

Flexible Control: Conflict Mindsets Reduce the Association Between Trait Measures of Self-Control Decision-Making and Delay Discounting

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People experience conflicts between goals, thoughts, and actions on a regular basis. Those conflict experiences can trigger a *conflict mindset*, a unique information processing style characterized by the activation and consideration of conflicting alternatives. This processing style has been associated with a reduced reliance on dominant or default response tendencies. It could, therefore, affect self-control decisions, in which in order to receive a larger delayed reward (e.g., good health) people need to forego a smaller immediate reward (e.g., tasty pizza). Importantly, the tendency to choose the delayed over the immediate reward varies between individuals, with people scoring low on trait impulsivity (or high on trait self-control) showing an overall stronger tendency to forgo the immediate reward. In three studies ($N_{\text{total}} = 480$) we tested the effect of a conflict (vs. neutral) mindset on people's repeated choices for smaller immediate over larger delayed rewards in a delay discounting task. A fully powered analysis across all three studies supported the notion that a conflict mindset reduced the influence of dispositional "default" response tendencies on self-control decisions: participants' trait impulsivity and self-control scores predicted delay discounting only in the neutral mindset condition. In the conflict mindset condition, those dispositional tendencies and delay discounting were unrelated. This finding extends previous work on conflict mindsets by showing that they can reduce the association between individual differences and behavior.

Keywords: conflict mindset, delay discounting, impulsivity, self-control, flexibility

Feeling conflicted is part of our daily life (Hofmann et al., 2012). Conflicts may arise when deciding what job or university to apply to (weighing prestige vs. distance to home), when choosing between the healthier salad or the tastier pizza for dinner, or when trying to find the right work-life balance. In those situations at least two conflicting goals and choice alternatives are simultaneously activated and considered. Several lines of research within psychology suggest that the experience of such conflicts influences information processing and behavior (Botvinick et al., 2001; Kleiman & Hassin, 2013). Effects not only occur when the conflict is experienced (e.g., Botvinick et al., 2001; Dreisbach & Fischer, 2012), but can also be observed in subsequent, even unrelated situations (Becker et al., 2019; for an overview see: Kleiman & Enisman, 2018; Sassenberg et al., 2022). One explanation of those carry-over effects is the activation of a *conflict mindset*. The general notion in the

mindset literature is that conflict mindsets reduce the reliance on dominant preferences or response tendencies and thereby increase flexibility of thoughts and behavior (e.g., reduced confirmation bias; for reviews see Kleiman & Enisman, 2018; Sassenberg et al., 2022).

The present studies test the effect of a conflict mindset on self-control decision-making. More specifically, on people's preference for smaller immediate over larger delayed rewards (i.e., delay discounting; Odum et al., 2020; Richards et al., 1999). Taking a person \times situation interaction approach (see Bem & Allen, 1974; Mischel et al., 2002), we predict that people's preferences in self-control decisions are influenced by their dispositional tendencies (e.g., trait impulsivity and self-control) and that this influence is mitigated when a conflict mindset is activated. To be more precise we test the prediction that individual differences in people's trait impulsivity and self-control will predict delayed discounting in a control condition (e.g., de Wit et al., 2007; Kirby et al., 1999), whereas this association will be reduced in a conflict mindset condition. By that, we go beyond existing conflict mindset research not only by showing the effect of conflict mindsets for the first time in the context of self-control decision-making, but also by investigating their moderating impact on the association between supposedly stable interindividual differences and concrete self-control behavior.

Conflict Mindsets Impact Information Processing

A conflict mindset arises when two or more contradicting alternatives are simultaneously activated and considered. Those alternatives

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can, for example, be goals or choice alternatives, but also thoughts or other internal states. The experience of such an internal conflict then evokes a unique information processing strategy that is characterized by the very nature of the conflict: the activation and consideration of conflicting alternatives (Kleiman & Enisman, 2018). Once triggered, this specific information processing style remains activated, which means that it can influence subsequent information processing through acting as a procedural prime. As with other mindsets, what carries over to the next situation is not the content of the initial conflict experience, but merely the cognitive procedure of considering alternatives (e.g., Galinsky & Moskowitz, 2000; Sassenberg et al., 2017). Typical manipulations that evoke a conflict mindset ask participants to remember and write down a past situation in which two important goals were in conflict (Alquist et al., 2018; Stern & Kleiman, 2015), or activate the conflicting goals (e.g., study vs. party goal) by means of priming (Kleiman & Hassin, 2013; Savary et al., 2015).

The literature to date suggests that this specific cognitive procedure evoked by the conflict mindset subsequently manifests in people's reduced reliance on dominant or default response tendencies (for a review see Sassenberg et al., 2022). For example, studies show that a conflict mindset reduces the influence of stereotypes and prejudices on people's judgment (Stern & Kleiman, 2015; Winter et al., 2021), reduces people's tendency to search for and process information that is in line with their views (confirmation bias; Kleiman & Hassin, 2013), and reduces people's reliance on strong preferences (e.g., defer or postpone a conflicting choice; Savary et al., 2015). To illustrate, Savary et al. (2015) found that instead of deferring a conflicted choice, which people are naturally inclined to do, participants in a conflict (vs. neutral) mindset gathered more information during the decision-making process and were more likely to resolve conflicting choices. Similarly, people's general tendency to act competitively in a competition context was reduced when a conflict mindset was activated (Landkammer & Sassenberg, 2016). And finally, a conflict mindset has also been associated with enhanced creativity and thinking in broader categories, again suggesting greater deviation from the "trodden path" (Kleiman et al., 2016; Miron-Spektor et al., 2011).

