



It's the thought that counts: Trait self-control is positively associated with well-being and coping via thought control ability

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Abstract

In the present study, we reason that the ability to keep unwanted thoughts and intrusions at bay – thought control ability – might explain part of the relationship between trait self-control and positive psychological outcomes. We predict that the ability to keep unwanted thoughts at bay causes people high in trait self-control to report higher subjective well-being (Study 1), and makes them to be more likely to cope with stressful life events in an adaptive rather than maladaptive manner (Study 2). Two cross-sectional studies among healthy individuals were conducted (Study 1 $n = 284$; 70% female; $M_{age} = 22.15$ years; Study 2 $n = 210$, 65.7% female, $M_{age} = 28.07$) in which trait self-control, thought control ability, subjective well-being (study 1), and coping styles (study 2) were measured. Additionally, we investigated the mediating role of thought control ability and the conditional effect of gender on this mediation. The results of Study 1 indicate that trait self-control is positively related to subjective well-being. Moreover, thought control ability fully mediated the relationship between trait self-control and subjective well-being, and this effect was particularly strong for women. In Study 2, trait self-control was positively associated with adaptive forms of coping, but negatively with maladaptive coping. Moreover, thought control ability partially mediated the relationship between trait self-control and both types of coping, with stronger results for women than for men. These results suggest that trait self-control affects positive life outcomes in part through an ability to keep unwanted thoughts at bay, thereby facilitating a focus on goal pursuit.

Keywords Trait self-control · Subjective well-being · Coping strategies · Thought control ability · Mediation

The benefits of the ability to exert self-control have been amply described in the psychological literature: High trait self-control is associated with academic success (Duckworth and Carlson 2013), better interpersonal relationships (De Ridder et al. 2012), and more healthy behaviors (Moffitt et al. 2011). Self-control is defined as “[...] the ability to override or change one’s inner responses, as well as to interrupt undesired behavioral tendencies (such as impulses) and refrain from acting on them” (Hofmann et al. 2014, p.1). In most cases, this ability is conceptualized as an effortful and conscious inhibitory process. However, recently Gillebaart and De Ridder (2015) proposed the notion of *effortless* self-control, that is, an almost automatic ability of strategically avoiding temptations and developing adaptive routines, which in turn

facilitates the initiation of goal pursuit (see also De Ridder and Gillebaart 2017). Indeed, people with high levels of trait self-control report fewer temptations in their immediate environments (Hofmann et al. 2012), less subjective evaluative response conflicts over food items (Gillebaart et al. 2016), more beneficial habits (Galla and Duckworth 2015), and avoid – rather than resist – distractions (Ent et al. 2015).

In addition to sustaining a focus on one’s goal pursuits and to avoid temptations, distractions, or impulses, the benefits of high levels of trait self-control have also been established for other favorable life outcomes. For example, individuals high in trait self-control have higher self-acceptance, see themselves as valuable and worthy, and are able to maintain this favorable view of themselves across time and circumstances (Tangney et al. 2004). Further, trait self-control is associated with personality traits like conscientiousness, agreeableness, and emotional stability (Layton and Muraven 2014), which in turn have been associated with objective and subjective life successes, as well as well-being (e.g. Duckworth et al. 2012). High trait self-control also facilitates a healthier life: Possessing higher levels of trait self-control contributes to achieving positive behavioral outcomes as well as avoiding

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negative behavioral outcomes (De Ridder et al. 2012), and in line with Gillebaart and De Ridder's (2015) reasoning, this effect was more pronounced for automatic or habitual behaviors rather than conscious behaviors.

Several explanatory variables for the relationship between self-control and positive life outcomes have been put forward. For example, the ability to (automatically) avoid conflicts between immediate gratification of temptations and goal pursuit seems to be a mediator (Gillebaart et al. 2016). Additionally, individuals with high trait self-control seem to be focused on positive rather than negative outcomes (or stimuli), which in turn leads to higher levels of happiness. For example, Cheung et al. (2014) found that regulatory focus mediated the relationship between trait self-control and happiness, such that individuals with high self-control were more promotion oriented (i.e., not missing opportunities) and less prevention oriented (i.e., avoiding mistakes) while pursuing their goals. This focus on positive rather than negative stimuli was also shown in a study which utilized eye gaze patterns as a measure of attentional bias (Kelley et al. 2014), and which showed that individuals with high trait self-control attended more to positive rather than negative images, even when reminded of their personal mortality.

