

**Engaging in Mental Contrasting Before Receiving a Persuasive Message:
Effects on Attitude Change**

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MENTAL CONTRASTING AND PERSUASION

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Prüfungsausschuss

Prof. Dr. Alexander Redlich (Vorsitzender)

Prof. Dr. Gabriele Oettingen (1. Dissertationsgutachterin)

Prof. Dr. Rosemarie Mielke (2. Dissertationsgutachterin)

Prof. Dr. Juliane Degner (1. Disputationsgutachterin)

Dr. Timur Sevincer (2. Disputationsgutachter)

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Abstract

Mental contrasting is a self-regulation strategy in which fantasies about a positive future are juxtaposed to images of the relevant obstacles in the present reality (Oettingen, 2012). The current research investigated whether engaging in mental contrasting before receiving a persuasive message effects attitude change. We present three empirical studies, in which participants did not fantasize (control), indulged, or mentally contrasted about fulfilling an interpersonal wish (Study 1), an achievement wish (Study 2), or a graduation wish (Study 3). Thereafter, the participants received a persuasive message regarding the implementation of new foster care policies (Study 1, Study 2; Briñol, Petty, & Barden, 2007), or a senior comprehensive exam (Study 3; Petty & Cacioppo, 1979). The persuasive message was supported by either weak or strong arguments. A general pattern emerged, showing that participants in the control and indulging conditions were dependent on argument quality; they reported significantly more favorable attitudes when presented with strong arguments than with weak arguments. As hypothesized, participants who engaged in mental contrasting were less dependent on the quality of the arguments. In all three studies, they reported attitudes that did not significantly differ between participants who received strong arguments and those who received weak arguments. The theoretical and practical implications for mental contrasting and persuasion are discussed.

Engaging in Mental Contrasting Before Receiving a Persuasive Message:

Effects on Attitude Change

Fantasizing about the future, specifically about future goals and wishes, can be used as an effective self-regulation strategy to commit to and achieve these goals. However, research has shown that this is only true when using the strategy of mental contrasting; in which fantasies about a desired positive future are contrasted to images of the relevant obstacles in the current reality (Oettingen, Pak, & Schnetter, 2001; Oettingen, 2012). Mental contrasting is a problem-solving strategy that activates expectations of success, resulting in enhanced goal commitment and goal achievement (Oettingen, 2012). The effects of mental contrasting on goal commitment and achievement have been applied across a wide variety of domains. However, the effect of mental contrasting on persuasion and attitude change is an area that has been left relatively unexplored. The self-regulation strategy of mental contrasting, which usually focuses on attaining desired personal goals, envisioning future outcomes, and identifying individual obstacles, is seemingly unrelated to persuasion and attitude change. However, mental contrasting offers a distinctive way of thinking about goals; it involves complex motivational and cognitive processes, alters the way information is processed, and fosters both obstacle identification and cognitive flexibility (Oettingen, 2012; Oettingen, Marquardt, & Gollwitzer, 2012). Furthermore, engaging in mental contrasting has also been shown to have consequences for goals and tasks beyond those of the immediate wish (Johannessen, Oettingen, & Mayer, 2012; Oettingen & A. Kappes, 2009). Mental contrasting could therefore result in a distinctive interpretation of persuasive messages and correspondingly influence attitude change.

Accordingly, the current research investigated whether engaging in mental contrasting before receiving a persuasive message effects attitude change. Specifically, we explored whether mental contrasting about an idiosyncratic wish affects a subsequent task, in which participants

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receive a persuasive message and report their attitudes. We drew on the method commonly used within the elaboration likelihood model of persuasion, in which participants are presented with a persuasive message supported by arguments that are classified as either weak or strong (Petty & Cacioppo, 1986). The current research examined whether engaging in mental contrasting influences attitudes differently depending on whether they received weak or strong persuasive messages.

The first part of the current work reviews the fantasy realization theory, in which the strategy of mental contrasting is embedded. Thereafter, the topic of persuasion and attitude change is introduced, with a major focus on the elaboration likelihood model and the accompanying method of varying argument quality. Based on these two lines of research, we hypothesized what effect engaging in mental contrasting before receiving a persuasive message will have on attitude change. We then present three empirical studies that were conducted to investigate the predicted effect. In the last part, we discuss the implications, limitations, and future directions of the current research.

Fantasy Realization Theory

Fantasy realization theory (Oettingen, 1997a, 2012) identifies four self-regulation strategies that influence goal commitment and achievement; namely, mental contrasting, indulging, dwelling, and reverse contrasting. Mentally contrasting about a goal or future wish (e.g., applying for a new job), begins with positively fantasizing about achieving the wish, imagining the best outcome of the wish coming true (e.g., engaging in novel tasks). Then thought is given to the present reality, and obstacles which stand in the way of achieving the wish are considered (e.g., not having an updated curriculum vitae). In comparison, people who indulge in their future wish merely fantasize about the best outcome of their wish coming true, without thinking of the present reality. Similarly, those who engage in dwelling only acknowledge the

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current reality that stands in the way of fulfilling their wish and do not think about the positive future that could be attained. Lastly, in reverse contrasting one first thinks of the obstacle in the reality and then fantasizes about the future.

Of the four strategies, only mental contrasting has been found to be a problem-solving strategy that helps discriminate between feasible and unfeasible goals (Oettingen, 2012). Feasibility depends on a person's judgement of whether they are capable of performing the necessary goal-directed behaviors (i.e., self-efficacy expectations; Bandura, 1977), the belief that their behaviors will result in the appropriate outcome (i.e., outcome expectations; Bandura, 1977), or a general judgement of whether attaining the desired outcome is likely (i.e., generalized expectations; Oettingen, 1996). Goal desirability, which is defined as the attractiveness of the likely consequences of goal attainment, and goal feasibility are two important attributes which help determine goal choice (Oettingen, & Gollwitzer, 2001). Importantly, mental contrasting does not change the feasibility or the desirability of a goal, but rather activates the relevant expectations for attaining the goal.

When people mentally contrast, they realize that they need to take action and invest the right amount of effort and energy to fulfill their wish. Expectations of attaining the future are activated, altering goal commitment and hence cognitive, emotional, and behavioral striving towards the desired future. If expectations of successfully achieving the goal are high, people will strongly commit to the goal, which in turn leads to higher goal attainment. However, if expectations are low, people will refrain from investing effort and energy into reaching their goal. They will disengage and pursue alternative goals for which they have a higher chance of attainment. The three other strategies (i.e., indulging, dwelling, and reverse contrasting) do not result in the realization that action and effort is needed to achieve a goal. Expectations of success are not activated and the discerning of feasible and unfeasible goals does not take place. People

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using these strategies thus remain at a moderate (unchanged) level of goal commitment; they neither fully commit to feasible goals nor actively let go of unfeasible goals. These underlying differences have resulted in numerous studies showing that mental contrasting is more beneficial for goal commitment and achievement, compared to the other three strategies (for reviews see Oettingen, 2012, 2014).

Effects of Mental Contrasting

The effects of mental contrasting on goal commitment and achievement have been replicated across a wide variety of domains and regarding diverse subject matters. The effects have been assessed with self-report (e.g., goal commitment, goal initiation) and observations (e.g., weight loss, grades), either directly after engaging in mental contrasting or weeks later (Oettingen, 2012). These measures have emphasized the changes in affective, cognitive, and behavioral indicators after engaging in mental contrasting (Oettingen, 2012). Furthermore, the effects of mental contrasting have been investigated when experimentally induced, taught as a (meta-cognitive) strategy, or generated spontaneously.

Inducing mental contrasting. In experimental settings, participants receive instructions that induce the self-regulation strategies by guiding them through the different steps. With this method, mental contrasting has successfully been applied in many areas, including health related wishes, such as reducing cigarette consumption (Oettingen, Mayer, & Thorpe, 2010) and promoting physical activity (Sheeran, Harris, Vaughan, Oettingen, & Gollwitzer, 2013). It has also been shown to increase tolerance (Oettingen, Mayer, Thorpe, Janetzke, & Lorenz, 2005), promote integrative bargaining (Kirk, Oettingen, & Gollwitzer, 2011), and encourage help seeking and giving (Oettingen, Stephens, Mayer, & Brinkmann, 2010). Likewise, it has helped with balancing work and family life (Oettingen, 2000), and improve academic performance (Oettingen, et al., 2001).

Teaching mental contrasting. The advantages of mental contrasting have not only been shown with experimental laboratory studies but also with intervention studies, in which mental contrasting was taught to participants. Having interventionists teach the strategy of mental contrasting to children has been found to positively influence their academic achievement (A. Gollwitzer, Oettingen, Kirby, Duckworth, & Mayer, 2011; Duckworth, Kirby, Gollwitzer, & Oettingen, 2013). Notably, an intervention study aimed at promoting healthy eating, showed that the effects of mental contrasting with implementation intentions (a goal striving self-regulation strategy) lasted for up to two years later (Stadler, Oettingen, & Gollwitzer, 2010). Although mental contrasting was just taught in one session at the beginning of the intervention, it had been effectively carried over and re-applied during the two years. The authors attributed the ability of mental contrasting to maintain and renew commitment, as well as helping participants adapt to new situations, as the driving factor behind the continuous success of healthy eating. Mental contrasting has also been taught as a metacognitive strategy, which in one study led health care managers to more effectively manage their time and decision making (Oettingen, Mayer, & Brinkmann, 2010). A recent study by Oettingen, H. Kappes, Guttenberg, and Gollwitzer (2015) found that teaching mental contrasting with implementation intentions as a metacognitive strategy, resulted in participants reporting better time management (Study 2) and fewer absent days from a vocational program (Study 3).

Spontaneous mental contrasting. Although the majority of studies guide participants into mentally contrasting with instructions, research has also shown that people can spontaneously use the strategy. Sevincer and Oettingen (2013) found that when they let participants freely elaborate about their current wish between 9% and 27% spontaneously mentally contrasted (Study 2 and study 3, respectively). Furthermore, spontaneous mental contrasting resulted in the previously found expectancy dependent goal commitment and

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achievement, which was not observed in the other modes of thought. In six studies investigating the effect of mood on spontaneous (self-initiated) mental contrasting, H. Kappes et al. (2011) found that a sad mood, compared to a happy or neutral mood, resulted in more participants mentally contrasting. Sevincer, Schlier, and Oettingen (2015) found that ego depletion results in a lower use of spontaneous mental contrasting. However, priming thoughts about the future and the reality, as well as confronting participants with a goal-relevant task, counteracted the depletion and increased the use of spontaneous mental contrasting.

Processes of Mental Contrasting

Both motivational and cognitive processes have been identified as vital mediators in the effectiveness of mental contrasting. Furthermore, mental contrasting is also considered to promote cognitive flexibility and alter information processing.

Motivational processes. Mental contrasting activates expectations of success and guides the amount of effort devoted to pursuing goals, thus energization was investigated as a potential motivational process (Sevincer & Oettingen, 2015). Energization does indeed mediate the effect of mental contrasting; participants who mentally contrasted showed a change in energization in an expectation dependent way, measured via self-report and systolic blood pressure (Oettingen, et al., 2009). This increased energization for feasible goals likely prepares those who mentally contrasted to pursue the goal and overcome the obstacles. The decreased energization brought about when expectations of success are low, help those who mentally contrasted not invest effort into an unattainable goal, thus saving it for more feasible ones. Additionally, it was even found that the physiological energization elicited by mental contrasting transfers to effort in subsequent tasks (Sevincer, Busatta, & Oettingen, 2014).

Cognitive processes. In addition to motivational process, studies have identified a number of cognitive processes underlying the effectiveness of mental contrasting. Using a primed

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lexical decision task, A. Kappes and Oettingen (2014) found that mental contrasting increases the strength of association between the future and the current reality. Mental contrasting creates a preliminary proposition that the future can only be achieved by overcoming the reality, and that expectations provide the relevant information for testing the validity of this proposition. Only in the mental contrasting condition did future–reality associations mediate the effects of expectations on goal commitment. Mental contrasting also leads to expectancy dependent associations between the current reality and the relevant instrumental means to attaining the desired future (A. Kappes, Singmann, & Oettingen, 2012). This association was found to mediate the effects of commitment on actual performance.

Lastly, when paired with high expectations of success, mental contrasting fosters implicit obstacle identification (A. Kappes, Wendt, Reinelt, & Oettingen, 2013). In two studies, participants who mentally contrasted and had high expectations of success evaluated their named reality aspect as more negative, as compared to participants in the control conditions. The indicators of obstacle identification mediated the effects on feelings of responsibility for reaching the desired future. Interestingly, a third study showed that mental contrasting with high expectations prepared participants to detect new obstacles in their environment. Mental contrasting results in the investment of time and effort into generating obstacles, relevant evidence and more pieces of information are considered (Grant, Oettingen, Gollwitzer, & Schneider, 2008, as cited in Oettingen & Stephens, 2009).

Cognitive flexibility. Although currently no findings can speak for a mediating effect of cognitive flexibility, as this has not been specifically tested for, the notion that mental contrasting fosters flexible thinking is prevalent (Oettingen, et al., 2012). Oettingen et al. (2012) identified a set of studies that support the view that mental contrasting with high expectations fosters cognitive flexibility. For one, mental contrasting promotes goal-directed planning (Oettingen, et

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al., 2005; Oettingen et al., 2001), and a reinterpretation of the environment in a goal-directed manner (A. Kappes, et al., 2013; Oettingen et al., 2001). Furthermore, engaging in mental contrasting stimulates new insights with regard to opportunities to act (Adriaanse et al., 2010; Oettingen, Mayer, & Brinkmann, 2010), and using uncommon means to reach a goal (Oettingen, Stephens, Mayer, & Brinkmann, 2010). Moreover, mental contrasting fosters creative performance after positive feedback (Oettingen et al., 2012), encourages the discrimination amongst unfeasible and feasible new options, and promotes the recognition of alternative outcomes to an agreement (Kirk, et al., 2011). Furthermore, mental contrasting is considered a mindful strategy (Gantman, Gollwitzer, & Oettingen, 2014). Mindfulness is defined as the process of drawing novel distinctions, which can result in diverse outcomes, such as showing greater sensitivity to the current environment, being more open to new information, creating new categories for organizing new perceptions, and enhancing awareness of multiple perspectives (Langer & Moldoveanu, 2000).

Processing of negative feedback. Additionally to the implicit cognitive changes and cognitive flexibility, engaging in mental contrasting also alters the way in which information is processed. A. Kappes, Oettingen, and Pak (2012) set out to investigate whether mental contrasting affects the way successive task feedback is processed. Participants first mentally contrasted, indulged, or dwelled about an interpersonal wish (Study 1) or about problem solving in teams (Study 2). Participants then received both positive and negative bogus feedback to a social competence test (Study 1) or from team members (Study 2). The results showed that in all fantasy conditions positive feedback was processed superiorly over negative feedback; however, negative feedback was processed in line with expectations only in the mental contrasting condition. Thus, mental contrasting strengthens goal pursuit even when confronted with adversity and results in alternative processing of goal-relevant information.

Transfer Effects of Mental Contrasting

While conducting their research on the effects of mental contrasting and the processing of feedback, Oettingen and A. Kappes (2009) evaluated the possibility that the effects of mental contrasting may transfer across tasks and life domains. This seemed plausible as participants who mentally contrasted about an interpersonal wish, later showed expectancy-dependent self-views of general social competence, as well as reporting success of general goal attainment (Oettingen & A. Kappes, 2009). Oettingen and A. Kappes (2009) further theorized that the energy mobilized by mental contrasting may transfer to subsequent tasks, and that the expectancy-dependent planning induced by mental contrasting may transfer in a similar way to planning mind-sets. Along these lines, we use the term transfer effect to describe any resulting consequences that fall beyond the wish to which mental contrasting was applied to.

