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Fast Thought Speed Induces Risk Taking

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Abstract

In two experiments, we tested for a causal link between thought speed and risk taking. In Experiment 1, we manipulated thought speed by presenting neutral-content text at either a fast or a slow pace and having participants read the text aloud. In Experiment 2, we manipulated thought speed by presenting fast-, medium-, or slow-paced movie clips that contained similar content. Participants who were induced to think more quickly took more risks with actual money in Experiment 1 and reported greater intentions to engage in real-world risky behaviors, such as unprotected sex and illegal drug use, in Experiment 2. These experiments provide evidence that faster thinking induces greater risk taking.

Keywords

risk taking, decision making, time perception, thinking

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Some people are risk takers, and others are more conservative. That distinction can differentiate people who take drugs, gamble, and hang glide from people who closely follow the label on their prescription medications and invest their money in certificates of deposit (e.g., Roberti, 2004). People's inclination to take risks is influenced not only by personality but also by circumstances. For example, people tend to take more risks when they are faced with the prospect of heavy losses than when they are faced with the prospect of sizable gains (Kahneman & Tversky, 1979). In the experiments reported here, we explored a different possible source of risk-taking behavior: the momentary pace of one's own thoughts. Thought speed has recently emerged as an important aspect of human thought process, with research showing that fast thinking induces positive mood (Pronin & Jacobs, 2008; Pronin, Jacobs, & Wegner, 2008; Pronin & Wegner, 2006).

A Link Between Thought Speed and Risk Taking

A review of the literature provides some suggestions that fast thinking is linked to risk taking. In almost all cases, people experiencing mania exhibit accelerated thought speed (Goodwin & Jamison, 1990; Young, Abrams, Taylor, & Meltzer, 1983). They also engage in risky behaviors, including reckless goal pursuit and risk seeking in gambling tasks (Clark, Iversen, & Goodwin, 2001; Johnson, 2004; Murphy et al., 2001). Also, stimulants, such as cocaine and amphetamines ("speed"), induce fast thinking (Asghar, Tanay, Baker, Greenshaw, & Silverstone, 2003; Völlm et al., 2004). Moreover, stimulant abusers show elevated risk-seeking behavior (Leland & Paulus, 2005; Paul, Stall, Crosby, Barrett, & Midanik, 1994). In experimental studies, amphetamine intake has been shown to produce feelings of confidence (Asghar et al., 2003) and an inclination to take risks (Hurst, 1962; Killgore et al., 2008).

A potential causal link between thought speed and risk taking has been suggested by studies showing that people faced with time limitations make riskier decisions than people faced with no such limitations. Specifically, people under time pressure show an elevated tendency to make high-stakes gambles that are unlikely to lead to good outcomes (Cella, Dymond, Cooper, & Turnbull, 2007; DeDonno & Demaree, 2008)—an effect that could reflect increases in thought speed caused by time pressure (Ariely & Zakay, 2001).

Our primary hypothesis in this research was that faster thought speed induces greater risk taking. We tested this hypothesis in two experiments. In Experiment 1, participants were induced to read text at a fast or a slow pace before engaging in a risk-taking task in which they could win real money. In Experiment 2, participants watched a video that proceeded at a fast, slow, or moderate pace before reporting their intentions to engage in a variety of risky behaviors and rating the likelihood of positive and negative consequences resulting from those behaviors.

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Experiment 1

Method

Thirty-six university students were randomly assigned to read aloud a series of one-sentence statements of trivia (e.g., "A pilot light continually remains lit in a gas stove"; "In ring toss, players throw a 'hoop' over a 'peg'"). The statements were presented on a computer monitor at either a fast pace (40 ms per letter with 320-ms intervals between sentences; i.e., about half the normal reading speed for this population) or a slow pace (170 ms per letter with 4,000-ms intervals between sentences; i.e., about twice the normal reading speed for this population; see Pronin & Wegner, 2006). To ensure that participants in the two conditions read at the intended speeds, the experimenter surreptitiously listened outside the door to the lab room as the participants read the statements aloud.

Having participants read text aloud at an externally controlled pace is a standard manipulation of thought speed (see Pronin & Jacobs, 2008). The procedure requires participants to process information at a speed that is dependent on the rate at which that information is provided, and thereby ensures participants' active engagement in the experimental manipulation.