Here, we posit that one additional variable which might explain why individuals with high trait self-control are generally more satisfied with their lives, is their (perceived) ability to control unwanted or distracting thoughts; also termed thought control ability (see Luciano et al. 2005). *Thought control ability* is the perception that one is able to effortlessly prevent unwanted thoughts that may subsequently interfere with other cognitive processes from entering consciousness. Such unwanted thoughts, or intrusions, are experienced by over 90% of individuals in the normal, nonclinical population (Radomsky et al. 2014). They interrupt one's normal flow of thoughts, interfere with task performance, and are associated with negative affect (Clark and Rhyno 2005). Several cognitive strategies can be employed to gain thought control, such as suppression, the effortful attempt to inhibit certain thoughts, although ironically this often results in their hyper-accessibility (i.e., rebound effects; Wegner et al. 1987). Importantly, one's thoughts do not always have to be negative to interfere with well-being, as positive unwanted thoughts may also not always be helpful to one's cognitive processes. For example, Killingsworth and Gilbert (2010) report on an experience-sampling study among 2250 adults which showed that people were most happy when they were focusing on their activities rather than letting their mind wander, even if they were mind-wandering about positive things (see also Kane et al. 2007).

Moreover, an *inability* to control the occurrence and content of one's thoughts is a component of many psychopathological disorders (American Psychiatric Association 2013), and lower levels of perceived thought control ability are

predictive of a range of psychopathological symptoms (Höping and De Jong-Meyer 2003; Peterson et al. 2009). It has been suggested that deficits in thought control ability might also be an expression of low self-control (Baumeister et al. 2007), since akin to trait self-control, the ability to keep intrusions at bay allows one to focus on goal attainment and productive activities. Conversely, the susceptibility to be distracted by task-irrelevant thoughts has been associated with impulsivity and a lack of self-control (Gay et al. 2011), as well as with a lack of perseverance and procrastination (Rebetz et al. 2018).

To sum up, there is by now considerable research which connects trait self-control to positive psychological functioning such as subjective well-being, and it has been suggested that individuals with high trait self-control are characterized by the '[...] ability to override or change one's *inner responses*' (see Hofmann et al. 2014, p.1) – including thoughts. In line with this, we argue that the ability to control one's thoughts, and thereby preventing unwanted intrusions from interfering with one's goal pursuits, is likely to be part of this ability. Supporting this assumption is the finding that the ability to control intrusive thoughts is positively associated with well-being, and negatively with an array of psychopathological symptoms (e.g. Höping and De Jong-Meyer 2003; Luciano et al. 2005; Peterson et al. 2009). In the current research, we therefore hypothesize that thought control ability functions as a mediator in the relationship between trait self-control and positive life outcomes, explaining (part of) the relationship between these variables. To measure perceived thought control ability, the Thought Control Ability Questionnaire (TCAQ; Luciano et al. 2005) will be used in the current research. A recent systematic review (Feliu-Soler et al. 2019) revealed that this measure has been satisfactorily used in a variety of populations – including individuals from the general populations and patients with PTSD or clinical depression – and that the instrument has adequate dimensionality, reliability, and construct validity.

Study 1

In our first study, we will investigate the mediating role of thought control ability in the relationship between trait self-control and subjective well-being, the latter operationalized as life satisfaction and momentary affect. Life satisfaction is considered to be the cognitive component of subjective well-being, and constitutes an appraisal of one's overall quality of life (Diener et al. 1999), whereas momentary affect is the emotional component of subjective well-being. Given the centrality of cognition in both life satisfaction and thought control ability, we expect that the mediation effect should be stronger for life satisfaction than for momentary affect. Additionally, we will explicitly investigate whether there is a gender

difference in the hypothesized associations, since the literature indicates that women are more likely to ruminate (e.g. Johnson and Whisman 2013), and that men are better able to control their thoughts (Peterson et al. 2009). One might therefore expect that the mediation of thought control ability between trait self-control and subjective well-being is conditional on participants' gender.