The idea that energy mobilized by mental contrasting could transfer to subsequent tasks, was later confirmed by Sevincer et al. (2014). In Study 1 participants did not fantasize (control), indulged, or mentally contrasted about writing a graduate admission essay and then squeezed a handgrip for as long as possible. In Study 2 participants mentally contrasted, indulged, dwelled, or reverse contrasted about performing well on an intelligence task and then wrote a get-well letter. Participants who mentally contrasted in the first task performed better in the second task, when they had high expectations of success. This pattern was not observed for participants who indulged, dwelled, reverse contrasted, or did not fantasize. The (subjectively) improved performance on the second task was found to be mediated by energization, measured by changes in systolic blood pressure.

Johannessen et al. (2012), hypothesized that not only would mental contrasting about a dieting wish lead to changes in diet, but that there would be a transfer effect leading to changes in physical activity. Not surprisingly, participant who mentally contrasted, compared to those who

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indulged or were in the control condition, consumed fewer calories, less high-calorie food, and more low-calorie food. However more interestingly, they found that participants in the mental contrasting condition also improved their physical activity (e.g., engaging in more yoga, soccer, etc.). This speaks for a transfer effect, as participants mentally contrasted about one wish, which had a subsequent influence on another behavior which was not the core wish to which mental contrasting was applied to. Johannessen et al. (2012) list a multitude of possible reasons for the observed effects in their study. They speculate that engaging in mental contrasting could have resulted in the generation of if-then plans, a transfer of energization, and a motivational ‘spill over’. Furthermore, they state that there is a possibility that participants learned the strategy and became proficient in applying it to other domains. However, procedural priming and mind-set processes were also speculated as possibly involved factors.

Pak, A. Kappes, and Oettingen (2008, Study 4, as cited by Oettingen & A. Kappes, 2009) empirically investigated the transfer effect of mental contrasting by using an unrelated-task paradigm. Participants were asked to name an interpersonal wish and then either mentally contrasted, indulged, or dwelled on this wish. Thereafter they were presented with the most difficult set of Raven’s Progressive Matrices (a test measuring reasoning abilities). In line with the authors’ hypothesis of a transfer effect, the participants in the mental contrasting condition achieved the best scores when expectations of success were high, and the worst scores when expectations of success was low. Participants in the indulging and dwelling conditions did not show this expectation dependency and demonstrated moderate levels of performance. The authors state that mental contrasting was able to induce cognitive processes that were strong enough to benefit the solving of difficult tasks. Although the study did not explicitly examine which cognitive processes affected performance, the authors propose processing of negative feedback, sustaining a positive self-view, and optimistic attributions may all have led to the

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observed performance. In light of the results which show an expectancy dependent performance on the test, it also seems conceivable that increased (versus decreased) energization resulting from mental contrasting drove the performance effect.

Lastly, in their study which aimed to prove that mental contrasting fosters thorough obstacle consideration, Grant, et al. (2008, Study 1, as cited by Oettingen & Stephens, 2009) had participants mentally contrast, indulge, or dwell about a leisure activity (e.g., finding time for hobbies). Participants were then instructed to name important wishes in other life domains (e.g., health, interpersonal) and list obstacles relevant to those wishes. Participants who had mentally contrasted about the leisure activity, spent more time generating obstacles for the other wishes, than participants who had indulged or dwelled. Hence those who engaged in mental contrasting in one domain transferred the cognitive procedure and were able to more carefully consider obstacles in other domains.

Summary

In the previous section, we outlined the theory of fantasy realization, including the effects of mental contrasting and the mediating motivational and cognitive processes involved. Furthermore, we brought evidence that mental contrasting fosters cognitive flexibility and alters goal-related information processing. Lastly, four diverse sets of studies have given light to the idea that engaging in mental contrasting can have a transfer effect on subsequent goals and tasks. To our knowledge, the combination of mental contrasting with persuasion and attitude change has been relatively unexplored. However, considering the previously outlined literature it is plausible that engaging in mental contrasting can influence the approach used to interpret subsequent persuasive messages, and the formation of alternate attitudes.

Persuasion and Attitude Change

Attitudes are defined as a broad range of evaluations people have about others, themselves, objects, and issues, which are capable of influencing affective, cognitive, and behavioral processes (Petty & Cacioppo, 1986). In line with Bohnert, Erb, and Siebler (2008), we view attitudes as temporary constructions that are generated at the time when an evaluative judgment is needed. With this perspective, attitude change and formation are not considered conceptually different (Schwarz & Bohnert, 2001, as cited by Bohnert, et al., 2008). Persuasion focuses on the formation or change of attitudes, which typically occurs in response to a message about the attitude object (Bohner, et al., 2008). Although many models of attitude change have been proposed, dual-process models remain the most influential persuasion paradigms to date (Crano & Prislín, 2006; Chaiken, 1980; Kruglanski & Thompson, 1999; Albarracín, 2002). For the purpose of our investigation, the current research drew upon the elaboration likelihood model (Petty & Cacioppo, 1986), which is one of the most established dual-process models in persuasion research.

Elaboration Likelihood Model

The elaboration likelihood model (ELM) states that attitudes may be changed with either a relatively low or a high amount of thought (Petty & Cacioppo, 1986). This idea refers to the concept of an elaboration continuum; the term *elaboration* refers to the extent to which a person thinks about the arguments contained in the persuasive message, and is synonymous with the degree of thought or message scrutiny (Krosnick & Petty, 1995). According to the ELM, when attitude changes due to a low amount of thought (i.e., low end of the elaboration continuum), persuasion is said to have followed a *peripheral route*. When attitude changes because of a high amount of thought devoted to the persuasive message (i.e., high end of the continuum), persuasion follows a *central route*. Both the motivation and the ability to process the

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information of the persuasive message needs to be present in order for persuasion to follow a central route; if either one or both are absent, attitude change will follow a peripheral route (Petty & Cacioppo, 1986). The most well documented variables that influence motivation include personal involvement (Petty & Cacioppo, 1979), personal responsibility (Petty & Cacioppo, 1979), and need for cognition (Cacioppo & Petty, 1982). The ability to process the persuasive message depends on variables such as distraction, repetition, and message comprehensibility (Petty & Cacioppo, 1986). Motivation and ability may not only influence the amount of thinking (objective elaboration), but also facilitate specific negative or positive cognitive responses (biased elaboration).

The ELM states that variables are allocated three roles in the persuasion process: they may be considered as arguments, as peripheral cues, or as factors affecting the valence of thoughts. Depending on the persuasive context and overall elaboration likelihood, the same variable may have multiple roles; the variable may be a peripheral cue (if elaboration likelihood is low), or affect the motivation and/or ability to increase the amount of thought (if elaboration likelihood is middle ranged). If elaboration likelihood is high, the variable may be considered as an argument, but also has the potential to influence the valence or structural features of thoughts (Petty & Briñol, 2012).

Lastly, the ELM states that the route taken to persuasion has different consequences for temporal persistence, resistance, and behavior (Petty & Cacioppo, 1986). An attitude which results from a higher amount of thought persists longer over time, is harder to change, and shows a better attitude-behavior correlation than when an attitude stems from a lower amount of thought (Petty & Cacioppo, 1986). In recent years, research on meta-cognitions have expanded the ELM and shed light on previous findings (Petty, Briñol, Tormala, & Wegener, 2007).

Argument quality. With the establishment of the ELM, Petty and Cacioppo (1986) introduced a novel approach to investigate persuasion and attitude change, by using argument quality as a methodological tool. Argument quality appears to be the most frequently manipulated message feature in persuasion research (Johnson, Maio, & Smith-McLallen, 2005), and the innovation of systematically varying quality has played a major role in detecting the effects of numerous variables on attitude. Within the ELM, *arguments* are defined as pieces of information contained in the persuasive message that are important for a person's subjective establishment of the true merits of an advocated position (Petty & Cacioppo, 1986). In its simplest variation, research studies employing the use of argument quality, present participants with a persuasive message that is supported by either weak or strong arguments. With this method, the message still advocates the same issue or position but is differentially persuasive due to the supporting arguments.

The ELM states that when devoting a high amount of thought to the persuasive message, the majority will report attitudes that are strongly dependent on the quality of the presented arguments (Petty & Cacioppo, 1986). This idea is also reflected in other persuasion models (e.g., in the heuristic-systematic model, Chaiken, 1980). When devoting a high amount of thought to a message, participants will detect the quality of the arguments (weak or strong) and base their attitudes accordingly. Strong arguments will result in the formation of primarily favorable thoughts and attitudes, thus leading to persuasion. Weak arguments induce primarily unfavorable thoughts and attitudes, thus the attitude remains unchanged or may even boomerang. A boomerang effect describes the event in which the recipient of the message forms attitudes that are the opposite of the one advocated in the message (Petty & Cacioppo, 1984; Petty, Cacioppo, Strathman, & Priester, 2005; Knowles & Linn, 2004). In sum, under high amount of thinking attitudes will conform to the quality of the presented arguments (for meta-analyses see Johnson,

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Smith-McLallen, Killea, & Levin, 2004; Carpenter, 2015). However, the ELM does not specify what qualities make an argument persuasive, what characteristics define a strong or weak argument, or what individual differences may exist. Instead, the ELM defines argument quality empirically, specifying arguments that the vast majority of the target population finds compelling (strong) or specious (weak).

Operationalization of argument quality. Petty and Cacioppo (1986) propose the following procedure for operationalizing argument quality in research studies. Strong and weak arguments are developed by initially generating a large number of arguments; these arguments range from very compelling to very specious. Strong arguments usually cite statistics and relevant studies, while weak arguments rely more on quotations and opinions (Petty & Briñol, 2012; Petty & Cacioppo, 1979). These arguments are then rated for persuasiveness by the appropriate target population, and based on these scores arguments are defined as strong or weak. Both strong and weak arguments support the proposed advocacy, yet the strong arguments are just more compelling and weak arguments more specious. Different participants from the same population then receive the persuasive messages, containing either the weak or the strong arguments. They are told to evaluate and think about the message carefully, which induces a high amount of thought. Participants complete a thought-listing measure, in which they record all thoughts that occurred to them while reading the message. These thoughts are coded as favorable, unfavorable, or neutral to the proposed issue. Messages are then defined as *strong* when they contain arguments that predominantly result in favorable thoughts by participants who have devoted a high amount of thought. Conversely, *weak* messages contain arguments, to which the majority of participants generate predominantly unfavorable thoughts. In summary, when devoting a high amount of thought to a persuasive message, the favorability of thoughts and thus attitude will depend on the quality of the contained arguments.

Interpretations beyond argument quality. At first glance, it may seem reasonable that attitudes are guided by the quality of the presented arguments. However, thinking about it more critically one may come to appreciate that it is by no means so simple. Weak arguments for an issue do not necessarily mean that the issue is unreasonable, or that good arguments for the issue do not exist. For example, research by Akhtar, Paunesku and Tormala (2013) found that under pro-attitudinal conditions the presentation of weak arguments stimulates advocacy, as these arguments elevate participants' perceived ability to make the case stronger. Thus, a message supported by weak arguments could still induce favorable thoughts and attitudes when self-constructed strong arguments are generated. In a similar vein, strong arguments do not necessarily imply that the issue is reasonable or feasible; a rationale for opposing the implementation could be found. Thus, unfavorable thoughts and attitudes towards the underlying issue can still ensue, although supported by strong arguments. At face value it may appear that the arguments convey all the information one needs to form a judgment; however, upon closer inspection one may become aware of alternative interpretations and perspectives.

For illustrative purposes, consider a participant who is presented with a message proposing that in future foster parents should have multiple children in their homes. The message is supported by a weak argument, which states that the presence of siblings is beneficial, as the children will have someone else to fight with. Instead of forming an unfavorable attitude in reaction to the weak argument, the participant might overwrite this by establishing a strong argument. For example, having siblings is beneficial, as the children will have someone else to play with and learn from. In another instance, the message could be presented with a strong argument, stating that having siblings aids the social development of foster children. Instead of forming a favorable attitude in reaction to this strong argument, the participant might think about the consequences of the proposal. For example, it may lead to less foster parents accepting

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children, as they do not have the capacity to care for more than one child. In such cases, the participant presented with the weak argument could still form a favorable attitude, while the one presented with the strong argument could form an unfavorable attitude, when interpreting the message from a different perspective.

Our main notion is that a persuasive message can be coated in either weak or strong arguments, but instead of an immediate influence on attitude it might also trigger different thoughts and interpretations altering expected attitude change. Thus, we argue that under certain circumstances participants may not be as strongly influenced by the argument quality, but form alternative judgments of the message at hand. Interpreting the message in a different way, taking another perspective, and looking past the immediate salience of the arguments, can overcome the formation of attitudes that are heavily conform on argument quality.

Summary

Above we provided a short overview to the ELM, and their hailed method of varying argument quality to investigate persuasion and attitude change. According to the ELM, a high amount of thought to the persuasive message should result in the conformity with argument quality. However, we propose that there are certain conditions in which a high amount of thought may result in a different interpretation of the persuasive message, one that is not solely influenced by the quality of the contained arguments. We propose that engaging in mental contrasting before receiving a persuasive message, may foster message interpretations that reach beyond the argument quality.

Mental Contrasting and Persuasion

The aim of the current research was to investigate whether *engaging in mental contrasting before receiving a persuasive message effects attitude change*. Specifically, we explored whether mentally contrasting about an idiosyncratic wish will influence attitude change after receiving

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either weak or strong persuasive messages. Research has shown that the majority of participants who invest a high amount of thought into a persuasive message form attitudes in accordance with the quality of the presented arguments. We however hypothesized that engaging in mental contrasting before receiving a persuasive message leads to attitudes that are not as strongly influenced by the quality of the presented arguments. Previously outlined research has shown that mental contrasting alters cognitive processes, changes information processing, and additionally can have a transfer effect onto subsequent goal-irrelevant tasks. Considering these lines of work, we postulated that engaging in mental contrasting could influence the approach used to interpret subsequent persuasive messages. Although usually goal directed, engaging in mental contrasting fosters cognitive flexibility and implicit obstacle identification in the environment. Thus after engaging in mental contrasting a subsequent task, such as forming an attitude from a persuasive message, could be approached with cognitive flexibility and a readiness to detect obstacles. This in turn may lead to an alternate interpretation of the persuasive message, inducing a divergent attitude that extends beyond the salience of the argument quality. In sum, we expected that participants who engage in mental contrasting and devote a high amount of thought to the persuasive message, will form attitudes that are less dependent on the quality of the presented arguments.

Overview of the Studies

To prove the hypothesis that engaging in mental contrasting before receiving a persuasive message effects attitude change, we conducted three studies. In Study 1 and Study 2, participants first specified their wish, and in Study 3 they personalized a pre-defined wish. Participants were randomly assigned to either a mental contrasting, indulging, or no fantasizing (control) condition, and elaborated their wish accordingly. Thereafter participants received a persuasive message proposing a new implementation, supported by either weak or strong arguments. Attitudes

towards the new implementation were assessed and participants engaged in a thought-listing measure.

