


# Myside Bias, Rational Thinking, and Intelligence

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## Abstract

Myside bias occurs when people evaluate evidence, generate evidence, and test hypotheses in a manner biased toward their own prior opinions and attitudes. Research across a wide variety of myside bias paradigms has revealed a somewhat surprising finding regarding individual differences. The magnitude of the myside bias shows very little relation to intelligence. Avoiding myside bias is thus one rational thinking skill that is not assessed by intelligence tests or even indirectly indexed through its correlation with cognitive ability measures.

## Keywords

myside bias, rationality, intelligence, reasoning, individual differences

Spearman first reported positive manifold more than 100 years ago, and it is rare when a cognitive process or phenomenon is found to be independent of intelligence. Nevertheless, some recent research has suggested that individual differences in an important critical thinking skill are largely independent of individual differences in intelligence.

So-called myside bias has been amply demonstrated in numerous empirical studies (Taber & Lodge, 2006; Westen, Blagov, Harenski, Kilts, & Hamann, 2006; Wolfe & Britt, 2008). People evaluate evidence, generate evidence, and test hypotheses in a manner biased toward their own prior beliefs, opinions, and attitudes. This is a noteworthy cognitive difficulty, because a recurrent theme in the critical thinking literature is that critical thinkers should be able to decouple their prior beliefs and opinions from the evaluation of evidence and arguments. Myside bias can be viewed as a subclass of confirmation bias (McKenzie, 2004) and is related to the construct of actively open-minded thinking (Baron, 2008).

## Myside Bias Paradigms and Intelligence

Some years ago, Perkins and colleagues (Perkins, 1985; Perkins, Farady, & Bushey, 1991) reported the interesting finding that although intelligence was moderately related to the total number of arguments generated in an argument-generation task, it was substantially less related to

the number of arguments generated that were counter to the subject's own position. This finding lay dormant for many years until a flurry of more recent studies indicated that it was highly replicable and generalizable. In a series of experiments, Klaczynski and colleagues (Klaczynski, 1997; Klaczynski & Lavalley, 2005; Klaczynski & Robinson, 2000) presented subjects with flawed hypothetical experiments that led to either opinion-consistent or -inconsistent conclusions. Klaczynski and colleagues evaluated the quality of the reasoning used when the subjects critiqued the flaws in the experiments. Klaczynski and colleagues found that verbal ability was related to the overall quality of the reasoning in both the opinion-consistent and -inconsistent conditions. However, verbal ability was *not* correlated with the magnitude of the myside-bias effect—the tendency to critique opinion-inconsistent experimental results more harshly than opinion-consistent ones.

In a paradigm more similar to that of Perkins (1985), our research group (Toplak & Stanovich, 2003) had subjects generate arguments relevant to controversial issues (e.g., whether people should be allowed to sell their organs). We also assessed the individuals' opinions on the issues in question. We found a substantial myside

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bias on the task (people tended to give more arguments in favor of their position than against), but the degree of myside bias was not correlated with cognitive ability.

In another study (Sá, Kelley, Ho, & Stanovich, 2005), we looked at the quality of causal reasoning in an informal reasoning paradigm based on the work of Kuhn (1991). We had people tell us their theories about causes of a particular social phenomenon (e.g., criminal recidivism). We then had people give us arguments that supported their theories and arguments that refuted them. The types of evidence that they generated to support their personal theories were scored using protocols similar to those described in the literature on informal reasoning (Kuhn, 1991). For example, evidence types were scored for the quality of causal reasoning. The key finding was that the distribution of argument types was remarkably similar for subjects of high and low intelligence.

Of course, most of the studies discussed here have been run with university subjects, and hence the associations obtained are subject to the restriction of range caveat. Nonetheless, many of the outcomes just discussed were not simply instances of low correlations but, in fact, in several cases were literally zero. It is quite unexpected that, across even the range of ability in a university population, there would be so little relation between myside bias and cognitive ability.

Finally, in other studies (Stanovich & West, 2007, 2008a) we examined argument evaluation performance (as opposed to argument generation). Subjects rated the quality of arguments about abortion (and another issue—lowering the drinking age—that yielded similar results). Arguments were one-sided (all proabortion or all anti-abortion statements) and two-sided (an equal number of pro- and anti-abortion statements). Experts judged the arguments to be approximately equivalent in quality and strength. Consistent with some previous research (Baron, 1995), we found that one-sided arguments were preferred to two-sided arguments (regardless of direction). In addition, a strong myside bias was observed. However, neither of these suboptimal reasoning tendencies was any more common in persons with low IQ than in those with a high IQ.