Method

Participants

Participants were 284 adults ($n = 199$ female; $n = 85$ male; $M_{\text{age}} = 22.15$ years, $SD = 2.78$; age range 18–30), recruited via social media and the undergraduate student participant pool. Participation was voluntary; reward consisted of partial course credit (for students) and raffled gift tokens. Nationalities of the participants were Dutch (29.6%), German (27.5%), Czech (20.4%), and other (22.5%). Approval for materials and procedures used in the study was obtained from Ethics Research Committee of Psychology and Neuroscience at Maastricht University (ECP04-09-2012-01), and informed consent was obtained from all participants.

Materials and Procedure

Upon entering the online survey, participants were informed about the general aims of the study, provided informed consent, and provided demographic information. Then, they first completed the 13-item Trait Self-Control Scale (Tangney et al. 2004). On a scale ranging from 1 (*not at all like me*) to 5 (*very much like me*) participants indicated the applicability of statements that measure individual differences of self-control, such as “I am good at resisting temptation”; $\alpha = .80$.

Next, they continued with the 25-item Thought Control Ability Questionnaire (Luciano et al. 2005), that measures individual differences in the ability to control unwanted, intrusive thoughts. Participants indicated their agreement with the statements on a response scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). An example item is “I am usually successful when I decide not to think about something”; $\alpha = .89$. We used sum scores (range 25–125) in all analyses.

Participants' affective well-being was assessed using the Positive and Negative Affect Schedule (PANAS; Watson et al. 1988). Individuals were asked to assess ten positive emotions (interested, excited, determined, attentive, enthusiastic, proud, alert, inspired, active, strong) and ten negative emotions (irritable, guilty, jittery, hostile, distressed, ashamed, upset, nervous, scared, afraid) they were experiencing in the current moment. Answers were provided on a scale ranging from 1 (*not at all*) to 5 (*very much*); $\alpha = .88$ for positive affect,

and $\alpha = .89$ for negative affect. To facilitate analyses and in line with Fredrickson and Losada (2005), we used the *ratio* of positive to negative emotions as a measure of momentary affect.

In the final measure of the study, participants completed the five-item Satisfaction With Life Scale (Diener et al. 1985). Participants indicated their agreement with the statements on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). An example is “In most ways my life is close to ideal”; $\alpha = .87$.

After completing all measures, participants were thanked for their participation and fully debriefed about the study's aim and hypotheses. The data and survey instrument for this study can be found on: <https://osf.io/pfm8h/>.¹

Results

Correlations and T-Tests

Correlation analyses (see Table 1) indicated that as expected, both trait self-control and thought control ability were positively associated with life satisfaction and momentary affect. Specifically, we found medium to strong correlations for thought control ability ($r = .40$ and $r = .40$), and small to medium correlations for trait self-control ($r = .16$ and $r = .23$). Since gender was also associated with thought control ability ($r = -.27$), independent sample t-tests were performed for all variables. These showed that men and women did not differ in their levels of trait self-control, life satisfaction, or momentary affect ($t_s(282) < -1.19$). However, men scored significantly higher ($M = 80.36$, $SD = 12.24$) than women ($M = 72.70$, $SD = 12.84$) on thought control ability: $t(282) = 4.67$, $p < .001$. Therefore, we decided to also investigate the role of gender in our subsequent analyses.

Simple Mediation

Next, we conducted bootstrapped conditional mediation analyses (using the PROCESS macro, Model 4; Hayes 2013), with asymmetric 95% confidence intervals that were based on 5000 bootstraps for indirect effects. All variables were standardized. Thought control ability was included as the mediator variable, and life satisfaction and momentary affect were included as outcome variables.

These analyses indicated that the relationship between trait self-control and *life satisfaction* was fully mediated by thought control ability (total indirect effect: $\beta = .10$, $SE = .03$, 95% CI [0.05, 0.16], $R^2 = .02$, $F(1,282) = 6.90$, $p < .01$), such that the total effect ($\beta = .15$, $t(282) = 2.63$, $p < .01$) became non-

¹ This project will be made public once the manuscript has been accepted for publication.