Study 1: Interpersonal Wishes and Foster Care

Study 1 was an online study, in which participants began by naming an interpersonal wish. We then manipulated the self-regulation strategies; participants mentally contrasted, indulged, or did not fantasize (control) about their wish. Interpersonal wishes have successfully been used in previous studies and participants easily formulate such wishes and elaborations (Oettingen, et al., 2001; Oettingen, et al., 2009). Thereafter, participants received a persuasive message in the form of an editorial, which proposed the implementation of new foster care policies (Petty, Schumann, Richman, & Strathman, 1993; Wegener, Petty, & Smith, 1995; Briñol, et al., 2007). We opted for this topic, as the majority of participants, irrespective of demographics, should have enough (layman) knowledge to easily grasp the idea. Knowledge of an issue is also required for participants to be able to process the presented arguments (Wood, Kallgren, & Priesler, 1985). Two versions of the editorial existed: one containing three weak arguments and another three strong arguments. Before conducting the current study, we piloted the material and as expected found that the majority of participants who received the strong arguments reported attitudes that are more favorable, listed more positive thoughts, and rated the arguments as more convincing, compared to those who received weak arguments. We hypothesized that in the current study we would find the same results for participants who previously indulged and those who did not fantasize about their wish. However, we expected that in the mental contrasting condition, attitudes and thoughts would not be as strongly influenced by the quality of the arguments. Furthermore, we added an argument quality check in the current study, aiming to prove that in the mental contrasting condition, strong arguments are still evaluated as more convincing than weak arguments, yet do not sway the attitudes. As an

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explorative measure, the amount of processing participants engaged in while reading the persuasive message was added.

Method

Participants and design. In total 474 participants began the online study; however, 112 dropped out before completion. We excluded two participants as there was loss of data due to a computer glitch, two more as they did not complete the study in one sitting (as indicated by the timestamp), and seven participants who did not have English as their mother tongue. We included two attention check questions that were used to exclude further 47 participants. Thus, our final sample consisted of 304 participants. The participants completed the online study via Amazon's Mechanical Turk (see Buhrmester, Kwang, & Gosling, 2011; MTurk), and received 0.50 USD for their participation. The participants ages ranged from 18 to 77 ($M = 37.90$ years, $SD = 13.64$), and 200 of the participants were female. The study followed a 3 (fantasy: mental contrasting, indulging, control) x 2 (argument quality: strong, weak) between-subjects factorial design. Participants were randomly assigned to one of the six conditions; the number of participants in each condition ranged from 40 to 65.

Materials and procedure. Participants completed an online consent form before beginning with the questionnaire and read a debriefing at the end of the questionnaire. Further variables were assessed in the study, which are not reported here; see Appendix A for the complete questionnaire.

Interpersonal wish. Participants began by reading a short introduction about how people have different wishes pertaining to different areas of their lives. We then instructed them to:

Think about your relationships with other people. What is the most important wish you have in one of those relationships (either romantic or non-romantic)? This wish should be

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something that is challenging yet feasible, and something that you think you can fulfill within the next three weeks.

As an example, one participant wrote, “I would like to be friend with my new co-worker and perhaps even ask her out to see a movie with me next weekend ...” Participants were then asked to indicate on two separate scales, ranging from *not at all* (1) to *very* (7), how likely and how important it is to them that their wish comes true. The likelihood represents the expectations of success (i.e., feasibility), while the importance assesses the incentive value for attaining the wish (i.e., desirability). Furthermore, they indicated how disappointed they would be if their wish did not come true, as a pre-commitment measure.

Fantasy induction. Participants in the control condition did not receive any fantasy induction and moved straight onto the next section. In the mental contrasting and indulging conditions, participants were asked, “What would be the best thing, the best outcome about fulfilling your wish? How would fulfilling your wish make you feel? Note your best outcome using 3-6 words.” The participant whose wish was previously mentioned noted, “Having a new friend” as their best outcome. Thereafter instructions to elaborate this in detail were presented:

Think about the best outcome in vivid detail and write about all the thoughts and images that come to your mind. Let your mind wander and allow these events and experiences to play out. Imagine things fully! Don't hesitate to give your thoughts and images free rein.

Take as much time as you need. Please write your thoughts and images down.

The second step differed between the indulging and the mental contrasting fantasy induction. Those in the indulging condition were asked, “What would be the second best thing, the second best outcome about fulfilling your wish? How would fulfilling your wish make you feel? Note your second best outcome using 3-6 words.” While participants in the mental contrasting condition received the following instructions, “Sometimes things don’t work out as we would

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like them to. What holds you back from fulfilling your wish? What is it within you that stands in the way of you fulfilling your wish? What is your main obstacle?” Participants were then asked to name their main obstacle in three to six words. The previously mentioned participant who was in the mental contrasting condition, noted, “Being too shy to speak with others.” In both conditions, the participants were instructed to elaborate with instructions similar to the ones specified above.

Persuasive message. Participants were informed that they would be commencing with the second part of the questionnaire. Participants read a short introduction text and then received an editorial containing either weak arguments or strong arguments (246 and 236 words, respectively). The introduction text, as well as the information and arguments presented in the editorial, were re-created and adapted from studies described by Petty and colleagues (Petty, et al., 1993; Wegener, et al., 1995; Briñol, et al., 2007). In the introduction text, participants learned that they would be reading an editorial about foster care programs and that we were interested in hearing their opinions. We further informed participants that the editorial argues that the typical state foster care program should be changed by adopting some new policies, namely those that are currently being used in Rhode Island. The editorial began with a short statement on what the purpose of foster care programs are, and then introduced the fact that foster care programs are not the same across all states. Furthermore, the readers were informed that a recent proposal suggested that three policies currently used in Rhode Island should be implemented in all states. The editorial concludes with a statement that the National Conference of State Legislatures will discuss the proposition in their next session. Table 1 lists the three policies proposed in the editorial, as well as the weak and strong arguments participants received depending on their condition.

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Table 1

The three proposed policies listed in the editorial, with both the weak and strong arguments.

Policy 1:
Children are required to stay with their foster parents until they are 18 years old rather than the customary 16 years.
<i>Weak argument</i>
The Rhode Island program believes it is important for parents to have power and authority over the foster child for as long as possible.
<i>Strong argument</i>
The Rhode Island program believes that it is important for children to have the support of their family when dealing with life's challenges.

Policy 2:
Foster parents should have multiple children in their families.
<i>Weak argument</i>
The presence of siblings would be good for foster children, so they have other children to fight with; brothers and sisters provide an ideal opportunity for this to occur.
<i>Strong argument</i>
The presence of siblings aids the social development of foster children; brothers and sisters offer an additional source of love and support for children.

Policy 3:
Foster children are required to maintain good grades and good behavior.
<i>Weak argument</i>
This will lead to them looking good to school teachers and others.
<i>Strong argument</i>
This will lead to a boost in their self-confidence.

Attitudes. After reading the editorial, participants attitudes toward the program were assessed by asking them to indicate on a 9-point scale whether they thought the adoption of the proposed foster care policies would be *good-bad*, *negative-positive*, *wise-foolish*, *unfavorable-favorable*, and *beneficial-harmful* (Wegener, et al., 1995). On two further questions, they also indicated on a 9-point scale the extent to which they *agreed-disagreed* and to what extent they were persuaded with the adoption of the proposed foster care policies (Petty, et al., 1993). The mean of the overall attitude was calculated for each participant ($\alpha = 0.97$).

Thoughts. Subsequently we asked participants to write down all the thoughts they had while reading the editorial. The thought-listing measure emphasizes how people individually

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evaluate the provided information and these thoughts are believed to drive attitude formation (Cacioppo & Petty, 1981). We used the instructions provided by Cacioppo and Petty (1981, p. 318), and only changed the text to accommodate the fact that participants read an editorial instead of hearing it. Participants had 14 empty text-boxes in which they could write their thoughts; they were however informed that they did not need to fill every box. Furthermore, participants had 5 minutes to complete their thought listing; thus, they could not proceed before the time was up, nor could they continue after this time. Later, all thoughts irrelevant to the message were removed (10.1%). The remaining thoughts were coded as favorable, unfavorable, or neutral, by two independent raters unaware of the experimental condition ($\kappa = 0.72$). Any disagreements were discussed until a uniform decision was reached.

Argument quality check. We included an argument quality check to demonstrate that strong arguments would be evaluated as more convincing than weak arguments, in all fantasy conditions. Corresponding with the study by Petty et al. (1993), we listed the three arguments supporting the proposed policies (the weak ones in the weak condition and the strong in the strong condition), and asked participants to rate how convincing they thought each argument was. We used a 15-point scale, ranging from *unconvincing* to *convincing*, and calculated a mean for all three arguments ($\alpha = 0.77$).

Amount of processing. For explorative purposes, we assessed actual and perceived amount of processing. We used the number of message relevant thoughts from the thought-listing measure and argument recall as indicators of the actual amount of processing (Barden & Petty, 2008). To assess argument recall, participants read the following instructions, “You read about three proposed foster care policies. Try to recall the arguments, or reasons behind these policies, that lend themselves as support for the proposed foster care policies. Please try to recall only what you read.” To assess the perceived amount of processing we adapted the questions used by

Barden and Petty (2008). On two 7-point scales ranging from *a little* to *a lot*, we asked participants to what extent they thought a lot about/paid attention to the information about the proposed foster care policies ($\alpha = 0.75$).

Results

Interpersonal wish. As expected the participants had moderate expectations of achieving their wish ($M = 5.07$, $SD = 1.43$), high incentive values ($M = 6.25$, $SD = 1.02$), and moderate pre-commitment ($M = 5.37$, $SD = 1.62$). We ran a Kruskal-Wallis H test to check for differences between the fantasy conditions. There were no differences between the three fantasy conditions concerning expectations of success, $H(2) = 0.25$, $p = 0.88$, incentive value, $H(2) = 2.98$, $p = 0.23$, and pre-commitment levels, $H(2) = 1.83$, $p = 0.40$, indicating successful randomization. There was a significant positive correlation between expectations and incentive value, $r(302) = 0.30$, $p < 0.00$, expectations and pre-commitment, $r(302) = 0.12$, $p = 0.03$, and incentive value and pre-commitment, $r(302) = 0.39$, $p < 0.00$.

Attitudes. We conducted a two-way ANOVA followed by planned simple contrast analyses, to investigate the effect of each fantasy condition on attitude at each level of argument quality. We found a significant main effect of the argument quality on the attitude about the new foster care policies, $F(1, 298) = 14.01$, $p < 0.00$, $\eta_p^2 = 0.05$. The mean attitude was lower when presented with weak arguments ($M = 6.19$, $SD = 2.05$) compared to strong arguments ($M = 7.04$, $SD = 1.69$). The main effect of the fantasy condition was not significant, $F(2, 298) = 0.12$, $p = 0.89$, $\eta_p^2 < 0.00$. The interaction between argument quality and fantasy condition on attitude was non-significant, $F(2, 298) = 137$, $p = 0.26$, $\eta_p^2 = 0.01$. With the planned contrasts, we found that for both the indulging and the control condition the attitude was significantly different between the weak and the strong arguments, $F(1, 298) = 5.50$, $p = 0.02$, $\eta_p^2 = 0.02$, $M_{weak} = 6.23$, $SD_{weak} = 2.11$, $M_{strong} = 7.16$, $SD_{strong} = 1.81$, and $F(1, 298) = 11.74$, $p < 0.00$, $\eta_p^2 = 0.04$, $M_{weak} = 5.97$,

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$SD_{weak} = 2.00$, $M_{strong} = 7.17$, $SD_{strong} = 1.45$, respectively. Conversely, in the mental contrasting condition the attitude did not significantly differ between the weak and the strong argument condition, $F(1, 298) = 0.74$, $p = 0.39$, $\eta_p^2 < 0.00$, $M_{weak} = 6.49$, $SD_{weak} = 2.06$, $M_{strong} = 6.82$, $SD_{strong} = 1.83$. Figure 1 depicts the mean reported attitude with regard to argument quality and fantasy condition.

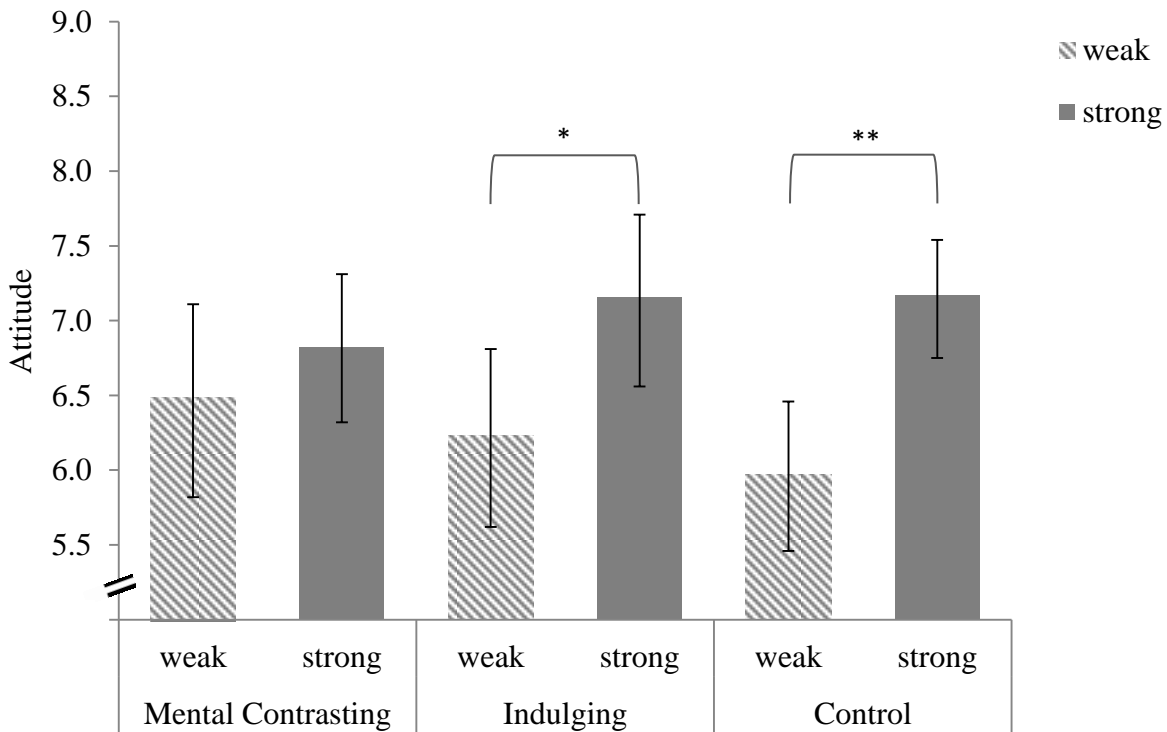


Figure 1. The effect of fantasy condition and argument quality on the reported attitude, including 95% confidence intervals. Note. $*p < .05$, $**p < .01$.

Thoughts. To obtain the thought valence, we subtracted the number of unfavorable thoughts from the number of favorable thoughts, and divided the difference by the total number of relevant thoughts (Cacioppo & Petty, 1981; Briñol, et al., 2007). Thought valence scores thus ranged from -1 (very unfavorable) to +1 (very favorable). Table 2 depicts the mean thought valence per fantasy and argument quality condition. A positive correlation was found between attitude and thought valence, $r(286) = 0.58$, $p < 0.00$.

Table 2

Mean thought valence (SD) in relation to fantasy condition and argument quality.

