meanings as a function of their own processing style (listener-priming: global vs. local) in Experiment 3. Error bars depict standard errors. Chance performance was at 3.33 correct sentences out of 10. B. Listeners' correctly deciphered meanings as a function of speakers' processing style (speaker-priming: global vs. local) in Experiment 3. Error bars depict standard errors. Chance performance was at 3.33 correct sentences out of 10.

The current findings extend previous work showing that global processing facilitates the understanding of metaphors (Kuschel et al., 2010) and novel stimuli (see Förster et al., 2010) to written and oral communicative contexts. Overall, they suggest that interpersonal communication benefits from global processing. As such, our research provides more solid evidence for the idea that basic cognitive processing styles have critical social implications; it demonstrates contextual influences on successful communication; and, as we outline below, it may also have implications for clinical research.

A limitation of our findings is that they remain silent as to what accounts for the effects. Two mediators might prove fruitful in future research. First, global processing involves right-hemispheric activation (Förster et al., 2008; Smith & Trope, 2006), enhances creativity (Friedman et al., 2003), and a meta-analytic review found creative thinking to also entail right-hemispheric activation (Mihov, Denzler,

[2] We thank Kenneth Savitsky for the material.

& Förster, 2010). Moreover, global processing enhances novel metaphoric understanding (Kuschel et al., 2010), which has likewise been linked to right-hemispheric activation (Faust & Mashal, 2007). Together, this strongly suggests right-hemispheric activation as a potential mediator. This contention is strengthened by research showing the unique role of the right hemisphere in understanding sarcasm (Briner, Joss, & Virtue, 2011; Shamay-Tsoory, Tomer, & Aharon-Peretz, 2005). A second candidate responsible for the integration of various informational sources to create meaning may be a similarity focus, which is linked to global processing (Förster, 2009) and metaphoric understanding (in terms of structural alignment; Bowdle & Gentner, 2005; Gentner & Markman, 1997).

We see three important future research avenues. First, our findings have potential implications for people suffering from communicative deficits. For example, schizophrenic individuals show impairments in the processing of non-literal language (e.g., irony, metaphor, indirect request), which requires the ability to process speakers' utterances beyond their literal meaning and to grasp their intention by reference to contextual information (Champagne-Lavau, Stip, & Joanette, 2006). Similar deficiencies have been documented for Parkinson's disease (Monetta, Grindrod, & Pell, 2009), right hemisphere damage (Abusamra, Côté, Joanette, & Ferreres, 2009), and autism (see Volkmar, Paul, Klin, & Cohen, 2005). The current results may serve as a first indicator for exploring the potential benefit of global processing in improving patients' abilities.

Second, we would not claim that global processing would always generate the best outcomes. Whereas communication in novel, for example intercultural, contexts should benefit most from global processing because of a fit between novelty and global processing (Förster et al., 2010), with time and interaction experience local processing may ultimately foster communicative understanding. Also, the role of processing styles may play out differently in so-called 'high-context cultures', where the social context of communication is crucial for understanding intended meaning, compared to 'low-context cultures' (Hall, 1976). Moreover, when meaning is conveyed in a syllogistic structure (A<B and B>C, which requires analytic thinking), or when the perception of function words (e.g., or, are) is crucial for overall meaning, local rather than global processing should benefit understanding (Dilley & Pitt, 2010; Förster, 2012).

Finally, differences in global versus local processing have consistently been found to be elicited by other variables (e.g., regulatory focus, construal level, power, love/sex primes; Förster, 2012), which calls for future studies investigating the extent to which communicative understanding is impacted by these variables. For example, do leaders understand sarcasm better than subordinates? Does communication flow more smoothly during romantic dates compared to booty calls? Hopefully, the present efforts will encourage researchers to investigate such intriguing issues.

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