Table 1 Descriptive statistics and intercorrelations for all measures included in Study 1 (n = 284)

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Trait Self-control	2.94	.56	–			
2. Thought Control Ability	74.99	13.12	.25**	–		
3. Life Satisfaction	4.98	1.17	.16*	.40**	–	
4. Momentary affect	1.86	.79	.23**	.40**	.29**	–
5. Gender	–	–	.07	–.27**	.06	.04

Gender coded 1(male), 2(female); * $p < .01$; ** $p < .001$

significant when the indirect effect was added (direct effect: $\beta = .06$, $t(282) = 1.05$, *ns*). Further, thought control ability partially mediated the relationship between trait self-control and *momentary affect* (total indirect effect: $\beta = .09$, $SE = .03$, 95% CI [0.05, 0.16], $R^2 = .05$, $F(1,282) = 16.19$, $p < .001$), such that the total effect ($\beta = .23$, $t(282) = 4.02$, $p < .001$) was reduced when the indirect effect was added (direct effect: $\beta = .14$, $t(282) = 2.56$, $p < .05$).

Conditional Process Modeling

Given the significant differences in thought control ability between men and women, we also investigated whether participant sex moderated the relationship between trait self-control and thought control ability (path *a*), or the relationship between thought control ability and life satisfaction/momentary affect (path *b*) using PROCESS model 58 (Hayes 2013).

For *life satisfaction*, this analysis revealed that there was a marginal effect of gender as a moderator on path *a* (trait self-control \rightarrow thought control ability), $\beta = .21$, $SE = .12$, $p = .06$, but not for path *b* (thought control ability \rightarrow life satisfaction), $\beta = -.02$, $SE = .13$, *ns*. The analysis of the moderation effect indicated that the relationship between trait self-control and thought control ability was not significant for men ($\beta = .05$, $SE = .05$, 95% CI [–.04, .17]), but that it was significant for women ($\beta = .14$, $SE = .04$, 95% CI [.08, .22]). Further, in line with the marginal significance of the interaction, the Index of Moderated Mediation was not significant ($\beta = .09$, $SE = .06$, 95% CI [–.05, .21]).

For *momentary affect*, we found no indication for conditional mediation; gender did not moderate path *a* (trait self-control \rightarrow thought control ability), $\beta = .21$, $SE = .12$, $p = .10$, or path *b* (thought control ability \rightarrow momentary affect), $\beta = -.11$, $SE = .12$, *ns*. However, the analysis of the moderation effect of path *a* indicated that the relationship between trait self-control and thought control ability was not significant for men ($\beta = .06$, $SE = .06$, 95% CI [–.05, .18]); but there was significant mediation for women ($\beta = .12$, $SE = .03$, 95% CI [.07, .20]). Again, the Index of Moderated Mediation was not

significant ($\beta = .06$, $SE = .07$, 95% CI [–.07, .20]). Thus, although these effects failed to reach full statistical significance, there are indications that the mediation effect of thought control ability in the association between trait self-control and well-being differs for men and women.

Discussion

The results from Study 1 indicate that one's ability to keep unwanted thoughts at bay might in part explain why individuals – specifically, women – with high trait self-control report higher subjective well-being. It has been firmly established in the literature that intrusions, mind wandering, and rumination negatively affect well-being, and in this study we provide some preliminary evidence that being able to control such involuntary cognitions is positively associated with subjective well-being. These results are consistent with previous research that established the positive relationship between trait self-control and psychological well-being (Hofmann et al. 2014; Cheung et al. 2014). Moreover, these results are in line with research by Gay et al. (2011) who showed that negative urgency and a lack of perseverance – two aspects of impulsivity traditionally equated with lower self-control – were negatively associated with the ability to control one's thoughts. Our study suggests that the ability to effortlessly control one's thoughts provides part of the explanation why (female) individuals with higher trait self-control also report higher subjective well-being.

In addition to subjective well-being, trait self-control is associated with other positive psychological outcomes, such as an increased ability to effectively cope with stressful situations (Galla and Wood 2015). In Study 2 our main aim is therefore to extend the findings of Study 1, and to investigate the mediating role of thought control ability in the relationship between trait self-control and another positive life outcome, specifically, adaptive coping strategies.