Conflict Mindsets Impact Self-Control Decision-Making

One domain in which overcoming default response tendencies can play a role is self-control decision-making. By definition, self-control decisions entail a trade-off between enacting a short-term, often hedonic, goal that promises an immediate reward (e.g., eating the tasty pizza for enjoyment now) and enacting a long-term goal that promises a delayed reward (e.g., eating salad to achieve or maintain good health in the future). Even though immediate rewards in and of themselves have a strong "motivational pull," partly through mechanisms of delay discounting (i.e., the overall tendency to ascribe less value to delayed outcomes; Odum, 2011), this pull is not equally strong for everyone. As research on individual differences in self-control decision-making shows, individuals scoring low on trait impulsivity show a weaker behavioral tendency for immediate over-delayed rewards during self-control decision-making compared to individuals scoring high on impulsivity. This is reflected, for example, in the finding that less impulsive people have smaller discounting rates in the delay discounting task (DDT; e.g., de Wit et al., 2007; Kirby et al., 1999). Similarly, individuals

high in trait self-control experience weaker desires and fewer temptations which suggests a stronger behavioral tendency for delayed over immediate rewards relative to those low in trait self-control (Hofmann et al., 2012). In that respect, measures of trait impulsivity and trait self-control both capture people's dispositional tendency regarding their preference for immediate over delayed rewards (with opposite signs).

In previous research conflict mindsets have been shown to increase flexibility and thereby to reduce the influence of default tendencies, such as the confirmation bias, on behavior (Kleiman & Hassin, 2013). In the context of self-control decisions, people's default can best be understood as individual differences in their dispositional tendency to choose the smaller immediate over the larger delayed reward. Acknowledging those individual differences, conflict mindsets will probably not have a uniform effect on self-control decision-making (e.g., everyone becomes less oriented toward the smaller immediate reward), but will interact with those individual differences (Kleiman & Enisman, 2018; Sassenberg et al., 2022). Because a reduced influence of dispositional tendencies on behavior means that we expect *relative shifts* or a mitigation, rather than complete reversals of response tendencies, we expect people's dispositional tendencies to be less predictive of their self-control decisions when they are in a conflict mindset. Concretely, people whose dispositional tendency favors the smaller immediate reward (high impulsivity/low self-control) should on average show a *relative* shift in preference from smaller sooner to larger delayed rewards. People whose dispositional tendency favors the larger later reward (low impulsivity/high self-control) should on average show a *relative* shift in preference toward smaller immediate rewards.

Most existing studies do not explicitly test the interaction of a conflict mindset manipulation with individual differences. This makes sense in studies looking at basic behavioral biases (e.g., confirmation bias) which are assumed to apply to the majority of individuals, or in studies that use a strong situational manipulation to strengthen one specific response tendency (e.g., time pressure; Alquist et al., 2018). There are, however, also studies supporting the idea that the effect of a conflict mindset on people's judgments is a function of their dispositional tendencies. For example, a line of studies by Winter et al. (2021) showed that participants' pre-measures of trust toward a specific social group (e.g., refugees) predicted post-measures of trust most strongly in the control group. This relationship was much weaker or absent in the condition in which a conflict mindset was evoked in between the two measurements (for similar findings see Rothman et al., 2022; Winter et al., 2022). Specifically, in the conflict condition, people with low pre-measure trust showed a shift toward relatively higher post-measure trust, whereas people with high pre-measure trust showed a shift toward relatively lower post-measure trust. Their pattern of results suggests that processing conflicts subsequently reduced participants' reliance on pre-existing judgments.

Based on the assumption that a conflict mindset is associated with less reliance on dispositional behavioral tendencies (Kleiman & Enisman, 2018; Sassenberg et al., 2022; Winter et al., 2021), we hypothesize that participants' trait scores predict self-control decisions only (or to a stronger extent) in the neutral mindset (i.e., control) condition. In the condition in which a conflict mindset is evoked, we predict that this relationship is significantly reduced or absent (*flexibility hypothesis*). Importantly, here in the context of the DDT, we assume that both measures of trait impulsivity and

trait self-control capture people's dispositional tendency regarding their preference for immediate over delayed rewards (with opposite signs). The analyses are thus complementary and can also be seen as conceptual replications of each other.

Overview of the Studies

We conducted three studies in total to test the effect of a conflict (vs. neutral) mindset on a key aspect of self-control decision-making, namely people's preference for a smaller immediate over a larger delayed reward. We measured this preference with the validated and often used delay discounting task (Odum et al., 2020; Richards et al., 1999). A stronger preference for immediate (vs. delayed) rewards is seen as an indicator of higher impulsivity and lower self-control (de Wit et al., 2007; Kirby et al., 1999). All three studies were pre-registered (https://researchbox.org/517&PEER_REVIEW_passcode=NDJKTW). However, over the course of the studies our insights into the effect as well as the proposed analyses changed. Initially, we expected a conflict mindset to uniformly *reduce* people's preference for delayed rewards (see footnote for explanation behind our hypothesis¹; cf. Alquist et al., 2018). Based on findings in Studies 1 and 2, we, however, adjusted our pre-registered analyses in Study 3 to also include the interaction term between the mindset condition and the individual difference measure to test the predicted flexibility hypothesis.