	Mental contrasting	Indulging	Control
Weak arguments	0.09 (0.36)	0.02 (0.45)	-0.03 (0.47)
Strong arguments	0.07 (0.43)	0.16 (0.47)	0.17 (0.37)

We conducted a two-way ANOVA and found a significant main effect of the argument quality on the thought valence, $F(1, 282) = 4.14, p = 0.04, \eta_p^2 = 0.01$. The main effect of the fantasy condition was not significant, $F(2, 282) = 0.03, p = 0.97, \eta_p^2 < 0.00$. The interaction between argument quality and fantasy condition on thought valence was also not significant, $F(2, 282) = 1.79, p = 0.17, \eta_p^2 = 0.01$. With regard to the planned simple contrast analyses on the fantasy condition, we found that in the control condition the thought valence was significantly different between the weak and the strong arguments, $F(1, 282) = 6.16, p = 0.01, \eta_p^2 = 0.02$. However, in the indulging condition we found no significant difference, $F(1, 282) = 2.21, p = 0.14, \eta_p^2 = 0.01$. As expected, in the mental contrasting condition the thought valence did not significantly differ between the weak and the strong argument condition, $F(1, 282) = 0.09, p = 0.77, \eta_p^2 < 0.00$.

Argument quality check. A (reversed) log transformation was performed on the variable before entered into the GLM and planned contrast analyses; however, for ease of interpretation the reported means are from the untransformed data. The two-way ANOVA revealed the expected significant main effect of the argument quality on the convincingness of the arguments, $F(1, 283) = 56.78, p < 0.00, \eta_p^2 = 0.17$. Weak arguments were rated as less convincing than strong arguments ($M_{weak} = 8.02, SD_{weak} = 4.07, M_{strong} = 11.63, SD_{strong} = 2.72$). The main effect of the fantasy condition and the interaction between argument quality and fantasy condition was non-significant (fantasy: $F(2, 283) = 0.57, p = 0.57, \eta_p^2 < 0.00$; interaction: $F(2, 283) = 1.55, p = 0.21, \eta_p^2 = 0.01$). The planned simple contrast analysis showed that in all three conditions the

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strong arguments were rated as more convincing than the weak arguments (mental contrasting:

$F(2, 283) = 8.47, p < 0.00, \eta_p^2 = 0.03, M_{weak} = 8.41, SD_{weak} = 4.04, M_{strong} = 10.96, SD_{strong} = 3.01$;

indulging: $F(2, 283) = 20.32, p < 0.00, \eta_p^2 = 0.07, M_{weak} = 8.06, SD_{weak} = 4.19, M_{strong} = 11.98$,

$SD_{strong} = 2.52$; control: $F(2, 283) = 33.40, p < 0.00, \eta_p^2 = 0.11, M_{weak} = 7.73, SD_{weak} = 4.04$,

$M_{strong} = 12.03, SD_{strong} = 2.46$).

Amount of processing. The actual amount of processing was assessed by the number of relevant thoughts obtained in the thought-listing measure. The overall mean number of thoughts listed by participants was 5.32 ($SD = 3.17$). A two-way ANOVA showed no significant main or interaction effects for the number of thoughts (argument quality: $F(1, 283) = 0.90, p = 0.35, \eta_p^2 < 0.00$; fantasy: $F(2, 283) = 1.11, p = 0.33, \eta_p^2 = 0.01$; interaction: $F(2, 283) = 0.93, p = 0.40, \eta_p^2 = 0.01$). Secondly, we used argument recall to assess the actual amount of processing, which revealed a rather low overall mean ($M = 1.10, SD = 1.09$). Argument recall also did not show any main effects or interaction effects (argument quality: $F(1, 298) = 2.06, p = 0.15, \eta_p^2 = 0.01$; fantasy: $F(2, 298) = 0.05, p = 0.95, \eta_p^2 < 0.00$; interaction: $F(2, 298) = 0.13, p = 0.88, \eta_p^2 < 0.00$). The perceived amount of processing was rather high ($M = 6.06, SD = 1.04$), but also did not result in any significant main or interaction effects (argument quality: $F(1, 283) = 1.65, p = 0.20, \eta_p^2 = 0.01$; fantasy: $F(2, 283) = 0.85, p = 0.43, \eta_p^2 = 0.01$; interaction: $F(2, 283) = 1.82, p = 0.16, \eta_p^2 = 0.01$). The total number of thoughts correlated positively with the perceived amount of processing, $r(302) = 0.19, p < 0.00$, and with the total number of recalled arguments, $r(302) = 0.13, p = 0.02$. However, the perceived amount of processing did not correlate with argument recall, $r(302) = 0.09, p = 0.11$.

Discussion

Our aim was to investigate whether engaging in mental contrasting before receiving a persuasive message results in attitudes that are less dependent on the quality of the presented

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arguments. In the current study, the attitudes of participants in the indulging and control condition significantly differed depending on the quality of the presented arguments. As expected, their attitudes were more favorable when they received strong arguments and less favorable when they received the weak arguments. This was not observed in the mental contrasting condition, in which the difference between the attitudes in the weak and strong argument quality conditions did not reach significance. The findings thus speak for the postulated hypothesis, that prior engagement in mental contrasting results in attitudes that are less influenced by the quality of the presented arguments. The thought-listing measure partially echoes the findings obtained with the reported attitudes. In the control condition, thoughts were more favorable when presented with strong than weak arguments. Whilst in the mental contrasting condition, the favorability of thoughts was not significantly different when receiving weak or strong arguments. Only in the indulging condition did the favorability of the thoughts not reflect their reported attitudes. Nonetheless, the thought-listing measure does yield a pattern supporting our hypothesis.

The listed thoughts also have a high qualitative value, which unfortunately is beyond the scope of the current research. Nevertheless, we found the generated thoughts revealing and depict some of these thoughts that were listed by participants in the mental contrasting condition. Participants who received the weak argument supporting the policy that children should stay in foster homes until the age of 18, wrote statements such as “Staying with parents until 18 just so they have authority over them seemed like wrong motive. To care for and guide them, sure”, or “Parents shouldn't keep kids til 18 for power and control, but for support and nurture.” When participants received the strong argument, some responded with statements such as, “When having the kids stay until 18, what if they don't like the foster parents and would rather leave at 16?”, or “This legislation could require foster children to stay in less than desirable or bad

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situations for another 2 years though.” Both sets of examples illustrate interpretations that sprung from the provided arguments that however follow a different thought process, leading to attitudes that are not as strongly influenced by the argument quality. However, as we did not conduct a qualitative analysis, we cannot say whether such thoughts are unique to participants in the mental contrasting condition. Yet they do provide us with a clue to what thought processes may occur after engaging in mental contrasting.

The argument quality check revealed that in all three conditions, strong arguments were rated as more convincing than weak arguments. All participants had the capacity to distinguish between the weak and strong arguments, but those who engaged in mental contrasting did not let this guide their attitudes. Furthermore, the observed distinction also reveals that participants in all conditions devoted a high amount of thought to the persuasive message (Petty & Cacioppo, 1986). This could also explain why the actual and perceived amount of processing did not significantly differ between the conditions. In order for participants to appropriately distinguish the argument quality, a high amount of processing or thought is required (Petty & Cacioppo, 1986). Thus, the effects of mental contrasting on attitude do not reflect a difference in the amount of thought, as this was shown to be high for all conditions. Rather this speaks for a different interpretation of the message or a change in the thinking procedure, which is not captured by the measure of amount of processing.

Study 2: Achievement Wishes and Foster Care

We conducted a second study to replicate the finding that engaging in mental contrasting before receiving a persuasive message leads to attitudes that are less dependent on the quality of the presented arguments. In this study, we had participants name an achievement related wish and accordingly elaborate depending on their assigned condition (mental contrasting, indulging, or no fantasizing). The persuasive message received afterwards was the same as in Study 1, namely the

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editorial for the new foster care policies. With a few minor alterations, we assessed attitudes, thoughts, argument quality, and amount of processing, just as in Study 1. The main change from the previous study was the replacement of the interpersonal wish with an achievement related wish. The aim was to show that the results obtained in Study 1 were not driven by the content of the wish to which mental contrasting was applied, but rather that it is the pure act of engaging in mental contrasting that produces the changes in message interpretation and altered attitudes.

Method

Participants and design. In total, 476 participants started the online study via MTurk (Turk Prime), but 99 dropped out before completing the study. The following set of participants were excluded: six participants as they did not have English as their mother tongue, 15 failed the embedded attention check, two participants responded in a nonsensical way in the open-ended questions, and one wrote that the page containing the editorial did not load. Our final sample thus consisted of 353 participants. Participants received 1.00 USD for completing the study. The age of the participants ranged from 18 to 73 ($M = 36.15$ years, $SD = 11.41$), and 199 were female. The study followed the same 3 (fantasy: mental contrasting, indulging, control) x 2 (argument quality: strong, weak) between-subjects factorial design as the previous study. Participants were randomly assigned to one of the six conditions; the number of participants in each condition ranged from 56 to 61.

Materials and procedure. Participants completed an online consent form before starting the questionnaire and received a debriefing at the end of the questionnaire. Further variables were assessed in the study, which are not reported here; see Appendix B for the complete questionnaire.

Achievement wish. As in Study 1, participants began by reading a short introduction about how people have different wishes pertaining to different areas of their lives. We then instructed participants to name an achievement related wish:

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Most people value professional or academic achievement and are often concerned about their professional or academic accomplishments. Which personal wish about your professional or academic achievement is presently most on your mind? Your wish should be challenging for you, but you should be able to resolve it within the next couple of weeks.

For example, one participant wrote, “I must update my resume so that I can apply for a new position within my firm before the opening expires.” Participants were asked to indicate on two separate scales, ranging from *not at all* (1) to *very* (7), how likely and how important it is to them that their wish comes true (i.e., expectations of success and incentive value). Furthermore, they indicated how disappointed they would be if their wish did not come true (i.e., pre-commitment).

Fantasy induction. After being randomly assigned to one of the three fantasy conditions, participants received the same fantasy instructions as in the previous study. Participants in the mental contrasting condition named and elaborated the best outcome of achieving their wish, and then named and elaborated on the obstacle standing in their way. Participants in the indulging condition named and elaborated their best and second best outcome. For example, the participants whose wish was to update their resume and apply for a new position stated “professional fulfillment” as the best outcome, and “financial independence” as the second best outcome. Participants in the control condition did not receive any further instructions regarding their wish.

Persuasive message. Participants then read that the second part of the study was starting. Participants received the same introduction and editorial as in Study 1. Participants were randomly assigned to either the editorial containing weak or strong arguments for the implementation of three new foster care policies.

Attitudes. In this study, participants indicated on a 7-point scale whether they thought the adoption of the proposed foster care policies would be *good-bad*, *negative-positive*, *wise-foolish*,

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unfavorable-favorable, and *beneficial-harmful*. They also answered, “To what extent do you agree/disagree with the adoption of the proposed foster care policies?” on a scale ranging from *agree* (1) to *disagree* (7). A mean of their overall attitude was calculated ($\alpha = 0.97$).

Thoughts. As the thought-listing instructions used in Study 1 were rather long (three paragraphs), and studies have reported using shorter versions (e.g., Barden & Petty, 2008), we opted to abridge the instructions as follows:

We are now interested in what you were thinking about while reading the editorial. You might have had ideas favorable to, opposed to, or not even related to the recommendation in the editorial. Any case is fine; simply list what it was that you were thinking while reading the editorial.

Participants were additionally told to write only one idea or thought per box and we provided only five boxes. In the current study, we reduced the minimum time limit to 3 minutes, but allowed participants to continue longer than this if they wished to do so. All thoughts irrelevant to the message were removed (4.2%) and the remaining thoughts were coded as favorable, unfavorable, or neutral, by two independent raters unaware of the experimental condition ($\kappa = 0.73$). Any disagreements were discussed until a uniform decision was reached.

Argument quality check. Participants were presented the three arguments and had to rate on a 7-point scale how convincing they thought each argument was (ranging from *unconvincing* to *convincing*). Additionally they rated the overall quality of the arguments used to support the policy recommendation, on a 7-point scale ranging from *good* to *bad*. We calculated an overall mean of how convincing participants thought the arguments were ($\alpha = 0.85$).

Amount of processing. To assess the actual amount of processing, we used the total message relevant thoughts listed by participants and argument recall. Instead of assessing perceived amount of processing as in the previous study, we adapted the questions used by

Briñol, McCaslin, and Petty (2012) to capture the perceived amount of effort invested into processing the persuasive message. We asked participants to indicate on a scale ranging from *not at all* (1) to *very* (7), how much energy they spent thinking about the proposed change, how deeply they thought about the proposed change, and how focused they were while doing this task. A mean of the overall perceived amount of effort was calculated ($\alpha = 0.81$).

Results

Achievement wish. Participants had moderate expectations of achieving their professional or academic wish ($M = 5.07$, $SD = 1.51$), high incentive values ($M = 6.18$, $SD = 1.13$), and moderate pre-commitment ($M = 5.46$, $SD = 1.62$). We ran a Kruskal-Wallis H test to check for differences between the fantasy conditions. There were no differences between the three fantasy conditions concerning expectations of success, $H(2) = 4.65$, $p = 0.10$, incentive value, $H(2) = 0.80$, $p = 0.67$, and pre-commitment, $H(2) = 0.63$, $p = 0.73$, indicating successful randomization. Positive correlations existed between all three variables: expectations and incentive value, $r(351) = 0.38$, $p < 0.00$, expectations and pre-commitment, $r(351) = 0.19$, $p < 0.00$, and incentive value and pre-commitment, $r(351) = 0.46$, $p < 0.00$.

Attitudes. We conducted a two-way ANOVA followed by planned simple contrast analyses, to investigate the effect of each fantasy condition on attitude at each level of argument quality. A (reversed) log transformation was performed on the variable before entered into the GLM and planned contrast analyses; however, for ease of interpretation the reported means are from the untransformed data. As in the previous study, the two-way ANOVA revealed a significant main effect of the argument quality, $F(1, 347) = 14.14$, $p < 0.00$, $\eta_p^2 = 0.04$, and no main effect of the fantasy condition, $F(2, 347) = 0.37$, $p = 0.69$, $\eta_p^2 < 0.00$. The interaction was also not significant, $F(2, 347) = 1.40$, $p = 0.25$, $\eta_p^2 = 0.01$. The planned simple contrast analysis on the fantasy conditions found that in the control condition the attitude was significantly

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different between the weak and the strong arguments, $F(1, 347) = 12.39, p < 0.00, \eta_p^2 = 0.03$, $M_{weak} = 4.58, SD_{weak} = 1.85, M_{strong} = 5.65, SD_{strong} = 1.37$. In the indulging condition, the difference did not quite reach significance but shows a strong pattern towards a difference, $F(1, 347) = 3.22, p = 0.07, \eta_p^2 = 0.01, M_{weak} = 5.08, SD_{weak} = 1.68, M_{strong} = 5.64, SD_{strong} = 1.32$. As expected, in the mental contrasting condition the attitude did not significantly differ between the weak and the strong argument condition, $F(1, 347) = 1.48, p = 0.23, \eta_p^2 < 0.00, M_{weak} = 5.05, SD_{weak} = 1.75, M_{strong} = 5.49, SD_{strong} = 1.46$. Figure 2 depicts the reported attitude with regard to argument quality and fantasy condition.