After participants had finished reading the text, they reported their thought speed while reading, using a 9-point scale (1 = *very slow*, 9 = *very fast*). They then rated their mood, using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), which measures feelings such as *excited, interested*, and *distressed* on 5-point scales. Scores on the PANAS have been found to be influenced by thought speed (e.g., Pronin et al., 2008; Pronin & Wegner, 2006).

Participants then completed the Balloon Analogue Risk Task (BART; adapted from Lejuez et al., 2002), a behavioral measure of risk taking. In the task, participants inflate a number of computer-simulated balloons one at a time by clicking a pump. Participants control how much they inflate a given balloon by choosing how many times they pump it up; with each pump, the balloon becomes further inflated, and 5¢ is placed in a bank. If a balloon is pumped too many times, it bursts, and the participant loses the contents of the bank. Participants can stop pumping a balloon at any time and lock in the gains earned for that balloon. All participants followed this procedure for 18 different balloons and were allowed to keep all the money they earned during the experiment.

Participants had no information about what factors determined the point at which a given balloon would burst. The number of allowable pumps for each of the 18 balloons was determined randomly (but was constant across participants, following Lejuez et al., 2002), with the constraints that the average balloon burst after 32 pumps and that all balloons burst by 64 pumps.

The BART is designed to capture several important features of everyday risk taking: The probability of positive and negative outcomes is unknown; the relative magnitude of gains decreases with increased risk taking; and the cumulative probability of experiencing a loss increases with increased risk taking. Performance on the BART correlates with engagement in real-life harmful risky behaviors, including drug use, gambling, petty theft, smoking, and unprotected sex (for a review, see Hunt, Hopko, Bare, Lejuez, & Robinson, 2005).

Results and discussion

Participants who were induced to read quickly reported faster thought speed ($M = 6.05$, $SD = 1.84$) than did participants who were induced to read slowly ($M = 4.71$, $SD = 1.72$), $F(1, 34) = 5.10$, $p = .03$, $\eta_p^2 = .13$. In addition, participants who were induced to think quickly rather than slowly took more risks, as indicated by the average number of times they pumped each balloon, regardless of whether the balloon ultimately burst (fast condition: $M = 21.82$, $SD = 5.14$; slow condition: $M = 17.16$, $SD = 5.96$), $F(1, 34) = 5.19$, $p = .03$, $\eta_p^2 = .13$.

Because participants in the fast condition used more pumps to inflate their balloons than participants in the slow condition did, the balloons burst on a greater number of trials in the fast condition ($M = 8.42$, $SD = 2.04$) than in the slow condition ($M = 6.71$, $SD = 2.14$), $F(1, 34) = 6.06$, $p = .02$, $\eta_p^2 = .15$. An analysis (as recommended by Lejuez et al., 2002) that included only trials on which participants did not burst the balloon also revealed that participants in the fast condition showed greater risk taking by pumping balloons more times ($M = 26.56$, $SD = 8.54$) than participants in the slow condition did ($M = 20.60$, $SD = 8.63$), $F(1, 34) = 4.32$, $p = .04$, $\eta_p^2 = .11$ (see Fig. 1).

Participants in the two conditions earned similar amounts of money (fast condition: $M = \$11.98$, $SD = 1.86$; slow condition: $M = \$11.40$, $SD = 2.15$), $F < 1$, because for participants in the fast condition, losses from burst balloons were offset by larger payouts for trials on which the balloons did not burst. Reflecting this pattern of larger payouts but a greater likelihood of bursting balloons and not winning anything, results showed that participants in the fast condition experienced more volatility in monetary returns across trials than did participants in the slow condition, as indicated by a larger mean standard deviation in returns across trials (fast condition: $M = 0.72$; slow condition: $M = 0.59$), $F(1, 34) = 4.09$, $p = .05$, $\eta_p^2 = .11$.

Participants who were induced to think fast reported more positive mood ($M = 2.90$, $SD = 0.75$) than did participants who were induced to think slowly ($M = 2.35$, $SD = 0.59$), $F(1, 34) = 5.71$, $p = .02$, $\eta_p^2 = .14$, a result consistent with previous research. Also consistent with previous research, results revealed no difference in negative mood between conditions, $F < 1$. Mood was unrelated to risk taking, and including it as a covariate in the analyses only increased estimates of effect size.

Thus, participants led to think at a faster pace took more risks than did participants who were led to think more slowly, a result that confirmed our basic prediction. In our next experiment, we sought to further explore this finding.

