



## Reports

## Deliberation versus intuition: Global versus local processing in judgment and choice

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## ABSTRACT

Decisions and judgments made after deliberation can differ from expert opinion and be more regretted over time than intuitive judgments and decisions. We investigated a possible underlying process of this phenomenon, namely global versus local processing style. We argue that deliberation induces a local processing style. This processing style narrows conceptual attention and can have detrimental effects on judgment and decision-making. Study 1 showed that intuitive judgments of quality of modern paintings were more accurate than were more deliberate, reasoned judgments. Study 2 showed that local versus global processing style is associated with accuracy of quality judgments of paintings, and Study 3 replicated this finding with an experimental manipulation of processing style. Finally, Study 4 showed that the effect of intuitive versus deliberative decision mode on quality judgments of poems is mediated by processing style.

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## Introduction

You invited a group of friends for lunch. You prefer to start lunch with a soup, but have severe doubts about what soup to make. Three recipes turned out to be quite successful in the past; a clam chowder, a mango gazpacho and a zucchini soup. You decide to ask a friend for advice. What should he do? Should he taste all three soups, deliberate and think carefully about what exactly he likes and dislikes about each soup, or should he simply rely on his intuition? Research has shown that judgments and preferences of people who first deliberate are sometimes less in line with expert opinion (Halberstadt & Green, 2008; Tordesillas & Chaiken, 1999; Wilson & Schooler, 1991), are more regretted over time (Wilson et al., 1993), are less consistent (Nordgren & Dijksterhuis, 2009), and reveal lower correlations with expressed behavior (Wilson & Dunn, 1986; Wilson, Dunn, Bybee, Hyman, & Rotondo, 1984) than judgments that are made intuitively. Why do people who deliberate make worse decisions? We argue that deliberation induces a local processing style that narrows conceptual attention and the latter makes it more difficult to make quality judgments.

## Deliberation versus intuition

In a classical experiment demonstrating the effects of deliberation, Wilson and Schooler (1991) asked participants to rate how much they liked different strawberry jams that varied in overall quality. Half of

the participants were asked to list their reasons for liking or disliking the jams after tasting. In this way they allegedly could better organize their thoughts before rating the jams. The remaining participants were not given a specific instruction. Results showed that participants who deliberated before making their judgment gave judgments that differed more from expert opinions than participants who relied on their intuition. This phenomenon has been replicated in several domains. Examples are quality judgments of college courses (Tordesillas & Chaiken, 1999; Wilson & Schooler, 1991), Olympic dives (Halberstadt & Green, 2008), predicting basketball games (Halberstadt & Levine, 1999), detecting deception (Albrechtsen, Meissner, & Susa, 2009), and judging the quality of paintings, apartments, and jelly beans (Nordgren & Dijksterhuis, 2009).

The work of Wilson and his colleagues (Wilson & Dunn, 1986; Wilson, Dunn, Kraft, & Lisle, 1989; Wilson, Hodges, & LaFleur, 1995; Wilson, Kraft, & Dunn, 1989; Wilson & Schooler, 1991; Wilson et al., 1984, 1993) has been very influential in shaping how we think about deliberating or analyzing reasons before making judgments or decisions. They explain the effects of deliberating as a disruption, and relate this to research showing how automatic behaviors are disrupted when people analyze and decompose them (Baumeister, 1984; Kimble & Perlmutter, 1970; Langer & Imber, 1979). In a similar way judgments can be disrupted when people reflect about the reasons underlying their judgments (Wilson, Dunn, et al., 1989; Wilson, Kraft, et al., 1989). People are often unaware of why exactly they feel the way they do. When people verbalize their thoughts and analyze their reasons, they focus on reasons that are accessible in memory, plausible, and reportable (Wilson et al., 1995; Yamada, 2009), possibly ignoring aspects that are more difficult to verbalize.

Wilson et al. (1995) asked participants to rate how much they liked a specific individual and to what extent they thought the

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individual was suitable as a social worker. Positive or negative information about the individual was made more accessible by presenting this information twice. The judgments of the participants who analyzed their reasons were more in line with the accessible information compared to participants in the control condition. Unfortunately, accessible, plausible, and reportable reasons are neither always the main determinants of people's judgments and preferences, nor do they necessarily determine the quality of these judgments (Nisbett & Wilson, 1977).