Study 2

Coping is defined as a variety of “[...] conscious volitional efforts to regulate emotion, cognition, behavior, physiology, and the environment in response to stressful events or circumstances” (Compas et al. 2001, p. 89). As implied by this definition, coping may be seen as a reflective process which is dependent on self-control resources, such that increased self-control is associated with more adaptive forms of coping, such as problem-focused coping and reappraisal (e.g. Galla and Wood 2015). Indeed, several studies show that individuals with high levels of trait self-control engage in more adaptive (or positive) forms of coping, and that those with lower levels of self-control are more likely to engage in maladaptive forms

of coping (e.g. Boals et al. 2011; Englert et al. 2011). Adaptive coping generally brings about more enduring changes or solutions in dealing with (the cause of) the problem or the stressor, whereas maladaptive coping strategies focus on immediate relief from the negative feelings that arise as a consequence of the stressor, but do not necessarily address the cause of the stress (Lazarus and Folkman 1984).

Although the research on thought control ability and coping strategies is scarce, Peterson et al. (2009) have suggested that individuals' belief in their ability to control their thoughts in itself represents a form of psychological coping with stressors: In their study, negative psychological symptoms were predicted by individuals' perceived thought control ability, over and beyond the variance explained by experienced stress. There are also more indirect indications that less effective thought control ability is associated with less adaptive forms of coping such as worrying or punishment, in the context of psychological trauma (e.g. Valdez and Lilly 2012), and that being unable to stop intrusive thinking (rumination) is associated with subsequent poor problem-solving abilities (Lyubomirsky et al. 1999). We therefore expect that the positive associations between trait self-control and coping strategies may be (in part) explained by individuals' perceived ability to keep unwanted thoughts from distracting them, allowing for more enduring responses to daily stressors, and a decreased likelihood of choosing maladaptive coping strategies such as substance abuse. In Study 2, we again take participants' gender into account, especially given the findings of Study 1.

Method

Participants

Participants were 210 adults ($n = 138$ female; $n = 72$ male; $M_{\text{age}} = 28.07$ years, $SD = 9.99$; age range 18–68). They were recruited via social media or the undergraduate student participant pool ($n = 141$), as well as via Amazon's MTurk ($n = 69$). Participation was voluntary; reward consisted of partial course credit (for students) or payment (for Mturkers). Nationalities of the participants were German (33.8%), American (32.9%), Dutch (13.8%), and other (19.5%). Approval for materials and procedures used in the study was obtained from Ethics Research Committee of Psychology and Neuroscience at Maastricht University (ECP04-09-2012-02), and informed consent was obtained from all participants.

Materials and Procedure

Similar to the method used in Study 1, upon entering the online survey participants were informed about the general aims of the study, provided informed consent,

and provided demographic information. Then, they completed the 13-item Trait Self-Control Scale (Cronbach's $\alpha = .87$; Tangney et al. 2004) and the 25-item Thought Control Ability Questionnaire (Cronbach's $\alpha = .94$; Luciano et al. 2005).

Next, participants completed the brief COPE (Carver 1997). This scale has 14 subscales, each consisting of 2 items. Participants were asked to indicate how they usually dealt with (stressful) events in their lives. They could answer on a 4-point scale: 1 = *I haven't been doing this at all*, 2 = *I've been doing this a little bit*, 3 = *I've been doing this a medium amount*, 4 = *I've been doing this a lot*. Sample items for the 14 Brief COPE scales are as follows: (1) Active coping: "I've been concentrating my efforts on doing something about the situation I'm in"; (2) Planning: "I've been thinking hard about what steps to take"; (3) Use of emotional support: "I've been getting emotional support from others"; (4) Use of instrumental support: "I've been getting help and advice from other people"; (5) Positive reframing: "I've been trying to see it in a different light, to make it seem more positive"; (6) Acceptance: "I've been accepting the reality of the fact that it has happened"; (7) Religion: "I've been trying to find comfort in my religion or spiritual beliefs"; (8) Humor: "I've been making jokes about it"; (9) Venting: "I've been expressing my negative feelings"; (10) Denial: "I've been saying to myself 'this isn't real'"; (11) Substance use: "I've been using alcohol or other drugs to help me get through it"; (12) Behavioral disengagement: "I've been giving up trying to deal with it"; (13) Self-distraction: "I've been turning to work or other activities to take my mind off things"; and (14) Self-blame: "I've been blaming myself for things that happened.". In general, scales 1 through 8 can be regarded as adaptive coping, whereas scales 9 through 14 consist of more maladaptive coping strategies. However, in the current study, factor analysis indicated a 4-factor solution fit the data better: We called factor 1 *maladaptive coping* (behavioral disengagement, self-blame, substance use, and denial; Cronbach's $\alpha = .65$), factor 2 *social coping* (instrumental support, emotional support, venting; Cronbach's $\alpha = .72$), factor 3 *problem-solving* (planning, active coping, positive reframing, acceptance; Cronbach's $\alpha = .74$), and factor 4 *positive distraction* (humor, self-distraction; $r = .31$). Religious coping was left out of consideration given the low factor loadings (all $< .36$).