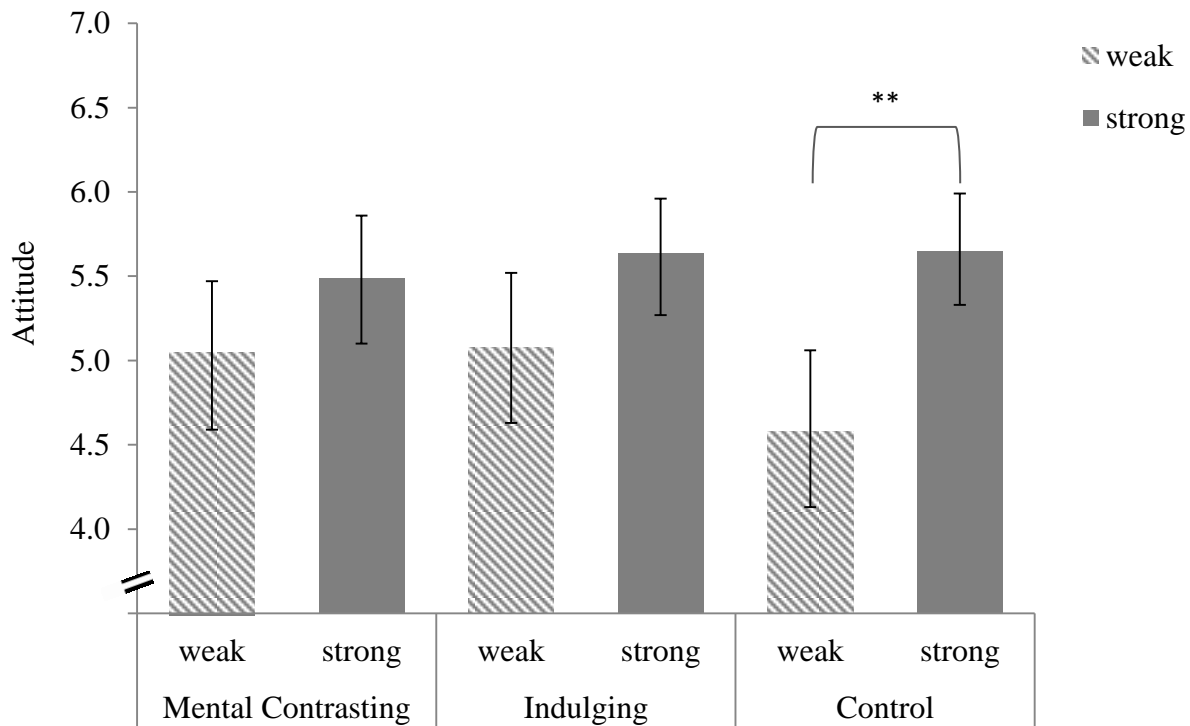


Figure 2. The effect of fantasy condition and argument quality on the reported attitude, including 95% confidence intervals. *Note.* $*p < .05$, $**p < .01$.

Thoughts. We calculated the thought valence with the same formula as used in Study 1. Table 3 depicts the mean thought valence per fantasy and argument quality condition. A positive correlation was found between attitude and thought valence, $r(351) = 0.56, p < 0.00$.

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Table 3

Mean thought valence (SD) in relation to fantasy condition and argument quality.

	Mental contrasting	Indulging	Control
Weak arguments	0.10 (0.42)	0.01 (0.37)	0.03 (0.38)
Strong arguments	0.11 (0.34)	0.09 (0.40)	0.10 (0.40)

We conducted a two-way ANOVA, and found no main effect of the argument quality on the thought valence, $F(1, 345) = 1.78, p = 0.18, \eta_p^2 = 0.01$, nor a main effect of the fantasy condition, $F(2, 345) = 0.54, p = 0.58, \eta_p^2 < 0.00$. The interaction between argument quality and fantasy condition on thought valence was also not significant, $F(2, 345) = 0.31, p = 0.73, \eta_p^2 < 0.00$. Planned simple contrast analysis on the fantasy condition revealed no significant differences between the weak and strong arguments in any of the conditions (control: $F(1, 345) = 1.01, p = 0.32, \eta_p^2 < 0.00$; indulging: $F(1, 345) = 1.38, p = 0.24, \eta_p^2 < 0.00$; mental contrasting: $F(1, 345) = 0.02, p = 0.89, \eta_p^2 < 0.00$).

Argument quality check. A (reversed) square root transformation was performed on the variable before entered into the GLM and planned contrast analyses; however, for ease of interpretation the reported means are from the untransformed data. As expected, a two-way ANOVA revealed a significant main effect of the argument quality on the convincingness of the arguments, $F(1, 347) = 74.39, p < 0.00, \eta_p^2 = 0.18$. Weak arguments were rated as less convincing than strong arguments ($M_{weak} = 3.90, SD_{weak} = 1.72, M_{strong} = 5.35, SD_{strong} = 1.33$). The main effect of the fantasy condition and the interaction between argument quality and fantasy condition was not significant (fantasy: $F(2, 347) = 1.07, p = 0.34, \eta_p^2 = 0.01$; interaction: $F(2, 347) = 0.71, p = 0.49, \eta_p^2 < 0.00$). The planned simple contrast analysis revealed that in all three conditions the strong arguments were rated as more convincing than the weak arguments (mental contrasting: $F(2, 347) = 18.76, p < 0.00, \eta_p^2 = 0.05, M_{weak} = 4.02, SD_{weak} = 1.76, M_{strong} = 5.32, SD_{strong} = 1.18$; indulging: $F(2, 347) = 21.49, p < 0.00, \eta_p^2 = 0.06, M_{weak} = 4.08, SD_{weak} =$

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1.80, $M_{strong} = 5.43$, $SD_{strong} = 1.38$; control: $F(2, 347) = 35.82$, $p < 0.00$, $\eta_p^2 = 0.09$, $M_{weak} = 3.61$, $SD_{weak} = 1.60$, $M_{strong} = 5.30$, $SD_{strong} = 1.44$).

Amount of processing. The total number of thoughts was rather high ($M = 4.78$, $SD = 0.77$), probably indicated a ceiling effect due to the limited five thoughts participants could write. A two-way ANOVA showed no significant main or interaction effects when comparing the number of thoughts (argument quality: $F(1, 347) = 0.13$, $p = 0.88$, $\eta_p^2 < 0.00$; fantasy: $F(2, 347) = 1.23$, $p = 0.27$, $\eta_p^2 < 0.00$; interaction: $F(2, 347) = 0.07$, $p = 0.94$, $\eta_p^2 < 0.00$). The mean overall argument recall was rather low ($M = 1.11$, $SD = 1.12$). Argument recall also did not show any main effects or interaction effects (argument quality: $F(1, 347) < 0.00$, $p = 0.96$, $\eta_p^2 < 0.00$; fantasy: $F(2, 347) = 1.55$, $p = 0.21$, $\eta_p^2 = 0.01$; interaction: $F(2, 347) = 0.07$, $p = 0.93$, $\eta_p^2 < 0.00$). Participants reported a rather high perceived amount of effort ($M = 5.83$, $SD = 1.03$). The perceived amount of effort did not result in any significant main or interaction effects when entered into a two-way ANOVA (argument quality: $F(1, 347) = 0.02$, $p = 0.88$, $\eta_p^2 < 0.00$; fantasy: $F(2, 347) = 1.61$, $p = 0.20$, $\eta_p^2 = 0.01$; interaction: $F(2, 347) = 0.41$, $p = 0.66$, $\eta_p^2 < 0.00$). The total number of thoughts correlated positively with the perceived amount of effort, $r(341) = 0.21$, $p < 0.00$. Argument recall did not significantly correlate with the total number of thoughts, $r(341) = 0.09$, $p = 0.09$, or the perceived amount of processing, $r(351) = 0.09$, $p = 0.08$, but does show a pattern in that direction.

Discussion

The current findings replicate the hypothesized pattern; attitudes in the mental contrasting condition did not significantly differ between the weak and strong arguments. Thus, in the mental contrasting condition, participants formed attitudes that were less dependent on the quality of the presented arguments. In comparison, participants in the control condition, and to a lesser extent those in the indulging condition, reported attitudes that were more in line with the quality of the

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presented arguments. They formed more favorable attitudes in response to strong arguments, and more unfavorable attitudes in response to weak arguments. Unfortunately, the thought valence obtained from the thought-listing measure does not correspond to the pattern obtained for the reported attitudes. The main effect of argument quality was not significant, nor was the differences in thought valence in the indulging condition. Although we cannot be certain, the changed instructions, reduced number of thought boxes, and conditions surrounding the thought-listing measure may have influenced the thoughts participants wrote.

The argument quality check revealed the same results as the previous study; in all fantasy conditions the strong arguments were rated as more convincing than the weak arguments. This again illustrates that those in the mental contrasting condition do not fail to recognize the argument quality, yet do not form attitudes that are strongly dependent on these. As in Study 1, the amount of processing did not show any differences between any of the conditions. Combining these findings, we can again say that the amount of thought does not differ between the groups, but rather the dependence on the argument quality to form attitudes.

As the wish to which participants elaborated was changed from an interpersonal to an achievement related one, we can conclude that the content of the wish is not important for the change in attitudes. Instead engaging in the strategy of mental contrasting, irrespective of the content, results in attitudes that are less dependent on the quality of the presented arguments.

Study 3: Graduation and Comprehensive Exams

Study 1 and Study 2 confirmed that in the mental contrasting condition attitudes were not as strongly guided by the quality of the presented arguments, while those in the indulging and control condition were. The aim of Study 3 was to conceptually replicate these findings, altering the population, experimental setting, fantasy content, and persuasive message. The study was conducted with students at a university in Namibia, who began by naming the year in which they

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wished to graduate. They then mentally contrasted or indulged about this wish, or performed a control task depending on their assigned condition. Thereafter participants were presented with a message persuading them of the implementation of a major comprehensive exam, supported by either weak or strong arguments (see Petty & Cacioppo, 1979; Barden & Petty, 2008). The persuasive topic was chosen as it was deemed appropriate for the target population of students and it is one of the most used persuasive messages in ELM research (e.g., Briñol, et al., 2007; Petty, Briñol, & Tormala, 2002; Cacioppo, Petty, & Morris, 1983). After reading the message, attitudes towards the comprehensive exam were assessed and a thought-listing measure followed. We hypothesized that in the mental contrasting condition, attitudes would be less dependent on the quality of the presented arguments; yet in the indulging and control conditions the weak or strong arguments would drive the attitudes in either an unfavorable or a favorable direction.

Method

Participants and design. We visited pre-scheduled classes at a university in Namibia, each consisting of approximately 20 students. In total 195 students took part in the study; four were excluded as they did not complete the study to the end, and a further eight were excluded as they skipped important questions in the booklet. This left us with a final sample of 183 participants. Participants received 20 N\$ for taking part in the study. Their ages ranged from 17 to 31 ($M = 20.28$ years, $SD = 2.16$), and 84 of the participants were female. All participants were currently registered in an undergraduate degree program, but with a large variety in their field of studies (e.g., agriculture, computer science, and economics). The study followed a 3 (fantasy: mental contrasting, indulging, control) x 2 (argument quality: weak, strong) between-subjects design. Participants in each class were randomly assigned to one of the six conditions. The number of participants in each condition ranged from 29 to 33.

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Materials and procedure. Participants received an informed consent form before commencing with the study and a debriefing at the end of the study. Each participant received a questionnaire and completed it individually within the scheduled class time. Further variables were assessed in the study; see Appendix C for the complete questionnaire.

Graduation wish. As in the previous studies, participants began by reading a short introduction about how people have different wishes pertaining to different areas of their lives. The instructions also stated that we are interested in their academic goals, specifically their wish to graduate. First, we asked participants what year they enrolled at the university and then what year they wish to graduate. Participants were asked to indicate on two separate scales, ranging from *not at all* (1) to *very* (7), how likely and how important it is to them to graduate in the above stated year (i.e., expectations of success and incentive value).

Fantasy induction. In both the mental contrasting and indulging conditions participants were asked, “What would be the best thing, the best outcome of you graduating in the above stated year? How would fulfilling your wish make you feel?” As in the previous studies, they first had to write their best outcome in 3-6 words, and then describe their thoughts and images to the imagined scenario of graduating in the specified year. Participants in the indulging condition named and elaborated the second best outcome, while those in the mental contrasting condition identified an obstacle in the current reality. Again, this was followed by instructions to fully elaborate this obstacle in their mind, and write their thoughts and images down. For example, one participant in the mental contrasting condition wrote, “proud and extremely excited” as her best outcome, and “little confidence in myself” as her main obstacle. Participants in the control condition named and described the packaging of their favorite and second favorite drink (e.g., volume, material, and color). We included this neutral filler task to keep the average time for completing the questionnaire similar across the conditions.

Persuasive message. Participants received an introduction text to the persuasive message, which stated that the university was undergoing an academic re-evaluation by a (fictitious) committee. The committee recommended that as of next year, seniors should pass a comprehensive exam prior to graduation. This exam would test what the students had learned in their majors. Participants read that the committee would like to assess their reactions to the policy before implementing it. They were asked to read the summary section of the report outlining the major reasons for the implementation. Depending on their condition, participants then received the persuasive message with either eight weak or eight strong arguments. Table 4 lists the eight weak and strong arguments read by participants in the summary report. The introduction text, as well as the arguments presented in the summary report were re-created from studies described by Petty and Cacioppo (1979; see also Barden & Petty, 2008) and adapted to the local university.

Table 4

The eight weak and strong arguments presented to participants in the persuasive message.

Weak arguments

- (1) A recent look into the standards and practices of national and international universities makes us believe that adopting the comprehensive exams would allow the [name of institution] to be at the forefront of a national trend.
- (2) In a recent discussion with Master students, many spoke up about the perceived inequalities. They complained that since they have to take exams (very similar to the proposed comprehensive exam), undergraduates should take them also.
- (3) Parents of students have replied to a recent questionnaire, and stated that they support the proposed comprehensive exams.
- (4) In an interview, an anonymous lecturer told us that the exams would help cut costs by eliminating the necessity for other tests that varied with instructor.
- (5) Although we recognize that these exams may increase fear and anxiety in students, we believe this may be beneficial as many students perform better under stress and this could promote studying.
- (6) We have reason to believe that job prospects for students who take this exam might be improved.

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- (7) It is well known that the tradition of taking exams dates back to the ancient Greeks. However, more unknown is that they also considered exams assessing their entire knowledge gained as more indicative. Therefore it makes sense to introduce a comprehensive exam, which is very similar in concept.
 - (8) The exams would allow students to compare their performance with that of students at other faculties and maybe even universities.
-

Strong arguments

- (1) A recent investigation into the standards and practices of national and international universities has revealed that numerous prestigious universities have comprehensive exams to maintain academic excellence.
 - (2) The institution of comprehensive exams at these universities led to a reversal in the declining scores on standardized achievement tests.
 - (3) A recent study investigating the acceptance preferences of graduate and professional schools has shown that many times a preference is given to undergraduates who have passed comprehensive exams.
 - (4) After reviewing the statistics, we found that the average starting salaries are higher for graduates of universities with the exams.
 - (5) The increased starting salaries may in part be explained by the fact that universities with the exams attract larger and more well-known corporations to recruit students for jobs.
 - (6) Universities that have already implemented the exams have found that the quality of teaching has improved.
 - (7) A recent survey, targeting alumni from the [name of institution], concluded that alumni would be glad to increase their financial support (e.g., for improving student services), but wanted some assurance of high educational standards, such as the comprehensive exams, before they would give generously.
 - (8) Recent contact with a member of the National Accrediting Board of Higher Education, has assured us that instituting the exam would lead to an increase in the national ranking of the [name of institution].
-

Attitudes. Attitudes toward the implementation was assessed by asking participants to indicate on a 7-point scale whether they thought the comprehensive exams are *good-bad*, *negative-positive*, *wise-foolish*, *unfavorable-favorable*, and *beneficial-harmful*. They also indicated on a 7-point scale, ranging from *not at all* to *very*, to what extent they agree with the proposal requiring seniors to take the comprehensive exam before graduating (Petty, et al., 1993). A mean of the items was calculated, representing the overall attitude ($\alpha = 0.91$).