To test whether the *flexibility hypothesis* receives the most empirical support across all three studies, we decided to conduct and present a fully powered merged analysis. We did this (a) because all studies are almost identical in terms of design and measures (differences are highlighted in the methods section), (b) because merging the three studies increases our statistical power to detect the effect of interest (total $N = 480$). The sample size for each study was determined before any data analysis. We assumed a small to medium effect size of $d = 0.4$, a power of 0.8, and an alpha of .05, which meant a required sample size of 200 participants per study. A sensitivity analysis (G*Power) indicated that the combined sample size ($N = 480$) is sufficient to detect effects of small size for a single regression coefficient in a multiple regression with 3 to 5 predictors (at 80% power $f^2 = .01$, at 95% power $f^2 = .03-.04$). And (c) because we wanted to be transparent as well as efficient in presenting all studies we conducted to test the effect of a conflict mindset on delay discounting in one paper (i.e., no additional studies exist).

All deviations from the original pre-registrations (including one additional measure in Studies 2 and 3 which is not reported here²) are summarized in an openly accessible document (https://researchbox.org/517&PEER_REVIEW_passcode=NDJKTW). Besides those deviations, we report all measures, manipulations, and exclusions. The line of experiments was approved by the local ethical committee (LEK 2017/006).

Method

Participants

In Study 1, we recruited 174 participants via the institutions' recruitment platform (see Table 1 for demographic information of all three samples). The study was conducted in the lab and participants were randomly assigned to either the conflict ($n = 85$) or the neutral mindset condition ($n = 89$). Their participation was rewarded with 8 euros. In Study 2, we recruited 184 participants in the Mensa

Table 1
Sample Characteristics, Descriptives, Reliabilities, and Manipulation Check for Studies 1–3

Characteristics	Study		
	1	2	3
Gender (F/M/other)	127 / 31 / 1	89 / 70 / 0	113 / 49 / 0
Age M (SD)	22.71 (3.08)	22.33 (5.49)	22.65 (3.22)
Impulsivity α	.80	.77	.76
Conflict mindset M (SD)	2.11 (0.29) ^a	2.15 (0.38) ^a	2.04 (0.25) ^a
Neutral mindset M (SD)	2.07 (0.30) ^a	2.21 (0.42) ^a	2.10 (0.30) ^a
Self-control α	n/a	.82	.80
Conflict mindset M (SD)	n/a	3.11 (0.65) ^a	3.13 (0.67) ^a
Neutral mindset M (SD)	n/a	2.98 (0.61) ^a	3.00 (0.57) ^a
Manipulation check			
Conflict mindset M (SD)	72.69 (18.84) ^a	64.14 (23.65) ^a	70.10 (26.45) ^a
Neutral mindset M (SD)	15.13 (22.33) ^b	22.04 (26.28) ^b	38.13 (26.21) ^b
Need for money			
Conflict mindset M (SD)	66.61 (30.58) ^a	44.60 (31.62) ^a	67.56 (29.35) ^a
Neutral mindset M (SD)	62.94 (29.82) ^a	40.10 (28.67) ^a	60.73 (29.18) ^a

Note. Differences between conditions within each study are indicated by superscripts. Numbers with different superscript across two rows are significantly different at $p < .05$.

building of the University of Tübingen (Germany). Participants were approached by research assistants and asked if they were interested in participating in a study that would take approximately 15 min to complete and for which they would get a small present (chocolate bar or bag of fruit gum). Participants were randomly assigned to either the conflict mindset condition ($n = 90$) or the neutral mindset condition ($n = 93$; the data file of one participant was lost due to technical problems). Study 3 was also conducted in the laboratory and advertised via the institutions' recruitment platform. The 184 participants were randomly assigned to the conflict ($n = 94$) or the neutral mindset condition ($n = 90$). Participants were rewarded with 8 euros. Care was taken that no one participated in more than one of the studies.

We pre-registered three exclusion criteria. First, a research assistant checked the data on whether participants followed the instructions for the mindset manipulation. The following participants were excluded: participants in the conflict mindset condition who

¹ At the start of this research project, we had formulated the hypothesis that a conflict mindset would uniformly lead to a stronger preference for immediate rewards. This hypothesis was based on evidence suggesting that a previous experience of conflict makes people better prepared to deal with upcoming conflict (Kerns et al., 2004). As a consequence, the conflict experience may be less "intense," or "sting less." Given that an intense conflict experience is related to more control efforts (Inzlicht et al., 2015; Kroese et al., 2011; Myrseth & Fishbach, 2009), we hypothesized that a conflict mindset would reduce subsequent self-control. Over the course of the project, our hypothesis was updated to the flexibility hypothesis, mainly because of new incoming evidence from the presented work but also from simultaneous developments in the field (Sassenberg et al., 2022; Winter et al., 2021).

² Studies 2 and 3 included one additional measurement each, which were part of the pre-registration but which are not reported here. In Study 2, we also administered a short questionnaire, in which participants had to make six hypothetical self-control choices. In Study 3, we also obtained a measurement of conflict intensity regarding the practice trials of the DDT (pre-DDT conflict intensity). For more elaboration on those measures and why we do not report them, please see the document in the online supplemental materials on deviations from the pre-registration here: https://researchbox.org/517&PEER_REVIEW_passcode=NDJKTW.

did not describe a conflict (Study 1 $n = 3$; Study 2 $n = 3$; Study 3 $n = 2$) and participants in the neutral mindset condition who described a conflict (Study 1 $n = 1$; Study 2 $n = 2$; Study 3 $n = 8$). We also excluded participants for whom in the delay discounting task not all 5 points of indifference were obtained, as they are necessary to calculate the parameters (Study 1 $n = 11$; Study 2 $n = 15$; Study 3 $n = 13$). And participants who at the end of the experiment indicated that their data should not be used for analyses (Study 1 $n = 0$; Study 2 $n = 2$; Study 3 $n = 0$). For characteristics of the subsamples, including demographics see Table 1. The final sample for the merged analysis consisted of 480 participants (329 female, 152 male, one other; $M_{\text{age}} = 22.56$, $SD = 4.07$).