Along similar lines, Tordesillas and Chaiken (1999) argued that introspection disrupts systematic processing by directing attention in such a way that people are less able to focus on information most relevant to the task at hand. Participants in their study were presented with a description of six psychology courses and were asked to indicate their intention to participate in each of these courses. Afterwards, participants rated how much they were influenced by each separate attribute in the description of each course, how much weight each attribute should be given, and their confidence in their choice. In addition, recall of the attributes was assessed and participants listed their thoughts. Participants in the control condition listed more thoughts overall, and these were also more closely related to important as opposed to unimportant attributes, compared to participants who were asked to deliberate and analyze their reasons.

In the present study we address a possible underlying process of this phenomenon; more specifically we focus on the role of global versus local processing style as a mediating mechanism. We argue that deliberation, i.e., verbalizing thoughts and analyzing reasons, affects the way in which people attend to, select, and process information.

### Processing style

Processing style refers to the way we attend to information. People can either attend to the Gestalt of a stimulus or pay more attention to its details. A collection of trees for example can be seen as a forest, but people can also direct their attention to the individual trees (Gasper & Clore, 2002; Navon, 1977; Schooler, 2002). In a classic study Navon (1977) tested his *global precedence* hypothesis. He hypothesized that people by default look at the Gestalt of the stimulus rather than the details, and presented his participants with large letters made of smaller letters. Participants were asked to identify as quickly and accurately as possible if a target letter was presented as either the large or the small letter. He showed that people are generally faster in deciding whether the target letter is the large letter than the small letter.

Derryberry and Tucker (1994; see also Förster, 2009b; Förster, Friedman, Özel, & Denzler, 2006) suggested that these attentional mechanisms regulate both perceptual and conceptual processes. The attentional mechanism used to select conceptual nodes within the semantic network is correlated with the attentional selection mechanism utilized on a perceptual level. Friedman, Fishbach, Förster, and Werth (2003) showed that participants were more creative in generating unusual exemplars of a category after the induction of a global processing style, compared to participants who paid attention to the details. They argued that priming visual perception of the Gestalt of stimuli activates abstract concepts in memory and enhances creativity. Moreover, Förster and Dannenberg (2010a) argued that a global processing style is related to the understanding of ambiguous, complex, and abstract stimuli. In a global processing style we make sense of a stimulus by integrating it into superordinate, inclusive knowledge structures. In contrast, a local processing style is related to searching for details. Generally, a global processing style supports creativity and metaphor understanding, while a local processing style supports analytical thinking and concrete construals.

As a case in point, Macrae and Lewis (2002) showed that people are less able to recognize complex stimuli when in a local processing style. Participants in whom a local focus was induced were less able to

recognize human faces. Interestingly the same effect occurred when people gave a verbal description of human faces. Macrae and Lewis (2002) concluded that verbalizing induces a local processing style. A local processing style shifts attention to individual elements of information (featural information) in contrast to their spatial relations (configural information). Reliance on featural information makes it harder to recognize faces (Dodson, Johnson, & Schooler, 1997; Westerman & Larsen, 1997). Likewise, analyzing reasons or verbalizing thoughts before making a judgment could induce a local processing style, and this could also make it harder to judge complex stimuli.

### Overview of the present studies

The purpose of the present research is to contribute to the understanding of the underlying mechanisms of the effect of deliberation and analyzing thoughts. More specifically, we investigate whether processing style can explain the differential effect of deliberation versus intuition on judgment and choice. In Study 1 we tested our stimulus set and aimed to replicate the usual effects of deliberation versus intuition on accuracy of judgments in a specific stimulus domain, that is, the judgment of modern paintings. Our stimulus set was partly based on Nordgren and Dijksterhuis (2009), who found that people who deliberated before making their judgments were less consistent in their preferences for low- and high-quality art than participants who did not deliberate. Study 2 explored the natural co-variation of processing style and accuracy of judgments of low- and high-quality paintings. In Study 3, the effect of processing style on judgments of paintings was experimentally tested by inducing either a global or a local processing style. In Study 4 we tested whether the effect of judgment mode (intuitive vs. deliberative) on judgments is mediated by processing style.

### Study 1

As mentioned, Nordgren and Dijksterhuis (2009) observed that participants who deliberated were less consistent in their preferences for low- and high-quality paintings than were participants who did not deliberate. In Study 1 we aimed to assess the effect of deliberation on the accuracy of quality judgments with the purpose of validating our stimulus materials by replicating the findings of Wilson and Schooler (1991) in the domain of art. In the original experiment of Wilson and Schooler (1991), participants' judgments were compared with ranking scores obtained from experts. We relied on a simple dichotomy: low- versus high-quality paintings. As our main dependent variable we calculated a composite score by comparing the ratings of the high-quality paintings with the ratings of the low-quality paintings (see Method section). Similar to the experiment of Wilson and Schooler (1991), half of the participants deliberated about what they thought determined the quality of each painting, before giving a quality judgment. The remaining participants were asked to rely on their intuition while judging the paintings. We expected that participants who deliberated before rating the paintings would give poorer quality judgments than participants who made an intuitive judgment.