In an even more naturalistic paradigm, we studied a variety of biased beliefs based on one's societal and demographic status (Stanovich & West, 2007, 2008a). Myside-biased beliefs were rampant: Smokers were less likely to acknowledge the negative health effects of secondhand smoke, people who consumed relatively higher amounts of alcohol were less likely to acknowledge the health risks of alcohol consumption, people who were more highly religious were more likely to think that religiosity led to honesty, people who voted for George W. Bush were more likely to think that the invasion of Iraq made us safer from terrorists compared with those voting

for John Kerry, and so forth. However, we examined not just whether these biases exist (yet another demonstration of myside bias would not be newsworthy), but whether intelligence serves to attenuate the myside bias. We split our very large group of respondents into those of higher cognitive ability and those of lower cognitive ability (although only relatively so; as discussed above, these were university students) to examine the magnitude of the bias within each group. The results were clear-cut. We examined 15 different policy positions on which we found a myside bias. On not one of them was the myside bias smaller in the higher cognitive ability group.

### Why Myside Bias Dissociates From Intelligence

At first glance, these findings on the relative independence of intelligence and myside reasoning biases might seem to contradict other research (some from our own lab, Stanovich & West, 1998) showing that effects such as belief bias in formal reasoning paradigms such as syllogism evaluation (Evans, 2002) are in fact significantly related to intelligence. But there is a critical difference between these experiments and those we have just reviewed that are in the Perkins (1985) tradition: whether the subjects were explicitly and specifically instructed to ignore prior belief and prior opinion in the task. In the formal reasoning studies, in which belief bias effects were associated with cognitive ability, the subjects were explicitly instructed to decouple from their prior beliefs. In contrast, the work with informal reasoning paradigms that we have reviewed here did not sensitize the subject to the necessity of decoupling from prior opinion to perform optimally in the task.

This contrast between the two types of task is illustrated in Tables 1 and 2. The instructions for the syllogistic reasoning task displayed in Table 1 explicitly warn the reasoners to decouple their knowledge about the truth of the premises from their evaluations of logical validity. In essence, they are given an alert to consider the factually incorrect premise of "All things that are smoked are good for the health" as true. The ability to sustain this decoupling will help the subject to arrive at the correct conclusion that this syllogism is actually valid despite the fact that it seems somewhat odd.

In contrast, the instructions for the two informal reasoning tasks displayed in Table 2 contain much less of a warning to the participants that they need to separate their prior opinions from the reasoning process. Example 1 presents the instructions from an argument evaluation task studied by Stanovich and West (2008a) in which the reasoner was asked to evaluate an argument by another person on a very controversial issue—abortion. However,

**Table 1.** Example of a Formal Reasoning Task That Explicitly Instructs Participants to Decouple Prior Belief

In the following problems, you will be given two premises that you must assume are true. A conclusion from the premises then follows. You must decide whether the conclusion follows logically from the premises or not. You must suppose that the premises are all true—even if these statements appear to be false based on your prior knowledge of the world. This is very important. Decide whether the conclusion follows logically from the premises, assuming the premises are true, and indicate your response.

Premises:

- All things that are smoked are good for the health.
- Cigarettes are smoked.

Conclusion:

- Cigarettes are good for the health.

- a. Conclusion follows logically from premises.
- b. Conclusion does not follow logically from premises.

the reasoners are not warned to keep personal opinions about abortion out of their reasoning process. In more technical language, they are not instructed to *decouple* their prior opinion from the evaluation process.

The second example presents the instructions from an argument-generation task studied by Toplak and Stanovich (2003). Here, the participant was told to generate arguments both for and against a stated proposition. Because participants either oppose or favor the proposition, this

**Table 2.** Examples of Informal Myside Reasoning Tasks in Which No Explicit Instruction to Decouple Prior Opinion Is Given

#### Example 1

Instructions for an argument evaluation task used by Stanovich and West (2008a):

In the following task, you will be asked to evaluate the thinking of some students. These students were asked to speak out loud as they reasoned about a particular issue. They were asked to reason as a good reasoner would when trying to arrive at an opinion about the issue. Your task will be to evaluate their thinking. The controversial issue that they were asked to reason about was abortion. Below you see several student responses. You are to rate their reasoning by using the following grade scale.