Materials and Procedure

If not explicitly mentioned otherwise, materials and procedures were identical in all three experiments. After signing informed consent participants completed the *mindset manipulation*. Here, we used the same retrospective memory procedure that had been successfully used to induce a conflict (or neutral) mindset in previous work (Stern & Kleiman, 2015). Participants in the conflict mindset condition were asked to remember and write down a situation in their lives in which two goals which were important to them, were in conflict. Examples of what participants came up with are: choosing to go on a gap year abroad or staying with a partner, choosing between a close university to stay with family and friends or a more distant (and better or more fitting) university. In Studies 1 and 2, participants in the neutral mindset condition were asked to write down what they did this morning, whereas in Study 3, we asked participants in this condition to write down a situation in their lives in which they pursued a goal which was important to them and which was easy to achieve. This alteration was applied to render the neutral condition more similar to the experimental condition (i.e., it also includes goal striving but without a conflict). To ensure that the mindsets remained active throughout the task, we asked participants to keep this situation in mind throughout the task, because we would later ask questions about it (Stern & Kleiman, 2015).

Next, participants started the *Delay Discounting Task* (DDT; Richards et al., 1999), which provided the main dependent variable. In the DDT, participants were presented with a series of individual questions that were all of a similar format: “Do you want X euro now, or 10 euro in Y days?” X was the amount of immediately available money and could vary between 0 and 10 euros (in increments of 0.50 euro). Y was the delay after which participants could receive the alternative 10 euros. In Study 1, these delays were 0, 2, 30, 180, or 365 days. In Studies 2 and 3, these delays were 2, 7, 30, 180, or 365 days. We changed the first two delays for Studies 2 and 3 because participants in Study 1 voiced confusion about the 0-day delay questions. For each question, participants indicated their choice between the immediate and delayed amount with a mouse click on the corresponding button on the screen.

The present DDT used an adjusting-amount procedure (Richards et al., 1999) in which participants’ previous responses influence the range of possible immediate amounts presented in the following trials. The precise algorithm of how immediate amounts are determined for successive trials can be obtained in the original article by Richards et al. (1999). Importantly, the algorithm allowed to effectively determine a point of indifference (POI) for each delay. The POI refers to the amount of immediately available money X

that is judged as equally valuable as 10 euros at a specific delay Y. In other words, the POI represents the subjective value of the delayed reward (e.g., 8 euros now is worth as much as 10 euros in 7 days) and marks the moment at which the participant has no clear preference for the immediate or delayed reward. Higher POIs signal a greater willingness to wait for a delayed reward. Once a POI for a specific delay Y had been determined, no more additional trials for this specific delay were presented.

We pre-registered two indices of participants’ overall tendency to discount delayed rewards: the area under the curve (AUC) and the k-parameter. Both indices are widely used in the literature and produce similar results in normal populations (Odum et al., 2020; Yoon et al., 2017). But because the k-parameter takes into account that delayed rewards are discounted hyperbolically (Mazur, 1987; Reed et al., 2012), and because the results for the AUC were identical to the results for the k-parameter ($r = -.96$, $p < .001$), we decided to only present the latter. The k-parameter represents the steepness of a non-linear regression “discounting” curve and is calculated with the following formula:

$$V = \frac{A}{1 + kD} \quad (1)$$

where V is the subjective value (POI) of a delayed reward A (10 euro) at a given delay D. The higher the k-parameter, the stronger the preference for immediate rewards.

Participants completed several additional measures after the DDT. Information about the reliability of those measures for each study can be found in Table 1. To measure their trait level of *impulsivity*, participants filled in the German version of the Barrett Impulsiveness scale (Hartmann et al., 2011; Patton et al., 1995). In Studies 1 and 3, we used the long version with 30 items. In Study 2, we used the short version with 15 items (BIS-15; Spinella, 2007). Example items are “I plan tasks carefully” and “I act on impulse.” Answers were given on a 4-point scale (1: *rarely/never*, 2: *occasionally*, 3: *often*, 4: *almost always/always*). Higher averaged scores indicated stronger impulsivity.

In Studies 2 and 3, we also measured participants’ trait *self-control* (Tangney et al., 2004). Using the shortened version, participants read 12 statements (e.g., “I am good at resisting temptations,” “I am lazy”) and were asked to indicate the degree to which they applied to them a 5-point scale, ranging from 1 (*not at all applicable*) to 5 (*very much applicable*). Higher averaged scores indicated more self-control.

In Study 3, we included additional measures to investigate potential explanations and confounds. Specifically, we measured how much conflict participants experienced while making decisions in the DDT, their current affect and the perceived effortfulness of the mindset manipulation. Perceived *conflict intensity* during the DDT was measured after the DDT with 4 self-constructed items (e.g., “How difficult was it for you to answer the questions,” “When answering the questions I felt decisional conflict,” $\alpha = .89$) and responses were given on 9-point scales with higher numbers reflecting more agreement. Higher average scores reflecting more experienced conflict. Current *affect* was measured with two slider items, one measuring positive affect (“How positive do you feel right now?” 0: neutral–100: positive) and one measuring negative affect (“How negative do you feel right now?” 0: neutral–100: neutral). The perceived effortfulness of the mindset manipulation was

measured with 3 items (e.g., “How effortful was it to write about the situation?” $\alpha = .84$). Responses were given on sliders with a range of 0 (*not at all*) to 100 (*very much so*), with higher scores reflecting higher effortfulness.