After completing all measures, participants were thanked for their participation and fully debriefed about the study's aim and hypotheses. MTurk workers subsequently received payment, and students received partial course credit. The data and survey instrument for this study can be found on: <https://osf.io/pfm8h/>.

Results

Correlations and T-Tests

Correlation analyses (see Table 2) indicated that trait self-control and thought control ability were positively associated with problem solving, and negatively with maladaptive coping. Specifically, we found medium to strong negative correlations for trait self-control ($r = .38$ and $r = -.41$) as well as thought control ability ($r = .42$ and $r = -.56$). However, there were no significant associations with positive distraction or social coping for either self-control or thought control ability (r 's < .13). Given the absence of associations between our independent variables and these latter coping variables, we decided to leave them out of further consideration. Next, t -tests were used to investigate gender differences for both independent and both dependent variables. These analyses showed that men and women did not differ in trait self-control and maladaptive coping (t 's < $-.96$). However, men scored significantly higher than women on thought control ability [men $M = 82.96$, $SD = 16.43$, women $M = 73.42$, $SD = 18.86$; $t(208) = 3.63$, $p < .001$] and problem solving [men $M = 2.99$, $SD = .52$, women $M = 2.81$, $SD = .57$; $t(208) = 2.28$, $p < .05$].

Simple Mediation

Next, we conducted bootstrapped conditional mediation analyses (using the PROCESS macro, model 4; Hayes 2013), with asymmetric 95% confidence intervals that were based on 5000 bootstraps for indirect effects. All variables were standardized. Thought control ability was included as the mediator variable, and maladaptive coping and problem solving were included as outcome variables.

These analyses indicated that the relationship between trait self-control and maladaptive coping was partially mediated by thought control ability (total indirect effect: $\beta = -.22$, $SE = .04$, 95% CI $[-0.31, -0.15]$, $R^2 = .17$, $F(1,207) = 40.94$, $p < .001$), such that the total effect ($\beta = -.41$, $t(207) = -6.40$, $p < .001$) was reduced when the indirect effect was added

(direct effect: $\beta = -.18$, $t(207) = -2.84$, $p < .01$). Further, thought control ability also partially mediated the relationship between trait self-control and problem solving (total indirect effect: $\beta = .14$, $SE = .04$, 95% CI $[0.07, 0.23]$, $R^2 = .15$, $F(1,208) = 35.37$, $p < .001$), such that the total effect ($\beta = .38$, $t(208) = 5.95$, $p < .001$) was reduced when the indirect effect was added (direct effect: $\beta = .24$, $t(208) = 3.41$, $p < .001$).

Conditional Process Modeling

Given the gender differences in thought control ability and problem solving, as well as the results from Study 1, we again tested for conditional mediation (using PROCESS model 58, 95% CI and 5000 bootstraps; Hayes 2013). These analyses revealed that, similar to the findings of Study 1, for maladaptive coping, this analysis revealed a marginally significant effect for the moderation of gender on path a (trait self-control → thought control ability), $\beta = .23$, $SE = .12$, $p = .06$, but not for path b (thought control ability → maladaptive coping), $\beta = .11$, $SE = .13$, ns . The analysis of the marginal moderation effect indicated that the relationship between trait self-control and thought control ability was significant for both men ($\beta = -.18$, $SE = .06$, 95% CI $[-.31, -.07]$), and women ($\beta = -.25$, $SE = .05$, 95% CI $[-.36, -.16]$) but that the effects were stronger for women. The Index of Moderated Mediation was not significant ($\beta = -.07$, $SE = .08$, 95% CI $[-.22, .08]$).