#### Example 2

Instructions for an argument generation task used by Toplak and Stanovich (2003):

Think through the following issue carefully and feel free to take your time: *The real cost of a university education is \$12,000/year. Students are currently paying approximately \$3500 in tuition. The difference is paid by the taxpayer. University students should pay for the full cost of university education.* Please write down arguments both for and against this position. Try to write as much as you can.

instruction will ensure that the participant generates at least some otherside arguments as well as myside arguments. However, they are not instructed to hold their prior opinion in abeyance and are not explicitly warned that myside bias will be inferred from an imbalance of myside and otherside arguments.

The results discussed previously indicate that positive correlations between bias avoidance and cognitive ability occur in situations typified by Table 1 rather than those exemplified in Table 2. In short, correlations with cognitive ability appear when participants receive explicit instructions to decouple prior belief, which sensitize participants to the fact that decontextualization is a necessary requirement of the task. The correlation occurs because participants of differing cognitive abilities have different levels of computational power available for the override operations that make decoupling possible. This accounts for the correlation between cognitive ability and the magnitude of the belief bias demonstrated in these more formal reasoning situations.

In contrast, the procedure used in the informal reasoning experiments discussed here does not explicitly instruct participants of the need to decontextualize. It might be described as more naturalistic, because rarely in real life (outside of courtrooms) are we under explicit instructions to decouple our prior opinion from the evaluation of evidence. Indeed, the most naturalistic myside paradigms of all assess the myside bias in a between-subjects design. As Kahneman (2000) has argued, “much of life resembles a between-subjects experiment” (p. 682). Table 3 displays a between-subjects myside paradigm that we have employed.

In that study (Stanovich & West, 2008b), we presented one group of subjects with Version 1 of the thought problem displayed in Table 3. Subjects then answered the questions given in the table. We found that there was considerable support for banning the car—78.4% of the sample thought that the German car should be banned, and 73.7% thought that it should not be allowed on the streets like other cars.

The statistics on the dangerousness of the car in the example happen to be real statistics from the years shortly before the study was conducted, but they are the statistics not for a German car but for the Ford Explorer, which happened to be a very dangerous vehicle indeed for the passengers of *other* cars (National Highway Traffic Safety Administration, U. S. Department of Transportation, 2000). In Version 1, subjects were evaluating the social policy of allowing a dangerous German vehicle on American streets. A second group of subjects in our study evaluated the reverse—the policy of allowing a dangerous American vehicle on German streets. This group of subjects received Version 2 of the scenario. Subjects responded on the same scale, and when they did, we found that only 51.4% thought that the Ford Explorer should be banned and only 39.2% thought that it should

**Table 3.** A Between-Subjects Paradigm That Does Not Signal the Need to Avoid a Myside Bias

## Version 1

According to a comprehensive study by the U.S. Department of Transportation, a particular German car is 8 times more likely than a typical family car to kill occupants of another car in a crash. The U.S. Department of Transportation is considering recommending a ban on the sale of this German car.

1. Do you think that the United States should ban the sale of this car?

Definitely	Yes	Yes	Probably Yes	Probably No	No	Definitely No
1		2	3	4	5	6

2. Do you think that this car should be allowed on U.S. streets, just like other cars?

Definitely	Yes	Yes	Probably Yes	Probably No	No	Definitely No
1		2	3	4	5	6

## Version 2

According to a comprehensive study by the U.S. Department of Transportation, Ford Explorers are 8 times more likely than a typical family car to kill occupants of another car in a crash. The Department of Transportation in Germany is considering recommending a ban on the sale of the Ford Explorer in Germany.

1. Do you think that Germany should ban the sale of the Ford Explorer?

Definitely	Yes	Yes	Probably Yes	Probably No	No	Definitely No
1		2	3	4	5	6

2. Should the Ford Explorer be allowed on German streets, just like other cars?

Definitely	Yes	Yes	Probably Yes	Probably No	No	Definitely No
1		2	3	4	5	6

not be allowed on the German streets like other cars. Statistical tests confirmed that these percentages were significantly lower than the proportion of subjects who thought a similar German vehicle should be banned in the United States.