At the end of each experiment, participants reported their demographic information and answered additional questions. One was a manipulation check question (“Please think back to the situation you described at the beginning of this task. How much conflict did you experience during the situation you described?”) and participants gave their responses on a slider ranging from 0 (*no conflict*) to 100 (*strong conflict*). The other question asked participants to indicate their agreement with the statement “I currently need money” on a slider ranging from 0 (*I do not agree*) to 100 (*I totally agree*). Finally, participants were informed about the goal of the study and were asked whether they allow us to use their data for analyses.

Results

We first tested whether our manipulation worked. As intended, participants in all three studies reported higher levels of conflict during the situation described in the manipulation phase in the conflict mindset condition compared to the neutral mindset condition (all $t_s > |7|$, see Table 1). This suggests that the manipulation was successful. Moreover, participants’ current need for money did not differ across conditions (all $t_s < |1.5|$, see Table 1).

Delay Discounting Task

Before testing our hypotheses, we checked whether the k estimates were normally distributed. Because values of k parameters were highly positive skewed, we applied the standard procedure and log-transformed them prior to our analyses (see pre-registration Study 3; Yoon et al., 2017). To test our hypotheses, we compared people’s behavior in the DDT (log-transformed k -parameter; $M = -5.50$, $SD = 2.14$) between the two conditions, taking into account their individual differences in a) impulsivity or b) self-control, controlling for Study (1 vs. 2 vs. 3). The separate results from the regression analyses per study can be found in Table 2. Both individual difference measures are often seen as polar opposites of each other, which is why they usually correlate negatively. This was also the case in the present study ($r = -.61$, $p < .001$). Since we preregistered both measures, we conducted two analyses, which can however be seen as conceptual replications of each other. The data on which the analyses are based can be found here (https://researchbox.org/517&PEER_REVIEW_passcode=NDJKTW).

Trait Impulsivity

The first analysis was a multiple regression analysis with mindset condition (conflict = 1 vs. neutral = -1; effect-coded) and impulsivity (continuous, grand mean-centered) predicting participants’ log-transformed k -parameter, controlling for a main effect of study (dummy coded).³

The model was significant, adjusted $R^2 = .03$, $F(5, 474) = 4.22$, $p < .001$. There was no main effect of condition, $B = 0.15$, $SE = 0.10$, $\beta = .07$, $t(474) = 1.51$, $p = .131$, 95% CI of B [-0.04, 0.33]. There was, however, a main effect of impulsivity, $B = 0.81$, $SE = 0.30$, $\beta = .13$, $t(474) = 2.75$, $p = .006$, [0.23, 1.39]. In support of the flexibility hypothesis, the interaction term was also significant,

$B = -0.72$, $SE = 0.29$, $\beta = -.11$, $t(474) = -2.47$, $p = .014$, [-1.30, -0.15]. Simple slope analyses showed that while impulsivity positively predicted participants’ k -parameter in the neutral mindset condition, $B = 1.54$, $SE = 0.40$, $t(474) = 3.89$, $p < .001$, [0.76, 2.31], both measures were unrelated in the conflict mindset condition, $B = 0.09$, $SE = 0.44$, $t(474) = 0.21$, $p = .840$, [-0.77, 0.11] (see Figure 1).

We additionally conducted the alternative contrast analysis, comparing the two conditions at high ($M + 1SD = 2.44$) and low ($M - 1SD = 1.78$) levels of impulsivity. The conditions differed at low levels of impulsivity, $B = 0.38$, $SE = 0.14$, $t(474) = 2.82$, $p = .005$, 95% CI of B [0.12, 0.65], but not at high levels of impulsivity, $B = -0.09$, $SE = 0.14$, $t(474) = -0.69$, $p = .491$, [-0.36, 0.17].

Trait Self-Control

A similar analysis was conducted with self-control as individual difference measure. The self-control scale was only administered in Studies 2 and 3, which is why sample size differs for those analyses. The findings mirror the results for impulsivity. The overall model predicting participants’ k -parameter was significant, adjusted $R^2 = .03$, $F(4, 316) = 3.24$, $p = .013$. The main effect of mindset condition was not significant, $B = 0.04$, $SE = 0.12$, $\beta = .02$, $t(316) = 0.36$, $p = .722$, 95% CI of B [-0.19, 0.28]. The main effect of trait self-control was significant, $B = -0.50$, $SE = 0.19$, $\beta = -.15$, $t(316) = -2.60$, $p = .010$, [-0.86, -0.12]. Importantly, the interaction between condition and self-control was also significant, $B = 0.49$, $SE = 0.19$, $\beta = .14$, $t(316) = 2.54$, $p = .011$, [0.11, 0.86]. Simple slopes again showed that individual differences in self-control negatively predicted participants’ k -parameter in the neutral mindset condition, $B = -0.96$, $SE = 0.29$, $t(316) = -3.42$, $p < .001$, [-1.55, -0.42], but not in the conflict mindset condition, $B = -0.01$, $SE = 0.25$, $t(316) = -0.04$, $p = .965$, [-0.51, 0.48] (see Figure 1).