Thoughts. Subsequently we asked all participants to write down the five main thoughts they were thinking while reading the message (similar to the instructions used in Study 2). The

thoughts were coded in two steps as favorable, unfavorable, or neutral, by independent raters unaware of the experimental condition ($\kappa = 0.70$; $\kappa = 0.83$). Any disagreements were discussed until a uniform decision was reached.

Results

Graduation wish. The majority of students had enrolled in the year 2015 (82.5 %) and wished to graduate in the year 2018 (45.9%). Overall the participants had rather high expectations of achieving their wish ($M = 6.07$, $SD = 1.25$) and high incentive values ($M = 6.84$, $SD = 0.62$). We ran a Kruskal-Wallis H test to check for differences between the fantasy conditions. There were no differences between expectations of success, $H(2) = 2.181$, $p = 0.34$, and incentive value, $H(2) = 1.78$, $p = 0.41$, indicating successful randomization. There was a significant positive correlation between expectations of success and incentive value, $r(179) = 0.34$, $p < 0.00$.

Attitudes. We conducted a two-way ANOVA followed by planned simple contrast analyses, to investigate the effect of each fantasy condition on attitude at each level of argument quality. We found a marginally significant main effect of the argument quality on the attitudes, $F(1, 177) = 4.03$, $p = 0.05$, $\eta_p^2 = 0.02$. The mean attitude was slightly lower when presented with weak arguments ($M = 5.49$, $SD = 1.48$) compared to strong arguments ($M = 5.89$, $SD = 1.22$). The main effect of the fantasy condition and the interaction were not significant, $F(2, 177) = 1.25$, $p = 0.29$, $\eta_p^2 = 0.01$, and $F(2, 177) = 1.59$, $p = 0.21$, $\eta_p^2 = 0.02$, respectively. Thereafter, we ran the planned simple contrast analysis on the fantasy condition. As expected we found that the attitude in the mental contrasting condition did not significantly differ between the weak and the strong argument conditions ($F(1, 177) = 0.02$, $p = 0.89$, $\eta_p^2 < 0.00$, $M_{weak} = 5.84$, $SD_{weak} = 1.14$, $M_{strong} = 5.89$, $SD_{strong} = 1.08$). Conversely, attitude in the indulging condition was significantly different between the weak and the strong arguments ($F(1, 177) = 6.49$, $p = 0.01$, $\eta_p^2 = 0.04$, $M_{weak} = 5.03$,

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$SD_{weak} = 1.69$, $M_{strong} = 5.93$, $SD_{strong} = 1.21$). In the control condition we could not find the expected pattern, as attitude did not significantly differ between the weak and strong argument conditions, $F(1, 177) = 0.59$, $p = 0.44$, $\eta_p^2 < 0.00$, $M_{weak} = 5.59$, $SD_{weak} = 1.47$, $M_{strong} = 5.84$, $SD_{strong} = 1.37$. Figure 3 depicts the reported attitude with regard to argument quality and fantasy condition.

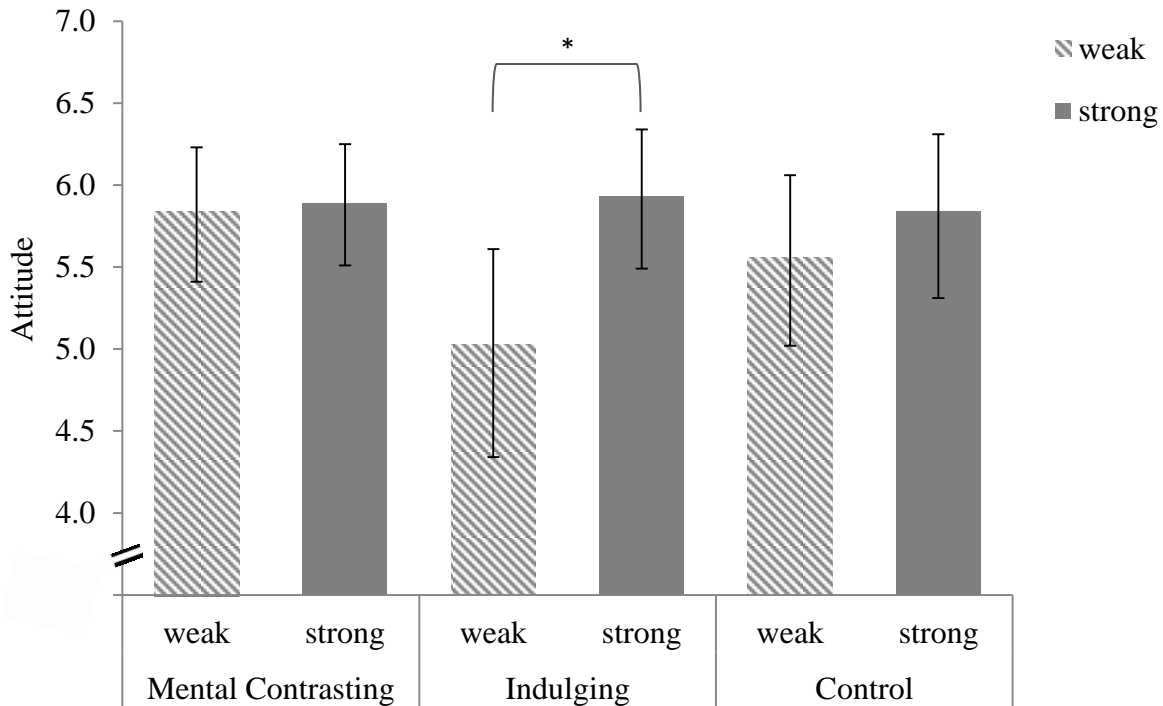


Figure 3. The effect of fantasy condition and argument quality on the reported attitude, including 95% confidence intervals. Note. $*p < .05$, $**p < .01$.

Thoughts. As in the previous studies we calculated the thought valence by subtracting the number of unfavorable thoughts from the number of favorable thoughts, and dividing the difference by the total number of relevant thoughts. This resulted in scores ranging from -1 (very unfavorable) to +1 (very favorable). Table 5 depicts the mean thought valence per fantasy and argument quality condition. A positive correlation was found between attitude and thought valence, $r(180) = 0.61$, $p < 0.00$.

Table 5

Mean thought valence (SD) in relation to fantasy condition and argument quality.

	Mental contrasting	Indulging	Control
Weak arguments	0.34 (0.64)	-0.02 (0.76)	0.44 (0.52)
Strong arguments	0.50 (0.50)	0.35 (0.57)	0.46 (0.54)

A (reversed) log transformation was performed on the variable before it was entered into the GLM; however, for ease of interpretation the reported means are from the untransformed data. We conducted a two-way ANOVA and found no significant main effect of argument quality on the thought valence, $F(1, 177) = 3.24, p = 0.07, \eta_p^2 = 0.02$; although a tendency towards this effect can be seen. Surprisingly, the main effect of the fantasy condition was significant, $F(2, 177) = 3.43, p = 0.04, \eta_p^2 = 0.04$. Post-hoc analysis show that the difference lay mainly between the indulging and the control condition ($p = 0.06$) and the indulging and mental contrasting condition ($p = 0.08$). The interaction between argument quality and fantasy condition on thought valence was not significant, $F(2, 177) = 0.86, p = 0.43, \eta_p^2 = 0.01$. With regard to the planned simple contrast analysis on the fantasy condition, we found a marginally significant difference in the indulging condition, $F(1, 177) = 3.94, p = 0.05, \eta_p^2 = 0.02$. However, no significant difference was observed in the control condition, $F(1, 177) = 0.03, p = 0.85, \eta_p^2 < 0.00$, nor in the mental contrasting condition, $F(1, 177) = 0.83, p = 0.36, \eta_p^2 = 0.01$.

Discussion

Participants who mentally contrasted reported attitudes that did not significantly differ between the weak and strong argument condition. In comparison, this pattern could not be observed for participants who indulged about their future graduation; these reported significantly more favorable attitudes when presented with strong arguments, than when presented with weak arguments. Attitudes in the control condition emulated those of the mental contrasting condition; no significant difference was found between the weak and strong argument condition with regard

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to attitude. Still the above presented results corroborate our hypothesis and the findings of the previous two studies: that mental contrasting leads to attitudes that are not as strongly determined by the quality of the presented arguments. The thought valence obtained from the thought-listing measure mirrored these results. Participants in the mental contrasting condition did not show a difference in thought favorability between weak and strong arguments. However, in the indulging condition a near significant result does support the notion that the favorability of thoughts was more dependent on the quality of the arguments.

The current study does have marked differences in the material and procedure, compared to the first two studies. Firstly, we did not let participants freely choose their wish within a specified domain, but rather guided them with the goal of their graduation. Furthermore, the wish and the persuasive message are thematically not unrelated as they both fall under the academic realm. In addition, the persuasive message was also formatted differently, with no underlying commonalities and the presentation of eight long arguments. Yet despite these differences, along with the change of population and experimental setting, the expected results were found in the mental contrasting and indulging conditions.

An additional variation to the procedure was that participants in the control condition received a filler task after naming their wish (to account for the time spent by other participants indulging or mentally contrasting about the wish). However, it is not clear if or why completing the filler task may have influenced the attitudes generated in response to the persuasive message. Numerous other factors such as the message topic, experimental context, or cultural differences may have had an influence on the results of the control condition. A limitation of the current study is that we did not conduct a pilot study of the persuasive material beforehand. This would have allowed us to decipher if the results found in the current control condition actually represent the pattern that would normally be found or if it was in some way influenced by the current study

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design. Future research should proceed with caution and pilot the material on the target audience to ensure they are appropriately tailored.

Petty and Cacioppo (1979; see also Briñol, et al., 2007) describe the implementation of a comprehensive exam as counter-attitudinal, i.e., that most university students would be against the implementation. Yet this seemed not to be the case in the current study. The overall attitude towards the implementation was rather high ($M = 5.69$, $SD = 1.36$); indicating that the main consensus for the implementation was rather favorable. This is surprising considering the severe implications brought forth in the thought-listing measure (e.g., “Most of this students need to graduate early to support their families and this exams might prevent them from graduating at all” and “The exam before graduation will cost an extra moneys, this is not good with students with financial problems/who cannot afford”). Still, a high number of thoughts were favorable (56.4%) and highlighted the importance of good tertiary education (e.g., “It will force students to take their studies more serious”).

Although just speculative, the operationalization used by Petty and Cacioppo (1979) to form weak and strong arguments (i.e., citing statistics and studies versus quotations and opinions) may have been culturally inappropriate for the current sample. For example, one student wrote, “It is beneficial because, the parent have found it interest and use full”. Hence, what is considered a mere opinion or quote in some cultures, may have a higher value in other cultures. Indeed some research has shown cultural differences between European countries in the persuasiveness of evidence types and quality (Hornikx & Hoeken, 2007; Hornikx, 2011; Hornikx & Haar, 2013). However, studies related to African cultures on argument quality and persuasion are generally scarce. This points to a dire need for research to establish how concepts, methods, and findings derived and tested in western (and eastern) cultures translate, differ, or generalize to other cultures.

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Moreover, previous research and theorizing speaks for a cultural difference in goal pursuit (desirability and feasibility), as well as the type of fantasies preferred by different cultures (Oettingen, Sevincer, & Gollwitzer, 2008; Oettingen, 1997b). In the current study, experimentally induced mental contrasting and indulging for the pre-defined wish of graduation worked well and brought about the expected results. Nevertheless, cultural indicators are apparent in the content of their elaborations. For example, as the best outcome participants wrote statements such as, “Best feeling, making my parents proud”, “Become someone important in our community”, and “I will rely be thankful and very happy because it means helping my parent.” Future studies could investigate cultural differences in the fantasy content, as well as the spontaneous use of strategies, to further cross-cultural research on mental contrasting.

General Discussion

The research question under investigation was whether engaging in mental contrasting before receiving a persuasive message effects attitude change. With three empirical studies we showed that participants who had previously engaged in mental contrasting and then received a persuasive message, reported attitudes that are less dependent on the quality of the presented arguments. This pattern was not observed for participants who had indulged in their wish prior to receiving the persuasive message (Study 1 and Study 3), nor for participants in the control condition who had not engaged in any wish elaborations (Study 1 and Study 2). Participants in these groups overwhelmingly reported attitudes that are conform to the quality of the presented arguments, i.e., more favorable attitudes with strong arguments and less favorable attitudes with weak arguments. These results were found irrespective of the content of the wish that participants initially elaborated (i.e., interpersonal, achievement, and graduation). Engaging in the self-regulation strategy of mental contrasting activates a multitude of goal facilitating cognitive

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procedures, which the current studies show not only affect the goal at hand, but also subsequent persuasion attempts.

A thought-listing measure was used to assess the favorability of participant's thoughts to the implementations proposed in the persuasive messages. Although the favorability of thoughts corresponded with the reported attitudes for the most part, the results were not as clear across the conditions and studies as we had hoped. However, the studies do reveal a pattern for participants who engaged in mental contrasting; these listed thoughts whose favorability was less dependent on the quality of the arguments. The listed thoughts were also very insightful, with regard to the thought processes occurring as participants read the persuasive message. Future research could approach these thoughts from a qualitative perspective or use the responses to guide further experimental studies.

In Study 1 and Study 2, we included an argument quality check to investigate whether participants evaluated the presented arguments correspondingly with their assigned quality. In both studies, we found participants rated the strong arguments as more convincing than the weak arguments, irrespective of fantasy condition. As the participants in all conditions were able to distinguish between weak and strong arguments indicates that a high amount of thought, as characterized by the ELM, was given to the persuasive message. Thus in all conditions, participants evaluate the quality of the arguments according to their intended strength. Yet in the mental contrasting condition, the recognition of argument quality does not lead to a conforming attitude, as transpires in the other conditions. Measures assessing amount of processing seem to corroborate these findings.

Implications for Mental Contrasting

The current research has both theoretical and practical implications that contribute and build upon previous work on mental contrasting.

Transfer effects of mental contrasting. The current research adds to the mental contrasting transfer literature, by showing that mental contrasting has a transfer effect on subsequent attitude change after receiving a persuasive message. Although delving into a new domain, the current research corresponds with the earlier findings. Specifically with the study by Pak et al. (2008, as cited in Oettingen & A. Kappes, 2009), which showed a transfer effect of mental contrasting on a second task that relied on reasoning abilities (i.e., the Raven's Matrices). Reduced dependency on argument quality and an increasing ability to reason seems to illustrate a similar underlying pattern of the effects of mental contrasting.