### Method

#### Participants

Sixty-six first year psychology students from the University of Amsterdam participated in a series of studies, including the present experiment. They participated for partial fulfillment of a course requirement. No information was available about sex and age of the participants.

#### Materials and procedure

Participants were randomly assigned to the deliberate or intuitive condition. Participants were asked to rate the quality of eight

paintings. We selected four high-quality paintings from MoMA (Museum of Modern Art, New York, website: [www.moma.org](http://www.moma.org)) and four low-quality paintings from MOBA (Museum of Bad Art, Boston, website: [www.museumofbadart.org](http://www.museumofbadart.org)). This division in quality of MoMA and MOBA paintings was confirmed by three experts in modern art (teachers at the Academy of Art; Cohen's Kappa = 1). Paintings were selected and downloaded from the institutions' respective web sites, and presented individually on a computer. Quality ratings were expressed using a 100-point slider, anchored with *very good* and *very bad*.

We computed a composite accuracy score based on the ratings of the eight paintings. Accuracy scores are less sensitive to extreme ratings for individual paintings and provide a single measurement for accuracy of judgments. For each high-quality painting that was rated higher than a low-quality painting participants received a score of +1. Using this method the score could range from 0 (no high-quality painting is rated as higher quality than a low-quality painting) to 16 points (all high-quality paintings are rated as better than all low-quality paintings).

In the intuitive condition participants were asked to rely on their initial intuitive judgment and not to think too much. As was the case in the original experiment of Wilson and Schooler (1991) we asked participants in the deliberation condition to consider separate aspects of the paintings that determined their quality, before judging each painting. They were asked to do this for 1 min for each painting.

### Results and discussion

Composite accuracy scores were subjected to an ANOVA. Participants who made intuitive quality judgments showed higher scores ( $M = 10.94$ ,  $SD = 2.55$ ) than participants who deliberated before making their judgments ( $M = 9.41$ ,  $SD = 3.13$ ,  $F[1, 64] = 4.80$ ,  $p = .032$ ,  $\eta_p^2 = .07$ ). We conclude that participants who made intuitive judgments were more accurate in their judgments of the paintings, than were participants who deliberated.<sup>1</sup>

### Study 2

In Study 2 we focused on the natural co-variation of processing style and accuracy of judgment of paintings. We expected global processing style to be positively related to the accuracy of quality judgments.

#### Method

##### Participants

Forty-seven psychology students from the University of Amsterdam participated in exchange for course credits or a monetary reward (16 male and 31 female). Age ranged from 18 to 39 years ( $M = 22.17$ ,  $SD = 3.75$ ).

##### Materials and procedure

Processing style was assessed by the global–local reaction time measure (Navon, 1977; see also Förster & Higgins, 2005). Participants were presented with a series of “global” letters made up of smaller “local” letters. In each trial the participants had to decide if either an L or an H letter was presented by pressing the corresponding letters on the keyboard. In total four different global trials were presented (an H made of Fs, an H made of Ts, an L made of Ts, and an L made of Fs), and four different local trials were presented (an F

made of Hs, an F made of Ls, a T made of Hs, and a T made of Ls). On each trial, participants were first presented with a fixation cross in the center of the screen for 500 ms. Then, one of eight global composite letters was randomly presented. In total 48 global composite letters were presented, preceded by four practice trials. Participants were instructed to react as quickly and accurately as possible.

After completing the global–local reaction time measure, participants were asked to rate the eight paintings used in Study 1 in terms of quality. Quality of the paintings was judged using a 100-point slider, anchored with *very good* and *very bad*.

### Results and discussion

Before analyzing the global–local reaction time task, incorrect responses were excluded from the analyses (Förster & Higgins, 2005). In these responses participants responded with a letter that was not presented on the screen. Median responses were used to deal with skewness (Fazio, 1990; Ratcliff, 1993; Veling & van Knippenberg, 2004). For each individual a processing style score was computed by subtracting the median response latencies for global trials from the median response latencies for local trials; thus a positive score indicates a more global processing style. Processing style scores that deviated more than 2.5 standard deviations from the mean processing style score were considered outliers and excluded from the analyses (two cases).