For problem solving, we again found that gender moderated path a (trait self-control → thought control ability), $\beta = .23$, $SE = .13$, $p < .05$, but not path b (thought control ability → problem solving), $\beta = .21$, $SE = .14$, ns . The analysis of the moderation effect indicated that the relationship between trait self-control and thought control ability was not significant for men ($\beta = .04$, $SE = .04$, 95% CI $[-.014, .14]$); but it was for women ($\beta = .19$, $SE = .06$, 95% CI $[.09, .31]$). The Index of Moderated Mediation was significant ($\beta = .15$, $SE = .06$, 95% CI $[.026, .28]$).

Table 2 Descriptive statistics and intercorrelations for all measures included in Study 2 (n = 210)

Variable	M	SD	1	2	3	4	5	6
1. Trait Self-control	3.22	.72	–					
2. Thought Control Ability	76.69	18.59	.47***	–				
3. Maladaptive Coping	1.66	.52	-.41***	-.56***	–			
4. Problem solving	2.87	.56	.38***	.42***	-.24***	–		
5. Social coping	2.55	.64	.11	-.05	-.06	.22**	–	
6. Positive distraction	2.56	.67	-.13	.07	.02	.29***	.05	–
7. Gender	–	–	-.03	-.24***	.07	-.16*	.21**	.004

Gender coded 1(male), 2(female); * $p < .05$; ** $p < .01$; *** $p < .001$

Discussion

In Study 2, we extended our findings of Study 1 by showing that the perceived ability to control one's thoughts partially mediates the relationship between trait self-control and coping strategies, and in particular for women. However, the results were weaker than those found in Study 1, and we found only partial mediation effects. This suggests that although controlling one's thoughts helps individuals in dealing more effectively with stressful situations – as well as less ineffectively – trait self-control remains directly predictive of coping strategies. Indeed, the lack of full mediation might be explained by a suggestion forwarded by Hofmann et al. (2012). These authors concluded that one of the main benefits of trait self-control might be the ability to avoid problematic situations or stress – i.e. *anticipatory* coping – rather than controlling one's thoughts, emotions, or behaviors once such stressors are encountered. The current results also fit in with reasoning about thought control ability being a coping strategy in and of itself (e.g. Gaudreau and Blondin 2002; although these authors defined thought control as 'emphasizing positive aspects of the self and of past, actual, and future stressful sport situations', p. 7).

Interestingly, in the current study, the indirect effect for maladaptive coping strategies was stronger ($\beta = -.22$) than that for problem solving ($\beta = .14$), suggesting that being able to effectively control one's thoughts could benefit individuals especially in the context of less constructive coping strategies such as self-blame or substance use. Similar to the suggestion made by Boals et al. (2011), lower self-control combined with a perceived inability to avoid intrusive thoughts might thus be indicators of individuals' tendency to engage in less healthy coping strategies. These associations become especially relevant if one is trying to pursue (cognitive) goals in the context of e.g. substance abuse or dieting, since it has also been established that rumination is predictive of choosing maladaptive distraction strategies, such as substance abuse or binge eating, especially among women (e.g. Nolen-Hoeksema et al. 2007).

General Discussion

The aim of the current research was to investigate whether individuals' perceived ability to control their thoughts could be one of the possible mediating variables in the relationship between trait self-control and positive psychological outcomes – specifically, subjective well-being and coping. The results from both studies indicate that indeed, the ability to keep intrusive thoughts from distracting goal pursuit or a focus on meaningful activities partially explains why individuals with high self-control report higher well-being and more adaptive coping strategies. Moreover, we found a consistent gender difference, such that

these mediating relationships are present mainly for women, suggesting that for men, the ability to control one's thoughts doesn't necessarily influence the relationship between trait self-control and positive psychological outcomes.