Although the current research cannot answer what transfer mechanism resulted in the attitudes reported after engaging in mental contrasting, as this was not explicitly measured, a few speculations are warranted. The idea that mental contrasting was learned and subsequently reapplied is not plausible as the task of reading the persuasive message was not formulated as a goal. A transfer in effort or energization is not completely dismissible but rather unlikely considering the finding that the amount of processing did not differ between the conditions. Closely considering the operationalization of the amount of processing, with items such as the amount of energy and attention devoted to the persuasive message, a transfer of effort or energy should have made itself noticeable. We thus reason that procedural or mind-set priming is the most likely explanation of the current findings.

Higgins (1989) describes procedural priming as an effect that occurs due to procedural learning of a recently or frequently used processing procedure, which leads to an increased likelihood of using the same procedure on subsequent tasks. Furthermore, procedural priming has been demonstrated to be free of semantic content (Gollwitzer & Heckhausen, 1987, as cited by Förster, Liberman, & Friedman, 2009). Mind-set priming refers to the priming of very general procedures; it involves participants actively using a certain way of thinking that then increases

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the likelihood of using a similar procedure in a subsequent task (Gollwitzer, 1990; Gollwitzer, Heckhausen, & Steller, 1990; Bargh & Chartrand, 2000; Förster, et al., 2009). Persuasion studies have shown that different mind-sets have the potential to influence attitudes (e.g., Henderson, de Liver, & Gollwitzer, 2008; Chen, Shechter, & Chaiken, 1996; Wyer & Xu, 2010). Considering the current findings, specifically those from Study 1 and Study 2 whose design imitates an unrelated-task paradigm often used in mind-set studies, it is very plausible that procedural or mind-set priming could have driven the effect.

Decreasing influence. The current findings compliment recent research by Riess and Oettingen (2016) that has investigated the use of mental contrasting with implementation intentions to reduce conformity. In their studies, participants were tasked to complete a set of Raven's Matrices that were presented with (bogus) information about the answers chosen by the majority (inducing a conformity setting). Participants who had previously engaged in mental contrasting with implementation intentions, namely about completing the task independently and not conforming to others behavior, ignored the bogus information and choose the right answer. The current findings seem to compliment this effect; in a very simplistic interpretation, mental contrasting (with implementation intentions) seems to reduce influences, whether they are in the form of message-based arguments or the depiction of others opinions.

Interpretation of information. The studies by A. Kappes, Oettingen, and Pak (2012) on negative feedback were the first to show that mental contrasting alters the way goal-relevant information is processed. The current research demonstrates that not only goal-relevant information but also goal-irrelevant information can be interpreted in a different way. Although the focus of the current research was on persuasion and attitude change, it has broader theoretical and practical implications for different fields. Engaging in mental contrasting could prove to be beneficial in situations in which reasoning and decision-making is required, as provided

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information may be viewed with a different perspective and interpretation. In the field of law, mental contrasting could be applied to help jurors form attitudes that are not as strongly guided by the salience of weak or strong arguments and interpret such information in a different way. Lastly, mass media almost continuously rears its head in the form of television broadcasts, newspaper articles, the internet and mobile phones, to name but a few. This is an area in which mental contrasting could have one of its most practical implications. Using the strategy could shield from the numerous weak and strong arguments, that are continuously being released through mass media with the aim of changing attitudes or behaviors. Accordingly, the current research opens up a spectrum of new theoretical and practical implications of mental contrasting that can be pursued in future research.

Implications for Persuasion and Attitude Change

The current research also has important implications for the field of persuasion and attitude change.

Interpretations beyond argument quality. Persuasion research, especially studies based on the ELM, heavily rely on the use of argument quality as a methodological tool. The underlying assumption proposed by the ELM is that under a high amount of thought, the majority will form attitudes that conform to the quality of the presented arguments. However, to date very little research has explored situations in which a high amount of thought can result in attitudes that are less dependent on argument quality. We investigated one of these instances, namely prior mental contrasting, which has shown that participants can look beyond the immediate salience of the argument quality. We suggest that participants that mentally contrasted do not directly react to the argument but use it as a reference point for further thoughts, most likely looking at implications, feasibility, or possible obstacles. These findings have implications for future

research designing and interpreting studies which use argument quality as a variable for investigation.

Operationalization of argument quality. Although the ELM operationalizes argument quality empirically, it is possible that factors other than argument strength or logical plausibility drive its effects (Johnson, et al., 2005). For example, studies found that in most cases argument quality was more closely related to valence (i.e., is it good or bad) than to cogency (i.e., is it likely or unlikely to be true; Johnson, et al., 2004; Areni & Lutz, 1988). It has thus been suggested that past findings on argument quality should be recast as argument valence effects (Eagly & Chaiken, 1993, as cited by Johnson, et al., 2005). What the current research shows is that although argument quality based on valence can influence the majority, it may be less effective for a smaller subset of people (e.g., those engaging in mental contrasting). The question then arises, what sort of arguments need to be constructed to persuade this subset of the population, if good versus bad arguments are not the right ones. We propose that arguments could be operationalized along different criteria. For example, arguments could be classified as likely versus unlikely to be true, reasonable versus unreasonable, or to persuade participants who previously engaged in mental contrasting arguments may need to take the structure of feasible versus unfeasible.

Limitations and Future Research

The three presented studies revealed the re-occurring phenomenon that engaging in mental contrasting reduces the dependence on the quality of arguments when forming attitudes. However, the research does have some limitations, but also opens up new research possibilities that build on these gaps and findings.

Expectations of success. While describing the four self-regulation strategies identified in the fantasy realization theory, we made the important point that only mental contrasting activates

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the expectations of success. To simplify the dimensions, the current research narrowed the focus to mental contrasting *with high expectations* effects attitude change. In Study 1 and Study 2, we asked participants to name a wish that was challenging, yet feasible. This specific formulation ensures that participants name a wish for which they have high expectations (Oettingen, 2012). In Study 3, we asked participants to indicate what year they wished to graduate. As the year was determined individually and the participants were currently in their first year of studies, high expectations of success were anticipated. Thus in all three studies the average expectations of success for the specified wishes were rather high. This of course brings the limitation that the found results cannot be generalized to engaging in mental contrasting with low expectations of success.

Attitude origins. The current research illustrates that engaging in mental contrasting results in the formation of attitudes that are less dependent on argument quality. However, what the research does not address is what factors contribute to the attitude formation. One speculation would be that mental contrasting directs focus to the feasibility and impeding obstacles of both the presented arguments and the core issues of the persuasive message; they may form independent arguments both for and against the proposed arguments and core issues. Future studies could explore this by having participants generate their own arguments (see Tormala, Clarkson, & Petty, 2006). Alternatively, engaging in mental contrasting could result in participants reverting to their acquired knowledge and experience to help them form an attitude. Future studies could vary the amount of prior knowledge in the persuasive messages to investigate whether differences exist.

Consequences of decreased dependence on argument quality. The ELM proposes that attitudes resulting from the processing of issue-relevant arguments will show greater temporal persistence, resistance, and be a better predictor of behavior (Petty & Cacioppo, 1986). However,

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this theoretical notion and the supporting studies were built on the idea that a high amount of thought leads to attitudes that are strongly dependent on the argument quality. Thus, the question arises how attitudes that are less dependent on the quality of presented arguments behave in terms of persistence, resistance, and behavioral predictions. It is probable that a stronger commitment is formed to an attitude after engaging in mental contrasting. This in turn could increase persistence, resistance, and behavior, although the effect would not be observed in an argument quality dependent way. Future research can explore how the attitudes formed after mental contrasting change over time or in response to counter-attitudinal persuasive messages, as well as their effects on behavior intentions and actual behavior.

Conclusion

Mental contrasting is a self-regulation strategy, in which the envisioned positive future is contrasted to the obstacles in the present reality. The current research set out to investigate whether engaging in this strategy before receiving a persuasive message leads to a distinctive interpretation thereof and corresponding attitudes that are less dependent on argument quality. Three empirical studies showed that the reported attitudes and favorability of thoughts were not significantly different when receiving weak and strong arguments, when previously engaging in mental contrasting. For the most part, indulging or not fantasizing resulted in attitudes and thoughts that were dependent on the quality of the presented arguments. In all fantasy conditions, participants invested a high amount of thought and could distinguish the quality between weak and strong arguments; yet in the mental contrasting condition, this did not translate into the corresponding unfavorable and favorable attitudes and thoughts. This has new implications for the field of mental contrasting, adding to the pre-existing findings of a mental contrasting transfer effect and more importantly showing that engaging in mental contrasting alters the way subsequent information is interpreted. Our findings also have important implications for the field

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of persuasion, as we showed that under certain circumstances attitudes are less dependent on argument quality, even when a high amount of thought was devoted to the message. In

conclusion, engaging in mental contrasting is an effective strategy for reducing the dependence on argument quality when forming an attitude based on a persuasive message.

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[Fantasy Induction]

(Mental Contrasting)

What would be the best thing, the best outcome about fulfilling your wish? How would fulfilling your wish make you feel?

Note your best outcome using 3-6 words:

Think about the best outcome in vivid detail and write about all the thoughts and images that come to your mind. Let your mind wander and allow these events and experiences to play out. Imagine things fully! Don't hesitate to give your thoughts and images free rein. Take as much time as you need.

Please write your thoughts and images down:

(Indulging)

What would be the best thing, the best outcome about fulfilling your wish? How would fulfilling your wish make you feel?

Note your best outcome using 3-6 words:

Think about the best outcome in vivid detail and write about all the thoughts and images that come to your mind. Let your mind wander and allow these events and experiences to play out. Imagine things fully! Don't hesitate to give your thoughts and images free rein. Take as much time as you need.

Please write your thoughts and images down:

(Control)

No task.

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(Mental Contrasting)

Sometimes things don't work out as we would like them to. What holds you back from fulfilling your wish? What is it within you that stands in the way of you fulfilling your wish? What is your main obstacle?

Note your main obstacle using 3-6 words:

Think about the main obstacle in vivid detail and write about all the thoughts and images that come to your mind. Let your mind wander and allow these events and experiences to play out. Imagine things fully! Don't hesitate to give your thoughts and images free rein. Take as much time as you need.

Please write your thoughts and images down:

(Indulging)

What would be the second best thing, the second best outcome about fulfilling your wish? How would fulfilling your wish make you feel?

Note your second best outcome using 3-6 words:

Think about the second best outcome in vivid detail and write about all the thoughts and images that come to your mind. Let your mind wander and allow these events and experiences to play out. Imagine things fully! Don't hesitate to give your thoughts and images free rein. Take as much time as you need.

Please write your thoughts and images down:

(Control)

No task.

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How disappointed would you feel if your wish did not come true?

not at all ☐ ☐ ☐ ☐ ☐ ☐ very
☐

How energized do you feel with respect to realizing your wish?

not at all ☐ ☐ ☐ ☐ ☐ ☐ very
☐

-----page break-----

We now begin with the second part.

Unless otherwise stated, the following material and questions are reconstructed and adapted from Petty, et al. (1993), Wegener, et al. (1995), and Briñol, et al. (2007).

[Introduction to Persuasive Message]

On the following page you will be presented with an editorial about improving foster care programs. We are interested in your opinions toward specific policy changes, regarding the foster care program.

The editorial argues that the typical state foster care program should be changed to emulate Rhode Island's program. It proposes new policies that should be adopted.

-----page break-----

**[Persuasive Message]
(Strong)**

EDITORIALS	
Improving Foster Care Programs	
<p>Foster care programs are systems designed to take care of children who come from broken homes, as well as children whose parents are abusive, neglectful, or are unable to provide for them. Currently foster care programs are not the same across states. A recent proposition, which has been much deliberated, proposes three primary policy changes that would improve the typical state foster care program. These changes would make foster care programs, in all states, more like the Rhode Island foster care program.</p> <p>One of the advocated changes that should be adopted from the Rhode Island foster care program is that children are required to stay with their foster parents until they are 18 years old rather than the customary 16 years. The Rhode Island program believes that it is important for children to have the support of</p>	<p>their family when dealing with life's challenges.</p> <p>Another proposed policy is that foster parents should have multiple children in their families. The presence of siblings aids the social development of foster children; brothers and sisters offer an additional source of love and support for children.</p> <p>The third suggested policy is that foster children are required to maintain good grades and good behavior. This will lead to a boost in their self-confidence.</p> <p>The proposition has been brought to the attention of the National Conference of State Legislatures, and will be discussed in an upcoming session.■</p>

(Weak)

EDITORIALS	
Improving Foster Care Programs	
<p>Foster care programs are systems designed to take care of children who come from broken homes, as well as children whose parents are abusive, neglectful, or are unable to provide for them. Currently foster care programs are not the same across states. A recent proposition, which has been much deliberated, proposes three primary policy changes that would improve the typical state foster care program. These changes would make foster care programs, in all states, more like the Rhode Island foster care program.</p> <p>One of the advocated changes that should be adopted from the Rhode Island foster care program is that children are required to stay with their foster parents until they are 18 years old rather than the customary 16 years. The Rhode Island program believes it is important for</p>	<p>parents to have power and authority over the foster child for as long as possible.</p> <p>Another proposed policy is that foster parents should have multiple children in their families. The presence of siblings would be good for foster children, so they have other children to fight with; brothers and sisters provide an ideal opportunity for this to occur.</p> <p>The third suggested policy is that foster children are required to maintain good grades and good behavior. This will lead to them looking good to school teachers and others.</p> <p>The proposition has been brought to the attention of the National Conference of State Legislatures, and will be discussed in an upcoming session. ■</p>

MENTAL CONTRASTING AND PERSUASION

-----page break-----

[Attitudes]

The adoption of the proposed foster care policies would be...

good

☐☐☐☐☐☐☐☐

bad

☐

negative

☐☐☐☐☐☐☐☐

positive

☐

wise

☐☐☐☐☐☐☐☐

foolish

☐

un-
favourable

☐☐☐☐☐☐☐☐

favourable

☐

beneficial

☐☐☐☐☐☐☐☐

harmful

☐

-----page break-----

To what extent do you agree/disagree with the adoption of the proposed foster care policies?

agree

☐☐☐☐☐☐☐☐

disagree

☐

To what extent are you persuaded by the adoption of the proposed foster care policies?

not at all
persuaded

☐☐☐☐☐☐☐☐

definitely
persuaded

☐

[Attention Check: Self-generated]

How many questions are on this page, excluding this one?

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

-----page break-----

[Thoughts: Cacioppo & Petty, 1981]

We are now interested in what you were thinking about while reading the message. You might have had ideas all favorable to the recommendation, all opposed, all irrelevant to the recommendation, or a mixture of the three. Any case is fine; simply list what it was that you were thinking while reading the message.

The next page contains the form we have prepared for you to use to record your thoughts and ideas. Simply write down the first idea you had in the first box, the second idea in the second box, etc. Please put only one idea or thought in a box. You should try to record only those ideas that you were thinking during the message. Please state your thoughts and ideas as concisely as possible ... a phrase is sufficient. IGNORE SPELLING, GRAMMAR, AND PUNCTUATION.

You will have 5 minutes to write your thoughts. After 5 minutes the survey will automatically skip to the next page. We have deliberately provided more space than we think most people will need to insure that everyone would have plenty of room to write the ideas they had during the message. So don't worry if you don't fill every space. Just write down whatever your thoughts were during the message. Please be completely honest and list all of the thoughts that you had.