We computed an accuracy score in the same way as in the previous study. The mean score was 10.78 ( $SD = 3.50$ ). To test the relation between processing style and the ability to rate the paintings in terms of quality, a regression analysis was conducted with processing style as the predictor. Results revealed a significant association between processing style and the accuracy score ( $F[1, 43] = 5.36$ ,  $p = .025$ ,  $\beta = .33$ ,  $\eta_p^2 = .11$ ). The more global the processing style, the more accurately individuals were able to judge the paintings in terms of quality.

### Study 3

The previous study demonstrated a relation between natural occurring processing style and how accurate paintings were judged. In Study 3 we experimentally tested the effect of processing style on judgments of paintings by inducing a local or global processing style. We expected that participants in the global focus condition would give more accurate quality judgments than participants in the local focus condition.

#### Method

##### Participants

Fifty-two first year psychology students from the University of Amsterdam participated in the experiment in exchange for course credits. No information was available about sex and age of the participants.

##### Materials and procedure

Participants were randomly assigned to either the global or the local processing style condition. Participants completed a variation of the global–local reaction time measure as described in Study 2. To induce a global or local processing style, participants were instructed to react to either the global or the local letters (Förster & Higgins, 2005). In this variation of the global–local reaction time measure, the global composite letters were constructed in such a way that the same global composite letters could be used to induce a global as well as a local processing style (an H made of L's, an H made of H's, an L made of L's, and an L made of H's). After completing the global–local reaction time measure, participants were asked to rate eight

<sup>1</sup> Analyses of mean ratings provided additional support. The two-way interaction between quality of painting and judgment mode revealed that participants in the intuitive condition were better in differentiating between low- ( $M = 38.15$ ,  $SD = 14.73$ ) and high-quality art ( $M = 49.82$ ,  $SD = 15.36$ ) than were those in the deliberate condition (low-quality:  $M = 40.98$ ,  $SD = 11.78$ , high-quality:  $M = 46.29$ ,  $SD = 11.90$ ,  $F[1, 64] = 4.04$ ,  $p = .049$ ,  $\eta_p^2 = .06$ ).

paintings in terms of quality. The same slider and the same low- and high-quality paintings were used as in the previous studies.

### Results and discussion

One participant was excluded from the analyses because his accuracy score deviated more than 2.5 standard deviations from the mean accuracy score. The same accuracy score was computed as in the previous study. An ANOVA revealed that participants' accuracy scores were higher in the global condition ( $M = 12.00$ ,  $SD = 1.98$ ) than in the local condition ( $M = 10.23$ ,  $SD = 4.14$ ,  $F[1, 49] = 3.74$ ,  $p = .059$ ,  $\eta_p^2 = .07$ ).<sup>2</sup>

### Study 4

The previous study demonstrated a causal relation between processing style and the accuracy of quality judgments of paintings. In the final study we test whether this association between processing style and accuracy of judgments can explain the effect of judgment mode (deliberative vs. intuitive) on quality of judgment. We expected that the effect of judgment mode on accuracy of judgment would be mediated by processing style. To show that the role of processing style in judging art is not limited to paintings, we used low- and high-quality poems in the present study.

### Method

#### Participants

Seventy-five students (26 male, 49 female) at the University of Amsterdam participated in the study. Age ranged from 18 till 46 years old ( $M = 21.49$ ,  $SD = 4.12$ ). Participants were given a monetary reward or course credits for participation.

#### Materials and procedure

Participants were randomly assigned to the deliberate or intuitive condition. To control for individual variation, processing style was assessed at the beginning of the experiment and after judging the poems. This was done with the global–local reaction time measure, as described in Study 2.

After assessing processing style, participants rated the quality of eight poems using a 100-point slider, anchored with *very good* and *very bad*. Four poems were downloaded from an amateur poem internet site and classified as low-quality. The four high-quality poems had all been published and received awards. Four experts in poetry (graduates in poetry) confirmed the distinction between low- and high-quality poems.<sup>3</sup>

In the intuitive condition participants were asked to rely on their initial intuitive judgment and not to think too much. Similar to Study 1 and the original experiment of Wilson and Schooler (1991), we asked participants in the deliberate condition to report separate aspects of the poems that determined their quality. They were asked to do this for 1 min for each poem, after which they rated the quality of the poem.