Our results fit in with recent reasoning about *effortless* self-control (e.g. Gillebaart and De Ridder 2015) and the role of habits in explaining the link between self-control and (health) behaviors: '[...] self-control may be particularly related to the forming of adaptive routines or habits rather than the ability to control oneself in specific situations' (Adriaanse et al. 2014, p.1). Based on our results that thought control is a significant mediator, we would like to extend this reasoning by also including the ability to effortlessly control one's thinking patterns – and especially the ability to keep unwanted, distracting, or negative thoughts from disrupting one's current goals – as part of the reason why individuals with high trait self-control report more positive outcomes in life. Interestingly, Adriaanse et al. (2014) also report that self-control mainly operates through the avoidance of maladaptive habitual behaviors, rather than the creation of adaptive habits. Here, we report a similar trend: The effect of thought control ability on the use of maladaptive coping strategies was stronger than the effect on adaptive coping strategies.

Implications and Limitations

All in all, the findings of the current research are promising and extend the literature on trait self-control and positive psychological functioning. Moreover, the findings offer some implications for practice. Specifically, our findings suggest that intervention programs aimed at increasing self-control with the goal of increasing psychological functioning should also incorporate a focus on thought control ability. One way to achieve increased thought control ability could be by including components of meditation practice or mindfulness training. After all, the main focus of meditation practice is not about controlling which thoughts arise, but about whether one pays *attention* to these thoughts (Friede et al. 2012). Further, research has shown that meditation or mindfulness training can reduce reactivity to repetitive thinking (Feldman et al. 2010), and that increased meditation experience is positively associated with perceived thought control ability, which in turn is associated with well-being (Gootjes and Rassin 2014). Given the often counter-productive and negative effects of thought suppression ("not thinking about a certain thought"), which ironically may cause hyper-accessibility the suppressed thoughts (Wegner et al. 1987), achieving more effective thought control strategies is important; especially for vulnerable individuals such as trauma victims or those suffering from emotional disorders (e.g. Purdon 1999).

There are some limitations to the current research which have to be noted. First, the research reported here is cross-sectional, which does not allow for causal conclusions.

Although we suggest that higher self-control increases thought control ability, which in turn increases positive psychological outcomes (for women, in particular), future experimental or longitudinal studies need to establish whether this is indeed a causal chain of effects. Moreover, we found some interesting gender differences, and future research could focus on determining the underlying – if any – mechanisms between trait self-control and positive psychological outcomes for men, since our mediation effects were mainly present for women. Since rumination and depression occurs more frequently among women than among men (Johnson and Whisman 2013), and men scored higher than women on thought control ability in the current research, it could be that for men, other variables than thought control ability might explain how trait self-control positively influences well-being. Examples of such mediating variables could be a sense of personal agency, or control, over the direction one's life is taking (i.e. self-efficacy; Bandura 1992), or a higher general self-esteem (see e.g., Moksnes and Espnes 2012).

Another limitation is the conceptual overlap between trait self-control and thought control ability, since both constructs center on a sense of control. However, the bivariate correlations suggest that although some variance is shared between these variables ($r = .25$ in Study 1, and $r = .47$ in study 2), there is also a considerable amount of variance that is not explained by the overlap between these variables, suggesting that these are related but separate constructs.

Conclusion

While increasing evidence shows that trait self-control is associated with a number of positive life outcomes, the understanding of the processes underlying these associations still needs to be enhanced. Our study demonstrated that the ability to control one's thinking patterns may be one of the possible mechanisms through which people, especially women, with high trait self-control experience positive psychological functioning, such as subjective well-being and coping. These results provide starting points for intervention programs that aim at increasing psychological functioning, by suggesting that a focus on thought control ability could be incorporated. Such thought control training may be helpful to keep unwanted, distracting, or repetitive negative and positive thoughts from disrupting one's current goal pursuits, and thereby promote healthy psychological functioning.

Code Availability not applicable.

Authors' Contributions KM and PB contributed to the conception and design of the study; PB contributed to data collection; KM, PB, and XS performed the statistical analysis; KM wrote the first draft of the manuscript; PB and XS wrote sections of the manuscript. All authors contributed to manuscript revision, read and approved the submitted version.

Data Availability Upon acceptance of this manuscript, all materials and data will be made publicly accessible via the Open Science Framework; <https://osf.io/pfm8h/>

Compliance with Ethical Standards

Conflicts of Interest/Competing Interests The authors declare no competing interests.

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