Again, we conducted additional contrasts comparing conditions at high ($M + 1SD = 3.68$) and low ($M - 1SD = 2.43$) levels of self-control. Mirroring the above effects, both conditions differed at high levels of self-control, $B = 0.35$, $SE = 0.17$, $t(474) = 2.04$, $p = .042$, 95% CI of B [0.01, 0.68] but not at low levels, $B = -0.26$, $SE = 0.17$, $t(474) = -1.57$, $p = .117$, [-0.59, 0.06].

Additional Analyses

We first explored whether switching to a different control condition in Study 3 influenced the results. Additional regression analyses including interaction terms between the dummy variables (Study 1/2 vs. Study 3) and the other predictors disconfirmed that. For both impulsivity and trait self-control analyses, none of the main effects nor interactions with the dummy variable reached significance (p 's between .094 and .879).

Study 3 included additional measures that could help explain the obtained effects (i.e., conflict intensity) or rule out alternative explanations (i.e., effortfulness, general positive and negative affect). First, we were interested in whether participants in the conflict mindset condition experienced different levels of conflict intensity during

³ An additional analysis including the interaction terms between the dummy variables and condition (see Yzerbyt et al., 2004) produced the same results and those additional interactions were not significant.

Table 2

Results From Regression Analyses, Separated for Each Studies 1–3

Study	Predictor	ID: Impulsivity				ID: Self-control			
		<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
1	Condition	0.38	0.17	2.28	.024				
	ID	0.76	0.56	1.36	.177				
	Condition*ID	-0.38	0.56	-0.68	.495				
	<i>Conflict MS</i>	0.38	0.83	0.46	.647				
	<i>Neutral MS</i>	1.15	0.76	1.50	.135				
2	Condition	0.04	0.18	0.21	.837	0.06	0.18	0.33	.741
	ID	0.57	0.45	1.27	.207	-0.55	0.28	-1.94	.054
	Condition*ID	-0.81	0.45	-1.83	.070	0.39	0.28	1.36	.175
	<i>Conflict MS</i>	-0.25	0.65	-0.38	.704	-0.16	0.39	-0.42	.672
	<i>Neutral MS</i>	1.38	0.61	2.28	.024	-0.94	0.41	-2.25	.026
3	Condition	0.03	0.16	0.20	.842	0.03	0.16	0.17	.865
	ID	1.23	0.58	2.11	.037	-0.46	0.26	-1.76	.080
	Condition*ID	-0.89	0.58	-1.53	.129	0.59	0.26	2.24	.027
	<i>Conflict MS</i>	0.34	0.89	0.38	.703	0.13	0.33	0.38	.706
	<i>Neutral MS</i>	2.12	0.76	2.80	.006	-1.05	0.40	-2.58	.011

Note. ID stands for Individual Difference measure, which either corresponds to impulsivity (left side) or self-control (right side). Simple slope analyses per mindset (MS) condition are printed in italics. Significant ($p < .05$) regression weights are printed in bold.

the DDT, which was not the case ($M_{\text{conflict}} = 4.22$, $SD = 2.01$; $M_{\text{neutral}} = 4.27$, $SD = 1.83$), $t(160) = -0.17$, $p = .863$, $d = 0.03$.

Next, we tested for possible differences in the perceived effortfulness of the manipulation. We found that participants in the conflict mindset condition ($M = 39.09$, $SD = 21.87$) experienced the manipulation procedure as more effortful than participants in the neutral mindset condition, $M = 29.82$, $SD = 20.26$, $t(160) = 2.79$, $p = .006$, $d = 0.44$. This difference, however, was no alternative interpretation for the focal interaction between condition and trait measures on k , as effort scores and impulsivity/self-control never interacted (all t s $< |11.10|$).

In a final analysis, we tested whether general affect plays a role in our findings. Results showed that the conditions did not differ in

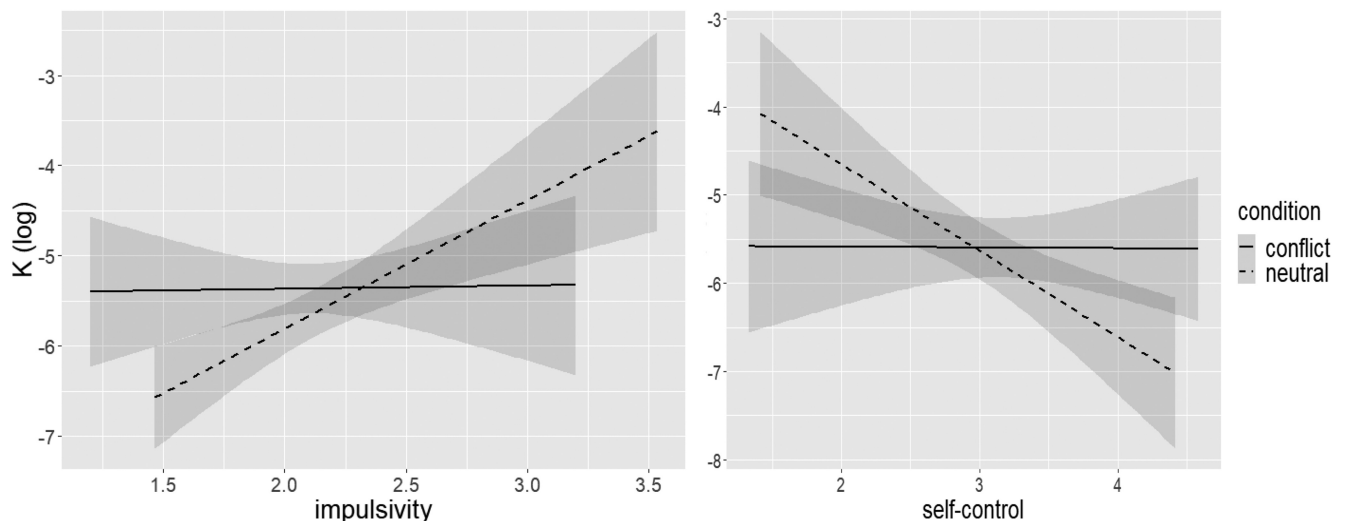
their level of positive or negative affect reported after the DDT; positive affect: $M_{\text{conflict}} = 46.51$, $SD = 32.25$; $M_{\text{neutral}} = 48.79$, $SD = 31.36$; $t(160) = 0.46$, $p = .645$, $d = 0.07$; negative affect: $M_{\text{conflict}} = 13.35$, $SD = 20.80$; $M_{\text{neutral}} = 9.37$, $SD = 17.02$; $t(160) = -1.33$, $p = .187$, $d = 0.21$.