<sup>2</sup> Analyses of mean ratings provided additional support. The two-way interaction between quality of painting and processing style showed that participants in the global condition were better in differentiating between low- ( $M = 37.44$ ,  $SD = 12.37$ ) and high-quality art ( $M = 52.96$ ,  $SD = 12.86$ ) than were those in the local condition (low-quality:  $M = 37.92$ ,  $SD = 10.36$ , high-quality:  $M = 46.67$ ,  $SD = 13.03$ ,  $F[1, 49] = 4.71$ ,  $p = .035$ ,  $\eta_p^2 = .09$ ).

<sup>3</sup> Cohen's Kappa ranged from  $\kappa = .50$  (one published poem was taken for an amateur poem and vice versa) to  $\kappa = 1$  (all judgments were in line with the distinction between published and amateur poems).

### Results and discussion

Two participants were excluded from the analyses because their processing style scores deviated more than 2.5 standard deviations from the overall mean. Accuracy scores were subjected to an ANOVA. Participants who made intuitive quality judgments showed higher accuracy scores ( $M = 8.19$ ,  $SD = 3.86$ ) than participants who deliberated before making their judgments ( $M = 5.19$ ,  $SD = 3.39$ ,  $F[1, 71] = 12.51$ ,  $p = .001$ ,  $\eta_p^2 = .15$ ). Thus, participants who made intuitive judgments had more accurate quality judgments of the poems than participants who deliberated. This finding replicates the findings of Wilson and Schooler (1991) and those obtained in Study 1.<sup>4</sup>

To assess the effect of judgment mode on processing style we controlled for individual differences and subjected both before and after measurements to a 2 (moment of measurement: before or after judging)  $\times$  2 (judgment mode: intuitive or deliberative) repeated measures ANOVA. Overall, participants had a more global processing style before judging poems ( $M = 88.59$ ,  $SD = 136.20$ ) than after judging poems ( $M = 39.90$ ,  $SD = 95.41$ ,  $F[1, 71] = 16.72$ ,  $p < .001$ ,  $\eta_p^2 = .19$ ). The two-way interaction between moment of measurement and judgment was significant ( $F[1, 71] = 8.52$ ,  $p = .005$ ,  $\eta_p^2 = .11$ ). Simple-effects tests revealed that this effect was due to the deliberate condition. The processing style score for participants in the deliberate condition was lower after judging the poems ( $M = 26.86$ ,  $SD = 111.44$ ) than before judging the poems ( $M = 109.51$ ,  $SD = 156.21$ ,  $F[1, 71] = 24.89$ ,  $p < .001$ ,  $\eta_p^2 = .34$ ). No difference was found between processing style scores after ( $M = 53.28$ ,  $SD = 74.76$ ) and before judging the poems ( $M = 67.08$ ,  $SD = 110.11$ ) for participants in the intuitive condition ( $F < 1$ , *ns*). Simple effect analysis revealed that the effect of judgment mode on the "after" score of processing style was not significant ( $F[1, 71] = 1.41$ ,  $p = .24$ ). Processing style scores in the "before" measure differed between the groups in a direction opposite to our hypothesis, although this difference did not reach statistical significance ( $F[1, 71] = 1.79$ ,  $p = .19$ ). Thus, participants in the deliberate condition utilized a more global processing style prior to the manipulation than participants in the intuitive condition. The manipulation caused the processing style scores to change in the predicted direction; scores indicated a local processing style for participants in the deliberate condition. Given the sizeable difference prior to the manipulation, the effect of judgment mode on the "after" measure was only significant when controlling for the "before" measure.

A regression analysis was used to test the effect of processing style on the accuracy score. The processing style score derived from the after-judgment measurement was used as predictor, while the processing style score of the before-judgment measurement was kept constant to control for individual differences. Results showed that processing style predicted the accuracy score ( $F[1, 70] = 8.36$ ,  $p = .005$ ,  $\eta_p^2 = .11$ ,  $\beta = .41$ ). A more global processing style was associated with a more accurate judgment of poetry in comparison to a more local processing style.

When the effects of both processing style scores were kept constant while testing the effect of judgment mode on the accuracy score, judgment mode still predicted accuracy of judgments ( $F[1, 69] = 6.64$ ,  $p = .012$ ,  $\eta_p^2 = .09$ ,  $\beta = .29$ ). However, a Sobel test revealed that the influence of judgment mode on accuracy was significantly reduced ( $z = 1.97$ ,  $p = .049$ ). This indicates that processing style partially mediated the effect of judgment mode on accuracy of quality judgments of poems, see Fig. 1.