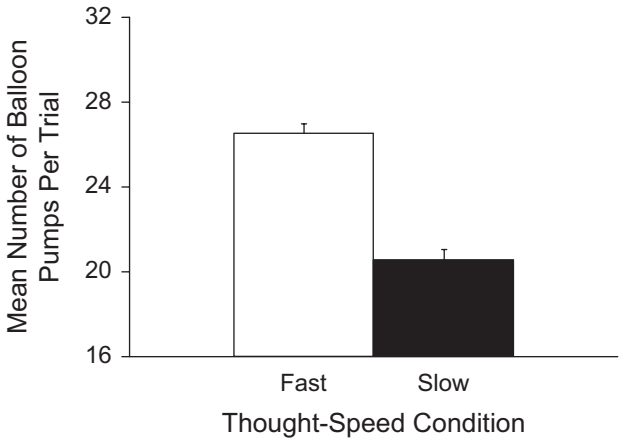

Fig. 1. Results from Experiment 1: risk-taking behavior as a function of thought-speed condition. Risk-taking behavior was assessed using the Balloon Analogue Risk Task (Lejuez et al., 2002), in which greater risk taking is indicated by a greater number of balloon pumps on each trial. Error bars indicate 1 *SE* above the mean.

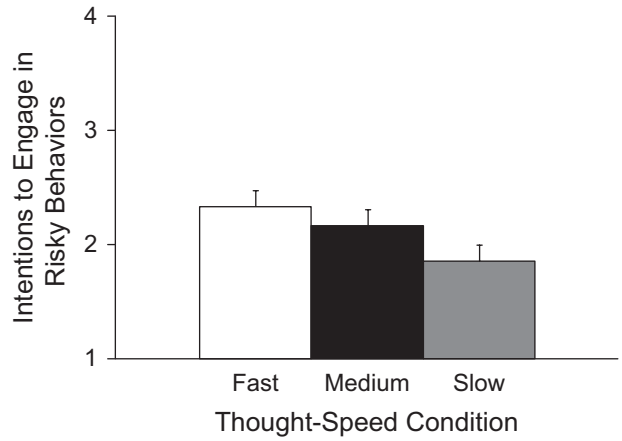

Fig. 2. Results from Experiment 2: intentions to engage in risky behaviors as a function of thought-speed condition. Intentions to engage in risky behaviors were assessed using the Cognitive Appraisal of Risky Events questionnaire (Katz, Fromme, & D'Amico, 2000). Error bars indicate 1 *SE* above the mean.

Experiment 2

In Experiment 2, we used a different measure of risk taking so that we could assess whether the effects of thought speed observed in Experiment 1 generalized to familiar risky behaviors, such as unprotected sex and illegal drug use. We also explored whether fast thinking induces risk taking by increasing individuals' perceptions of potential gains or by decreasing their perceptions of potential losses.

Method

Fifty-two university students were randomly assigned to watch one of three versions of a video that varied in average shot length (ASL), the length of time before the camera switches to a different angle. The fast video had an ASL of 0.75 s (the speed of a typical pop music video), the medium video had an ASL of 1.5 s, and the slow video had an ASL of 3 s (the speed of a typical, but not slow-moving, Hollywood film). Each video contained 3 min of scenes from the film *Baraka* (Magidson & Fricke, 1992) depicting things such as waterfalls, iguanas, and urban landscapes. The three videos were matched for content such that, for example, a 3-s shot of mountains in the slow video was matched with four 0.75-s shots of the same mountains in the fast video. Like the original film, the videos contained no verbal narrative or dialogue. Participants watched the video and then reported their thought speed, using a scale from 0 (*very slow*) to 100 (*very fast*), and their mood, using the PANAS (Watson et al., 1988).

Next, participants completed a 23-item version of the Cognitive Appraisal of Risky Events questionnaire (CARE; Katz, Fromme, & D'Amico, 2000). Using 7-point scales (1 = *not at all likely*, 7 = *extremely likely*), they rated how likely they were to engage in various risky behaviors during the next 6 months (α = .76), as well as each behavior's likelihood of yielding positive (α = .91) and negative (α = .89) consequences. The risky behaviors on the questionnaire included smoking marijuana, playing drinking games, having unprotected sex, damaging public property, and putting off assignments until the last minute. Intentions reported on the CARE have been shown to predict future risk-taking behavior (Fromme, Katz, & Rivet, 1997; Katz et al., 2000).