Discussion

In the present study, we investigated the influence of a conflict mindset on a key aspect of self-control decision-making, namely people's preference for a smaller immediate versus a larger delayed reward (i.e., delay discounting). The combined evidence of three studies supported the *flexibility hypothesis*: in the conflict mindset

Figure 1

The Relationship Between Trait Measures of Impulsivity (Left) and Self-Control (Right) on the k -Parameter per Mindset Condition (Across Studies 1–3). Shaded Areas Represent 95% Confidence Interval



condition participants' choice behavior in the DDT was less influenced by their dispositional response tendencies, measured as trait impulsivity and trait self-control. Specifically, we found that in the conflict mindset condition, participants' trait measures were unrelated to their choice behavior in the DDT. In the neutral mindset condition, however, participants' trait measures did predict their choice behavior in the DDT. Here, higher impulsivity scores and lower self-control scores were related to a stronger tendency to choose immediate over delayed rewards. We could also show that participants with low levels of impulsivity or high levels of self-control showed a relative shift in their preference toward immediate rewards (i.e., more delay discounting) in the conflict (vs. neutral) mindset condition. This difference was not found at high levels of impulsivity or low levels of self-control—which makes sense considering that our sample consisted of students with on average relatively high levels of trait self-control. Importantly, the overall pattern of findings was the same for both individual difference measures, which provides extra support for the flexibility hypothesis.

Additional analyses on the data of Study 3 demonstrated that the obtained effects were not due to differences between conditions in experienced conflict intensity or negative affect during the DDT. This is important as previous research has found that conflict intensity as well as negative affect can influence self-control efforts (Kroese et al., 2011; Kuhl, 2000). That neither conflict intensity nor affect during the DDT differed between conditions also supports the general notion that the conflict mindset effect is more based on a change in cognitive procedure (e.g., considering alternatives) than on a change in how the upcoming situation is experienced. Moreover, our finding that the level of effortfulness of the conflict mindset manipulation did not account for our main findings rules out the possibility of effort-induced depletion effects (for a recent critical discussion on the effort-induced depletion effects see Inzlicht & Friese, 2019), according to which participants could have become less motivated or able to invest more self-control effort during the subsequent DDT. For example, there is work showing that taxing working memory while performing a DDT influences participants' discounting rate (Hinson et al., 2003). Instead, our findings are in line with recent theorizing on conflict mindsets, according to which a conflict mindset reduces people's reliance on default response tendencies (Kleiman & Enisman, 2018; Sassenberg et al., 2022). We thereby extend the current mindset literature by demonstrating that the established effects also replicate in the self-control domain.

The presented line of research also contributes to the literature investigating the link between impulsivity and delay discounting. The concept of impulsivity is strongly linked to people's preference for immediate over delayed rewards, which is why the DDT is often seen as a behavioral measure of impulsivity. Accordingly, several studies have demonstrated correlations between self-report measures of impulsivity and performance on the delay discounting task (e.g., de Wit et al., 2007; Kirby et al., 1999). However, it is important to note that there are also several studies which report no relationship between both measures (e.g., Perales et al., 2009), which may be due to the different facets and operationalizations of impulsivity (Baumann & Odum, 2012). In our study, we could show that under neutral conditions and in a standard, fully powered student sample, self-reported impulsivity, and performance in the DDT were correlated in the expected direction. This relationship was, however, completely absent in the conflict mindset condition, which demonstrates that this relationship is subject to situational

influences. As such, our studies also add to the body of evidence arguing that people's discounting rate is not stable across time but can change as a result of situational factors. For example, taxing executive functions (e.g., through working memory load, time pressure), increasing the saliency of future rewards (e.g., future focus) or manipulating participants' general time perception has been shown to momentarily change participants' delay discounting rates (for a review see Koffarnus et al., 2013; Scholten et al., 2019).