<sup>4</sup> Analyses of mean ratings provided additional support. We used a subset of the sample and omitted participants who had recognized poems. The two-way interaction between quality of painting and judgment mode was significant ( $F[1, 60] = 4.05$ ,  $p = .049$ ,  $\eta_p^2 = .06$ ). Participants in the intuitive condition rated published poems as higher quality ( $M = 49.87$ ,  $SD = 12.67$ ) than amateur poems ( $M = 47.25$ ,  $SD = 12.83$ ). In contrast, participants in the deliberate condition rated published poems as lower quality than ( $M = 55.05$ ,  $SD = 9.73$ ) than amateur poems ( $M = 58.79$ ,  $SD = 13.01$ ).

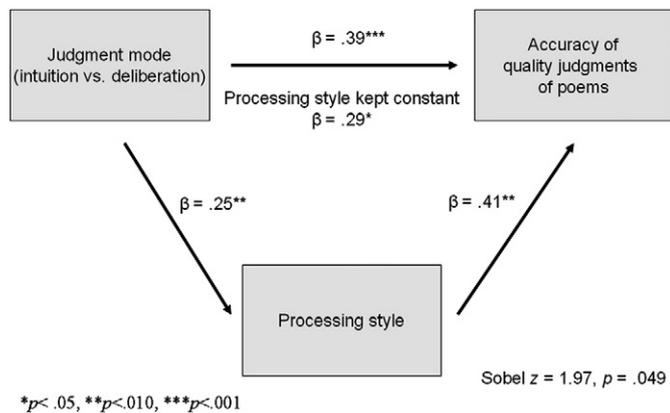


Fig. 1. Mediation of the effect of judgment mode on accuracy of judgments of poems through processing style, controlled for the pre-manipulation measure of processing style.

## General discussion

In three studies, we showed that the effect of deliberating or relying on intuition when judging art (paintings, poems) is affected by processing style. First we showed that judging paintings is affected by deliberation; intuitive judgments turned out to be more accurate than judgments based on reasons (Study 1). Next we showed that natural occurring processing style affects quality judgments (Study 2), and that induced processing style has a similar effect (Study 3). Studies 2 and 3 showed that a more global processing style is related to more accurate judgments of art in terms of quality. In addition we showed that deliberating before judging induces a local processing style; this is not the case when people are asked to rate stimuli intuitively (Study 4). The findings of Study 4 also revealed that processing style partially mediates the effect of deliberating before judging or judging intuitively on judgment of poems.

Ideally mediation is established by demonstrating correlations between variables that are assessed successively in time (independent variable, mediator, dependent variable), which is not the case in Study 4. Assessing the variables for the mediation analysis in this order, however, would have created a rather artificial situation. Participants would be asked to form a deliberated opinion or to rely on their intuition and then to postpone their actual judgment until after the assessment of processing style. In addition, this procedure entails the risk that the measurement of processing style attenuates judgment. We deemed it more important to conduct an unconfounded test of the effect of judgment mode on judgment than to measure the mediator prior to the dependent variable. The studies presented in the present article can be related to each of the steps that determine whether mediation took place or not, described by Baron and Kenny (1986).

Study 1 and 4 demonstrated the causal relation between judgment mode and accuracy of judgment (step 1 in establishing mediation; Baron & Kenny, 1986). Study 4 demonstrated (among others, see above and below) that judgment mode induces processing style (step 2). Study 3 showed that accuracy is affected by processing style (step 3). Finally, Study 4 showed that the effect of judgment mode on accuracy is reduced when processing style is included in the equation. These findings thus indicate that the effect of judgment mode on accuracy of judgment is mediated by processing style, and the outcomes of the mediation analysis reported in Study 4 provide further support.

In our studies we tested the effect of decision mode and processing style in the domain of art. Further research is needed to test whether processing style also explains the detrimental effects of deliberation in other domains, such as judging the quality of jams or predicting sports matches. The fact that we replicated the effect of processing style on judgments of paintings in a study involving judgments of poems indicates that the effect is not limited to the visual

domain, suggesting that similar mechanisms may play a role in other domains.

Overall, our results contribute to the understanding of the effects of deliberating versus relying on intuition in judgments and decisions, and why deliberation might hinder the quality of judgment and choice. As mentioned in the Introduction, other authors have shown that deliberating makes people rely more on accessible information, while attention is directed away from more relevant information (Tordesillas & Chaiken, 1999; Wilson et al., 1995). Processing style as a mediating factor can explain these findings and suggests that the effect of deliberating is more fundamental. Deliberating affects the way in which people attend to, select, and process information in general. However, this does not mean that processing style is the only underlying mechanism of judgment mode. For example, an important feature of deliberation is extended decision time. It is quite possible that extended decision time has detrimental effects on judgments and decisions apart from the effects of processing style. Future research should clarify this issue.