This study demonstrated a sizable myside bias. Subjects believed that a dangerous German vehicle in America was much more deserving of banning than a dangerous American vehicle in Germany. Yet in this study there was absolutely no association between the magnitude of the bias obtained and intelligence. Myside bias in this naturalistic between-subjects design was completely independent of cognitive ability. The subjects above the median intelligence in our sample were just as likely to show such biases as the subjects below the median intelligence in our sample. The research discussed here shows that in a naturalistic reasoning situation, people of high cognitive ability may be no more likely than people of low cognitive ability to *recognize* the need to dampen

myside bias while reasoning. High intelligence is no inoculation against myside bias.

These findings with respect to myside bias are consistent with others in the rational thinking literature indicating that intelligence will be associated with rational thinking tasks that heavily involve some type of inhibition and/or sustained cognitive decoupling—provided the task somehow signals that inhibition is necessary (Stanovich & West, 2008b). In contrast, when people are not warned in advance to avoid biased processing (see Tables 2 and 3) individuals of higher intelligence are often just as likely to engage in biased reasoning as people of lesser intelligence.

### Conclusion: Myside Bias and Rational Thinking

It is important to realize that the avoidance of myside bias is a component of the multifarious concept of

rational thought. It is even more important to realize that rationality is a more encompassing construct than intelligence (Stanovich, 2009).

Given the prominent role that the intelligence construct plays in psychology, it is disconcerting to realize that it is a more restricted concept than rationality. In psychology and among the lay public alike, assessments of intelligence and tests of cognitive ability are taken to be the quintessential measures of good thinking. Critics of these instruments often point out that IQ tests fail to assess many essential domains of psychological functioning (socioemotional abilities, creativity, empathy, etc.). However, even these critiques often contain the unstated assumption that although intelligence tests miss certain key noncognitive areas, they encompass most of what is important cognitively. Recent work on the psychology of rational thinking contradicts this assumption (Kahneman, 2011; Stanovich, 2009). One of the goals of our commentary here is to show a specific example of a rational thinking skill that is missing from intelligence tests.

To think rationally means to adopt appropriate goals, take appropriate action given one's goals and beliefs, and hold beliefs that are commensurate with available evidence. Intelligence tests measure many important things about thinking, but they do not directly assess the degree of rationality of thought. Thus, it is perhaps not surprising that intelligence is quite weakly related to at least some aspects of rational thought. Myside bias turns out to be an aspect of rational thought that, compared with others, is particularly unrelated to intelligence (Stanovich, 2009, 2011).

Myside bias and other rational thinking skills are separable enough from intelligence to constitute a different construct. We are in need of cognitive assessment devices that encompass these skills, and our research group has developed a model for the assessment of rational thinking. The model's major dimensions encompasses such processes as resistance to miserly processing, absence of irrelevant context effects in decision making, overconfidence, myside bias, open-minded thinking, and prudence. Its major dimensions of crystallized knowledge encompass scientific thinking, probabilistic thinking, financial literacy, practical numeracy, superstitious thinking, and functional/dysfunctional personal beliefs. These major components of rational thought have all been operationalized in the empirical literature of cognitive science (Stanovich, 2011). Many have been shown to be linked to important real-world outcomes such as medical decision making, investing, environmental risk analysis, gambling prevention, organ donation, improving the legal system, and pension funding.

### Recommended Reading

Perkins, D. N., Farady, M., & Bushey, B. (1991). (See References). A comprehensive chapter covering the earlier

work using informal reasoning paradigms to investigate myside bias, this chapter also contains one of the earliest reports of the relative independence of intelligence and myside bias.

Stanovich, K. E., & West, R. F. (2008a). (See References). Myside bias is demonstrated in a naturalistic, between-subjects paradigm as well as in a within-subjects paradigm and found to be independent of intelligence in both. An extensive set of references related to myside bias is included.

Stanovich, K. E., & West, R. F. (2008b). (See References). This article presents evidence that a number of additional rational thinking tasks join myside bias in being relatively independent of intelligence.

Taber, C. S., & Lodge, M. (2006). (See References). Although not assessing individual differences, this article describes many ingenious paradigms that can be used to investigate myside bias.

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