Results and discussion

Effects of the video manipulation were analyzed in a regression analysis with ASL as the predictor. Participants in the fast condition reported thinking fastest (M = 59.88, SD = 19.45), followed by participants in the medium condition (M = 46.82, SD = 18.87), and then participants in the slow condition (M = 40.94, SD = 16.73), $\beta = -0.37$, $t(50) = 2.84$, $p = .006$. In addition, participants in the fast condition reported the greatest intentions to take risks during the next 6 months (M = 2.34, SD = 0.72), followed by participants in the medium condition (M = 2.17, SD = 0.47), and then participants in the slow condition (M = 1.86, SD = 0.50), $\beta = -0.34$, $t(50) = 2.55$, $p = .01$ (see Fig. 2).

Participants in the fast condition reported the lowest perceptions that risky behavior would have negative consequences (M = 5.48, SD = 0.64), followed by participants in the medium condition (M = 5.63, SD = 0.86), and then participants in the slow condition (M = 6.02, SD = 0.80), $\beta = -0.29$, $t(50) = 2.15$, $p = .04$. The anticipated likelihood of positive outcomes from risky behavior did not differ by condition (fast: M = 1.98, SD = 1.99; medium: M = 2.23, SD = 1.21; slow: M = 2.18, SD = 1.09), $t < 1$.

We next examined whether the effect of thought speed on risk taking was mediated by reduced perceptions of the negative consequences of risk taking. The effect of thought speed

on risk taking, $b = -0.20$, $t(49) = 2.36$, $p = .02$, became nonsignificant when perceived negative consequences were included in the model, $b = -0.12$, $t(49) = 1.49$, $p = .14$.[1] Further, using the bootstrapping method advocated by Preacher and Hayes (2008), we found that the indirect effect of thought speed on risk taking, through perceived negative consequences, was significant, with a point estimate of 0.08 and a 95% bias-corrected and accelerated bootstrap confidence interval (see Efron, 1987) of 0.014 to 0.18.

Thought speed tended to predict positive mood, though not significantly, $\beta = 0.20$, $t(49) = 1.46$, $p = .15$. Positive mood was highest in the fast condition ($M = 3.10$, $SD = 0.50$), followed by the medium condition ($M = 2.79$, $SD = 0.63$), and then the slow condition ($M = 2.77$, $SD = 0.60$). Positive mood was unrelated to risk taking, and including positive mood in the mediational analysis did not change the strength of the indirect effect.

In sum, faster thought speed induced greater intentions to take risks. This effect was mediated by reduced perceptions of the negative consequences of risky behavior.

General Discussion

The results from our two experiments demonstrate a causal link between thought speed and risk taking. In Experiment 1, a reading-rate manipulation influenced risk-taking behavior in a task involving actual monetary rewards. In Experiment 2, a video-speed manipulation influenced intentions to engage in real-world risky behaviors, an effect that was mediated by perceptions of the negative consequences of risky behavior. These findings are consistent with prior theorizing suggesting that fast thinking signals a need for urgent action and may thereby encourage bold behavior and discourage people from pausing to contemplate the negative consequences of their actions (Pronin & Jacobs, 2008).

Our findings, together with prior evidence that fast thinking elevates mood, suggest that thought speed is a fundamental determinant of human emotion and behavior. Extensive research has focused on the consequences of thought content—what people think—for human experience. The present research suggests that another aspect of thought—how people think and, in particular, the speed of that thought—also has important consequences.

Our results have several practical implications. Treatments designed to slow thought in manic patients could reduce their tendency toward harmful risk taking. For people in general, the pace of modern life sometimes seems to be getting faster and faster. Regardless of whether or not this is true, our research suggests that variations in the pace of the stimuli that people encounter in everyday life can speed thinking and thereby heighten risk-taking intentions and behavior. In the context of a high-stakes situation, such as a military battle, decision makers' proneness to make risky decisions may be influenced by the speed with which they can access information. On a typical workday, the risks employees take in pursuing new projects may be affected by whether they begin the day by slowly perusing their e-mails or racing through them. Finally, the movies people watch today are moving at a faster pace than ever (Bordwell, 2002; Cutting, DeLong, & Brunick, 2011). Some parents and policymakers are concerned about the racy content (e.g., eroticism, violence) of the movies, videos, and Internet communications to which children are exposed. Our research suggests that adults are right to worry—but that the problem may involve a different kind of "raciness" entirely.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Note

1. Following convention (see Preacher & Hayes, 2008), we conducted mediation analysis using unstandardized coefficients, even though standardized coefficients are reported elsewhere in the article.

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