Construal Level Theory (CLT; see Trope & Liberman, 2010) provides additional possible implications of our research. There are many theoretical similarities between CLT and global versus local processing styles (GLOMO<sup>SVS</sup>), and they might in fact refer to the same phenomenon (Förster & Dannenberg, 2010a, 2010b). It could be that both global processing style and increased psychological distance improve judgment and decision-making. For example, imagining that you are making judgments and decisions for future purposes, or for somebody else, could improve decision-making. In addition, the combination of research showing that power increases psychological distance and abstract processing (Smith & Trope, 2006), and research showing that power enables people to make accurate decisions, even after deliberation (Smith, Dijksterhuis, & Wigboldus, 2008), suggests that simply increasing psychological distance enables people to make an accurate decision irrespective of the decision mode.

Another related phenomenon is featural versus configural mindset (Lerouge, 2009). A characteristic of both processing style and mindset is that people either pay attention to details or to the Gestalt. Interestingly, recent research shows that distraction enlarges the effect of mindset (Lerouge, 2009). Individuals in a configural mindset—who are motivated to hold evaluatively coherent representations—become better in differentiating between stimuli, while individuals in a featural mindset—who are motivated to identify specific positive and negative features—are not affected in their evaluation by distraction. This suggests that the beneficial effects of relying on intuition or global processing style are enhanced by distraction. Future research should assess whether this is indeed the case.

Another question for future research concerns the role of expertise. Do experts suffer in the same way from deliberating or adopting a local focus as novices? Or might they be capable of deliberating while maintaining a relatively global focus? Or, alternatively, might they be able to reach accurate decisions in a local focus? Finally, it would be interesting to investigate the effects of decision mode on other domains, such as domains that require decision makers to follow strict rules or on more complex decisions, for instance in policy making and business. Further research can shed more light on these issues, and help people to make optimal use of intuitive versus reasoned judgment and decision-making.

## References

- Albrechtsen, J. S., Meissner, C. A., & Susa, K. J. (2009). Can intuition improve deception detection performance? *Journal of Experimental Social Psychology*, 45, 1052–1055.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Baumeister, R. F. (1984). Choking under pressure: Self-consciousness and paradoxical effects of incentives on skillful performance. *Journal of Personality and Social Psychology*, 46, 610–620.