Finally, the finding that a conflict mindset is one situational factor that can modulate the behavioral manifestation of individual trait variables also contributes to a much broader literature within psychology, namely to the long-standing investigation into person \times situation interactions and personality consistency (see Bem & Allen, 1974; Mischel et al., 2002). At first glance, the absence of a main effect (overall enhanced or reduced preference for immediate over delayed reward in the DDT) might seem inconsistent with the literature, which does indeed often report main effects (see footnote 1 and pre-registrations of Studies 1 and 2; for an overview see Kleiman & Enisman, 2018). However, we want to emphasize that our findings do not contradict the existing literature. Instead, they may even help understand under what circumstances one should expect a main effect and also under what circumstances it might be more appropriate to take individual differences into account and predict an interaction. Specifically, in contexts in which default behavioral tendencies are univocally present (e.g., confirmation bias) or experimentally enforced (e.g., through increasing time pressure; Alquist et al., 2018) a main effect can be expected, because people in a conflict mindset will depart from a similar default. However, in contexts in which there is individual variability in people's response tendencies, one should consider measuring those in order to find a meaningful conflict mindset effect. For example, Winter et al. (2021, 2022) report a very similar pattern of findings to ours: the association between participants' pre- and post-measures of trust regarding a social group was weaker in a condition in which a conflict was evoked between measurements, whereas both measurements did strongly converge in the control condition. Drawing attention to this interactive pattern is important, because it can also help understand why sometimes researchers fail to obtain their predicted mindset effects—because they may have not considered the possible individual variability on the default response.

Implications and Limitations

Our finding that a conflict mindset can reduce the influence of default tendencies on behavior has potential implications for research on behavior change. A lot of our daily behaviors are determined by strong behavioral tendencies. Such habitual behaviors are not only difficult to change, they are also often important to change, especially when they contribute to the maintenance of an unhealthy and unsustainable lifestyle (e.g., snacking in front of the TV, taking the car to work). Changing those strong behavioral tendencies is one of the main challenges in the study of behavior change and it seems that a conflict mindset might provide a window of opportunity. More specifically, in order for change to happen people need to first consider an alternative, and a conflict mindset is one way of achieving this. That offers a new and interesting perspective on behavior regulation: changing default behaviors might not only be achieved through a stronger focus on behavioral control (e.g., inhibition of default response) it might also be achieved through behavioral flexibility

(e.g., the consideration of alternatives). This perspective is also an important addition to the current discussion in the self-control literature, which argues that self-control is not only about inhibition, but can also be achieved through other processes or strategies (e.g., situation selection; Duckworth et al., 2016). More research is needed to study how exactly conflict mindsets might be used as an intervention to motivate the (momentary) deviation from default response tendencies in the health and sustainability domain.

One of the key open questions in the mindset literature which also applies to our studies is the question about how long those mindset effects would prevail. In our studies, participants moved on directly after the mindset manipulation to the DDT, which took about 10 min to complete. It is, therefore, impossible to test whether mindset effects would have also occurred when the measurement would have been delayed. To our knowledge, there are no existing studies which systematically tested after how much time mindset effects would still occur. One prerequisite for the mindset to take effect is, however, that it is active throughout the subsequent task. We, therefore, followed the procedure of earlier studies and explicitly asked participants to keep the conflict situation they just remembered in mind throughout the experiment (Stern & Kleiman, 2015). Independent of how long the effects could eventually be stretched, it is probably safe to say that the likelihood of change is highest directly after the conflict mindset is triggered—especially given the overall small effect size of our main finding. In situations in which a conflict mindset might be used for an intervention, it is therefore important to make sure that the to-be-changed behavior is temporally as close as possible to the manipulation.

Another important limitation of our studies is that we used a homogenous young and educated student sample, which could be more used and open to processing conflicting information. That is an important point to consider, given that the activation and consideration of alternatives probably require a certain level of working memory capacity as well as motivation. It is, therefore, possible that other populations react differently to a conflict mindset manipulation. To our knowledge, there has not been any systematic investigation into whether different samples react differently to a conflict mindset manipulation. There are, however, some studies that found similar effects in a sample with a broader age range (Knab et al., 2021).

Finally, we chose the DDT as the central measure of self-control decision-making, because it operationalizes one key aspect of it, namely people's trade-off between a smaller immediate and a larger delayed reward and because it has been shown in the past to relate to individual differences in impulsivity. However, the task is designed in such a way that it cannot measure a phenomenon called negative discounting (Abdellaoui et al., 2018). Negative discounting refers to "preference for satisfaction later than sooner" (p. 3; Abdellaoui et al., 2018) and has been observed for objects that increase in value over time (e.g., special bottle of champagne) or for situations that people enjoy looking forward to. One could argue that in order to test mindset effects on self-control decisions one should use a measure that covers the full spectrum of preferences, including the possibility to show negative discounting. Even though this is an interesting research question in and of itself, it does not limit the implications of our findings for two reasons. First, negative reinforcement discounting is not typically found for money (few people would prefer less money in the future), so in the set-up of our study, we probably would not have found it. Second, the change in

preferences which we see in the conflict mindset condition looks more like a mitigation rather than a full reversal of preferences. We, therefore, are confident that the choice of task did not unintentionally prevent us from finding negative reinforcement effects.

Conclusion

In the present study, we investigated whether and how activating a conflict (vs. neutral) mindset would influence people's subsequent self-control choices, which were operationalized as a preference for smaller immediate over larger delayed rewards in a delay discounting task. The evidence from three combined studies supported the flexibility hypothesis: participants' dispositional tendencies predicted their preference for immediate over delayed rewards in the neutral mindset condition (higher trait impulsivity and lower trait self-control scores were related to more delay discounting) but not in the conflict mindset condition. In line with previous work on conflict mindsets, that finding suggests that in the conflict mindset condition, participants' choices were less influenced by their default response tendencies. Our finding that a conflict mindset promotes flexibility could be interesting for research on behavior change, especially in domains such as health and sustainability, in which strong habitual behaviors maintain maladaptive life style patterns.

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