- Derryberry, D., & Tucker, D. M. (1994). Motivating the focus of attention. In P. M. Niedenthal, & S. Kitayama (Eds.), *Heart's eye: Emotional influences in perception and attention* (pp. 167–196). New York: Academic Press.
- Dodson, C. S., Johnson, M. K., & Schooler, J. W. (1997). The verbal overshadowing effect: Why descriptions impair face recognition. *Memory and Cognition*, 25, 129–139.
- Fazio, R. H. (1990). A practical guide to the use of response latencies in social psychological research. In C. Hendrick, & M. S. Clark (Eds.), *Review of personality and social psychology*, Vol. 11. (pp. 74–97) Newbury Park: Sage.
- Förster, J. (2009). Relations between perceptual and conceptual scope: How global versus local processing fits a focus on similarity versus dissimilarity search. *Journal of Experimental Psychology: General*, 138, 88–111.
- Förster, J., & Dannenberg, L. (2010). GLOMO<sup>SVS</sup>: A systems account of global versus local processing. *Psychological Inquiry*, 21, 175–197.
- Förster, J., & Dannenberg, L. (2010). GLOMO<sup>SVS</sup>: Specifications of a global model on processing styles. *Psychological Inquiry*, 21, 257–269.
- Förster, J., Friedman, R. S., Özelsel, A., & Denzler, M. (2006). Enactment of approach and avoidance behavior influences the scope of perceptual and conceptual attention. *Journal of Experimental Social Psychology*, 42, 133–146.
- Förster, J., & Higgins, E. T. (2005). How global versus local perception fits regulatory focus. *Psychological Science*, 16, 631–636.
- Friedman, R., Fishbach, A., Förster, J., & Werth, L. (2003). Attentional priming effects on creativity. *Creativity Research Journal*, 15, 277–286.
- Gasper, K., & Clore, G. (2002). Attending to the big picture: Mood and global versus local processing of visual information. *Psychological Science*, 13, 34–40.
- Halberstadt, J. B., & Green, J. (2008). Carryover effects of analytic thought on preference quality. *Journal of Experimental Social Psychology*, 44, 1199–1203.
- Halberstadt, J. B., & Levine, G. M. (1999). Effects of reasons analysis on the accuracy of predicting basketball games. *Journal of Applied Social Psychology*, 29, 517–530.
- Kimble, G. A., & Perlmutter, L. C. (1970). The problem of volition. *Psychological Review*, 77, 361–384.
- Langer, E. J., & Imber, L. G. (1979). When practice makes imperfect: Debilitating effects of overlearning. *Journal of Personality and Social Psychology*, 37, 2014–2024.
- Lerouge, D. (2009). Evaluating the benefits of distraction on product evaluations: The mind-set effect. *Journal of Consumer Research*, 36, 367–379.
- Macrae, C. N., & Lewis, H. L. (2002). Do I know you? Processing orientation and face recognition. *Psychological Science*, 13, 194–196.
- Navon, D. (1977). Forest before trees: The precedence of global features in visual perception. *Cognitive Psychology*, 9, 353–383.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231–259.
- Nordgren, L. F., & Dijksterhuis, A. (2009). The devil is in the deliberation: Thinking too much reduces preference consistency. *Journal of Consumer Research*, 36, 39–46.
- Ratcliff, R. (1993). Methods of dealing with reaction time outliers. *Psychological Bulletin*, 114, 510–532.
- Schooler, J. W. (2002). Verbalization produces a transfer inappropriate processing shift. *Applied Cognitive Psychology*, 16, 989–997.
- Smith, P. K., Dijksterhuis, A., & Wigboldus, D. H. J. (2008). Powerful people make good decisions even when they consciously think. *Psychological Science*, 19, 1258–1259.
- Smith, P. K., & Trope, Y. (2006). You focus on the forest when you're in charge of the trees: Power priming and abstract information processing. *Journal of Personality and Social Psychology*, 90, 578–596.
- Tordesillas, R. S., & Chaiken, S. (1999). Thinking too much of too little? The effects of introspection on the decision-making process. *Personality and Social Psychology Bulletin*, 25, 623–629.
- Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, 117, 440–463.
- Veling, H., & van Knippenberg, A. (2004). Remembering can cause inhibition: retrieval-induced inhibition as cue independent effect. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 30, 315–318.
- Westerman, D. L., & Larsen, J. D. (1997). Verbal overshadowing effect: Evidence for a general shift in processing. *The American Journal of Psychology*, 110, 417–428.
- Wilson, T. D., & Dunn, D. S. (1986). Effects of introspection on attitude-behavior consistency: Analyzing reasons versus focusing on feelings. *Journal of Experimental Social Psychology*, 22, 249–263.
- Wilson, T. D., Dunn, D. S., Bybee, J. A., Hyman, D. B., & Rotondo, J. A. (1984). Effects of analyzing reasons on attitude-behavior consistency. *Journal of Personality and Social Psychology*, 47, 5–16.
- Wilson, T. D., Dunn, D. S., Kraft, D., & Lisle, D. J. (1989). Introspection, attitude change, and attitude-behavior consistency: The disruptive effects of explaining why we feel the way we do. In L. Berkowitz (Ed.), *Advances in experimental social psychology*, Vol. 22. (pp. 287–343) New York: Academic Press.
- Wilson, T. D., Hodges, S. D., & LaFleur, S. J. (1995). Effects of introspecting about reasons: Inferring attitudes from accessible thoughts. *Journal of Personality and Social Psychology*, 69, 16–28.
- Wilson, T. D., Kraft, D., & Dunn, D. S. (1989). The disruptive effects of explaining attitudes: The moderating effect of knowledge about the attitude object. *Journal of Experimental Social Psychology*, 25, 379–400.
- Wilson, T. D., Lisle, D., Schooler, J., Hodges, S. D., Klaaren, K. J., & LaFleur, S. J. (1993). Introspecting about reasons can reduce post-choice satisfaction. *Personality and Social Psychology Bulletin*, 19, 331–339.
- Wilson, T. D., & Schooler, J. W. (1991). Thinking too much: Introspection can reduce the quality of preferences and decisions. *Journal of Personality and Social Psychology*, 60, 181–192.
- Yamada, A. (2009). Appreciating art verbally: Verbalization can make a work of art be both undeservedly loved and unjustly maligned. *Journal of Experimental Social Psychology*, 45, 1140–1143.