-----page break-----

[illegible]

-----page break-----

MENTAL CONTRASTING AND PERSUASION

[Perceived Amount of Processing: Barden & Petty, 2008]

To what extent did you think a lot about the information about the proposed foster care policies?
To what extent did you pay attention to the information about the proposed foster care policies?

a little a lot

☐ ☐ ☐ ☐ ☐ ☐ ☐

-----page break-----

[Attitude Certainty: Barden & Petty, 2008]

How certain are you of your opinion about the proposed foster care policies?
How confident are you of your opinion about the proposed foster care policies?
How sure are you of your opinion about the proposed foster care policies?

not at all very

☐ ☐ ☐ ☐ ☐ ☐ ☐

-----page break-----

[Familiarity and Personal Relevance: Self-generated]

Are you familiar with any foster care programs?
Are you familiar with any foster care policies?

Does a change in foster care policies have **personal** importance to you?
Does a change in foster care policies have significant consequences for your own life?

not at all very

☐ ☐ ☐ ☐ ☐ ☐ ☐

[Issue Involvement: Cacioppo, Petty, & Morris, 1983]

How likely do you think it is that the National Conference of State Legislatures will agree to the proposed changes to the foster care programs?

not at all very

☐ ☐ ☐ ☐ ☐ ☐ ☐

[Attention Check: Self-generated]

How many questions are on this page, excluding this one?

1 2 3 4 5 6 7 8 9

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

-----page break-----

[Recall: Self-generated]

You read about three proposed foster care policies. Try to recall the arguments, or reasons behind these policies, that lend themselves as support for the proposed foster care policies. Please try to recall only what you read.

-----page break-----

[Argument Quality Check]

The message you read contained some arguments to support the adoption of the new foster care policies. Please rate how convincing you find each argument.

(Strong)

1) The Rhode Island program believes that it is important for children to have the support of their family when dealing with life's challenges.

un-convincing convincing

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

2) The presence of siblings aids the social development of foster children; brothers and sisters offer an additional source of love and support for children.

un-convincing convincing

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

3) Foster children are required to maintain good grades and good behavior. This will lead to a boost in their self-confidence.

un-convincing convincing

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

MENTAL CONTRASTING AND PERSUASION

(Weak)

1) The Rhode Island program believes it is important for parents to have power and authority over the foster child for as long as possible.

un-convincing

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

convincing

2) The presence of siblings would be good for foster children, so they have other children to fight with; brothers and sisters provide an ideal opportunity for this to occur.

un-convincing

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

convincing

3) Foster children are required to maintain good grades and good behavior. This will lead to them looking good to school teachers and others.

un-convincing

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

convincing

-----page break-----

[PANAS - Watson, Clark, & Tellegen, 1988]

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

	very slightly or not at all	a little	moderately	quite	extremely
interested	○	○	○	○	○
distressed	○	○	○	○	○
excited	○	○	○	○	○
upset	○	○	○	○	○
strong	○	○	○	○	○
guilty	○	○	○	○	○
scared	○	○	○	○	○
hostile	○	○	○	○	○
enthusiastic	○	○	○	○	○
proud	○	○	○	○	○
irritable	○	○	○	○	○
alert	○	○	○	○	○
ashamed	○	○	○	○	○
inspired	○	○	○	○	○
nervous	○	○	○	○	○
determined	○	○	○	○	○
attentive	○	○	○	○	○
jittery	○	○	○	○	○
active	○	○	○	○	○
afraid	○	○	○	○	○

-----page break-----

[Demographics]

Please answer the following questions.

1) Age: _____ (dropdown)

2) Sex: ☐ Male ☐ Female

3) Mother tongue: ☐ English ☐ Other: _____

4) Country of Birth: ☐ United States of America ☐ Other: _____

5) What level of education have you completed?

- ☐ Have not graduated Highschool
- ☐ Highschool or GED
- ☐ Bachelor degree (or equivalent)
- ☐ Masters degree
- ☐ Doctoral degree
- ☐ Other: _____

6) Employment status:

- ☐ Full-time employed
- ☐ Part-time employed
- ☐ Student
- ☐ Unemployed

7) Do you currently live in the State of Rhode Island?

- ☐ Yes
- ☐ No

8) Have you lived in the State of Rhode Island in the past?

- ☐ Yes
- ☐ No

Appendix B
Study 2 Online Booklet

The following material and questions are adapted from the department template (for a review see Oettingen, 2012).

Every day as we get up in the morning, go about our business, and go to sleep at night, we think about different wishes in our lives. We are interested in the kinds of wishes that people have in different areas or domains of their lives. **[Fantasy Introduction]**

Most people value professional or academic achievement and are often concerned about their professional or academic accomplishments. Which personal wish about your professional or academic achievement is presently most on your mind? Your wish should be challenging for you, but you should be able to resolve it within the next couple of weeks. **[Wish]**

Please write that wish here:

-----page break-----

How likely do you think it is that your wish will come true? **[Expectations of success]**

not at all very
☐ ☐ ☐ ☐ ☐ ☐

How important is it to you that your wish will come true? **[Incentive value]**

not at all very
☐ ☐ ☐ ☐ ☐ ☐

How disappointed would you feel if your wish did not come true? **[Pre-Commitment]**

not at all very
☐ ☐ ☐ ☐ ☐ ☐

-----page break-----

MENTAL CONTRASTING AND PERSUASION

[Fantasy Induction]

(Mental Contrasting)

What would be the best thing, the best outcome about fulfilling your wish? How would fulfilling your wish make you feel?

Note your best outcome using 3-6 words:

Think about the best outcome in vivid detail and write about all the thoughts and images that come to your mind. Let your mind wander and allow these events and experiences to play out. Imagine things fully! Don't hesitate to give your thoughts and images free rein. Take as much time as you need.

Please write your thoughts and images down:

(Indulging)

What would be the best thing, the best outcome about fulfilling your wish? How would fulfilling your wish make you feel?

Note your best outcome using 3-6 words:

Think about the best outcome in vivid detail and write about all the thoughts and images that come to your mind. Let your mind wander and allow these events and experiences to play out. Imagine things fully! Don't hesitate to give your thoughts and images free rein. Take as much time as you need.

Please write your thoughts and images down:

(Control)

No task.

-----page break-----

MENTAL CONTRASTING AND PERSUASION

(Mental Contrasting)

Sometimes things don't work out as we would like them to. What holds you back from fulfilling your wish? What is it within you that stands in the way of you fulfilling your wish? What is your main obstacle?

Note your main obstacle using 3-6 words:

Think about the main obstacle in vivid detail and write about all the thoughts and images that come to your mind. Let your mind wander and allow these events and experiences to play out. Imagine things fully! Don't hesitate to give your thoughts and images free rein. Take as much time as you need.

Please write your thoughts and images down:

(Indulging)

What would be the second best thing, the second best outcome about fulfilling your wish? How would fulfilling your wish make you feel?

Note your second best outcome using 3-6 words:

Think about the second best outcome in vivid detail and write about all the thoughts and images that come to your mind. Let your mind wander and allow these events and experiences to play out. Imagine things fully! Don't hesitate to give your thoughts and images free rein. Take as much time as you need.

Please write your thoughts and images down:

(Control)

No task.

-----page break-----

MENTAL CONTRASTING AND PERSUASION

This marks the end of the first part of the survey. Please continue to the next page to begin the second part.

-----page break-----

Unless otherwise stated, the following material and questions are reconstructed and adapted from Petty, et al. (1993), Wegener, et al. (1995), and Briñol, et al. (2007).

[Introduction to Persuasive Message]

On the following page you will be presented with an editorial about improving foster care programs. We are interested in your opinions toward specific policy changes, regarding the foster care program. The editorial argues that the typical state foster care program should be changed to emulate Rhode Island's program. It proposes new policies that should be adopted.

-----page break-----

[Persuasive Message] (Strong)

EDITORIALS	
Improving Foster Care Programs	
Foster care programs are systems designed to take care of children who come from broken homes, as well as children whose parents are abusive, neglectful, or are unable to provide for them. Currently foster care programs are not the same across states. A recent proposition, which has been much deliberated, proposes three primary policy changes that would improve the typical state foster care program. These changes would make foster care programs, in all states, more like the Rhode Island foster care program.	their family when dealing with life's challenges.
One of the advocated changes that should be adopted from the Rhode Island foster care program is that children are required to stay with their foster parents until they are 18 years old rather than the customary 16 years. The Rhode Island program believes that it is important for children to have the support of	Another proposed policy is that foster parents should have multiple children in their families. The presence of siblings aids the social development of foster children; brothers and sisters offer an additional source of love and support for children.
	The third suggested policy is that foster children are required to maintain good grades and good behavior. This will lead to a boost in their self-confidence.
	The proposition has been brought to the attention of the National Conference of State Legislatures, and will be discussed in an upcoming session.■

(Weak)

EDITORIALS	
Improving Foster Care Programs	
<p>Foster care programs are systems designed to take care of children who come from broken homes, as well as children whose parents are abusive, neglectful, or are unable to provide for them. Currently foster care programs are not the same across states. A recent proposition, which has been much deliberated, proposes three primary policy changes that would improve the typical state foster care program. These changes would make foster care programs, in all states, more like the Rhode Island foster care program.</p> <p>One of the advocated changes that should be adopted from the Rhode Island foster care program is that children are required to stay with their foster parents until they are 18 years old rather than the customary 16 years. The Rhode Island program believes it is important for</p>	<p>parents to have power and authority over the foster child for as long as possible.</p> <p>Another proposed policy is that foster parents should have multiple children in their families. The presence of siblings would be good for foster children, so they have other children to fight with; brothers and sisters provide an ideal opportunity for this to occur.</p> <p>The third suggested policy is that foster children are required to maintain good grades and good behavior. This will lead to them looking good to school teachers and others.</p> <p>The proposition has been brought to the attention of the National Conference of State Legislatures, and will be discussed in an upcoming session. ■</p>

-----page break-----

In this section we want to know your thoughts about the proposed foster care policies.

[Attitudes]

The adoption of the proposed foster care policies would be...

bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	good
positive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	negative
foolish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	wise
favourable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	un-favourable
harmful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	beneficial

MENTAL CONTRASTING AND PERSUASION

To what extent do you agree/disagree with the adoption of the proposed foster care policies?

agree

☐☐☐☐☐☐

disagree

☐

-----page break-----

[Thoughts: Self-generated]

We are now interested in what you were thinking about while reading the editorial. You might have had ideas favorable to, opposed to, or not even related to the recommendation in the editorial. Any case is fine; simply list what it was that you were thinking while reading the editorial. Simply write down the first idea you had in the first box, the second idea in the second box, etc. Please put only one idea or thought in a box.

Only after 3 minutes will the 'next' button appear at the bottom of the screen.

-----page break-----

[Thought Coding]

Below you will see each of the thoughts you have written. For each of your thoughts, please indicate whether you think your thought is favorable, unfavorable, or neutral with regard to the proposed foster care policies.

For thought boxes you left empty or thoughts that do not pertain to the current topic (irrelevant) please choose 'no thought'.

MENTAL CONTRASTING AND PERSUASION

Thought 1: #Text#

☐ positive ☐ negative ☐ neutral ☐ no thought

(Same for the other thoughts)

-----page break-----

[Behavioral Intentions: Self-generated]

1. Would you be willing to sign a petition for the implementation of the proposed policies?
2. Would you be willing to give a small donation to help implement the new policies?
3. Would you be willing to write a short editorial in which you convince others to support the implementation of the policies?
4. Would you be willing to share the proposed policies on social media to increase the support for their implementation?

not at all

☐☐☐☐☐☐

very

☐

-----page break-----

[Perceived Amount of Processing: Briñol, et al., 2012]

1. How much energy did you spend thinking about the proposed change?
2. How deeply did you think about the proposed change?
3. How focused were you, while doing this task?

not at all

☐☐☐☐☐☐

very

☐

[Attention Check: Self-generated]

4. This is not a question, just click on the third circle.

not at all

☐☐☐☐☐☐

very

☐

MENTAL CONTRASTING AND PERSUASION

[Subjective Ambivalence: Luttrell, Petty, & Briñol, 2016]

5. To what extent do you feel conflicted, mixed, and indecision with regard to the proposed policies?

	<i>not at all</i>						<i>very</i>
<i>Conflicted</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Mixed</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Indecision</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

-----page break-----

[Recall Instructions: Self-generated]

You read about three proposed foster care policies. Try to recall only the arguments, or reasons given for these policies, that lend themselves as support for the proposed foster care policies. Please try to recall only what you read.

-----page break-----

[Argument Quality Check]

The editorial you read contained some arguments to support the adoption of the new foster care policies. Please rate how convincing you find each argument.

(Strong)

1: The Rhode Island program believes that it is important for children to have the support of their family when dealing with life's challenges.

un-convincing ☐ ☐ ☐ ☐ ☐ convincing

MENTAL CONTRASTING AND PERSUASION

2: The presence of siblings aids the social development of foster children; brothers and sisters offer an additional source of love and support for children.

un-convincing ○ ○ ○ ○ ○ convincing

3: Foster children are required to maintain good grades and good behavior. This will lead to a boost in their self-confidence.

un-convincing ○ ○ ○ ○ ○ convincing

Please rate the overall quality of the arguments used to support the policy recommendation.

good ☐ ☐ ☐ ☐ ☐ ☐ bad

(Weak)

1: The Rhode Island program believes it is important for parents to have power and authority over the foster child for as long as possible.

un-convincing ○ ○ ○ ○ ○ convincing

2: The presence of siblings would be good for foster children, so they have other children to fight with; brothers and sisters provide an ideal opportunity for this to occur.

un-convincing ○ ○ ○ ○ ○ convincing

3: Foster children are required to maintain good grades and good behavior. This will lead to them looking good to school teachers and others.

un-convincing ○ ○ ○ ○ ○ convincing

MENTAL CONTRASTING AND PERSUASION

[Argument Quality Check: Self-generated]

Please rate the overall quality of the arguments used to support the policy recommendation.

good

☐☐☐☐☐☐

bad

☐

-----page break-----

[Demographics]

Please answer the following questions.

1. Age: _____

2. Sex:

☐ Male

☐ Female

3. Mother tongue:

☐ English ☐ Other: _____

4. What level of education have you completed?

☐ Have not graduated Highschool

☐ Highschool or GED

☐ Bachelor degree (or equivalent)

☐ Masters degree

☐ Doctoral degree

☐ Other: _____

5. Employment status:

☐ Full-time employed

☐ Part-time employed

☐ Student

☐ Unemployed

☐ Other: _____

6. Country of birth: _____ (dropdown)

Appendix C
Study 3 Booklet

The following material and questions are adapted from the department template (for a review see Oettingen, 2012).

Every day as we get up in the morning, go about our business, and go to sleep at night, we think about different wishes in our lives. We are interested in the kinds of wishes that people have in different areas or domains of their lives. We are interested in your academic goals, specifically your wish to graduate. **[Fantasy Introduction]**

1. What year did you first enrol at the Polytechnic of Namibia? **[Enrolment]**

2. What year do you wish to graduate? **[Wish]**

3. How likely do you think it is that you will graduate in the above stated year?
[Expectations of success]

not at all very
☐ ☐ ☐ ☐ ☐ ☐

4. How important is it to you that you graduate in the above stated year?
[Incentive value]

not at all very
☐ ☐ ☐ ☐ ☐ ☐

-----page break-----

MENTAL CONTRASTING AND PERSUASION

[Fantasy Induction]

(Mental Contrasting)

5. What would be the best thing, the best outcome of you graduating in the above stated year? How would fulfilling your wish make you feel?

(a) Note your best outcome using only 3-6 words:

(b) Now take a moment and imagine this best outcome. Imagine things fully. Please write your thoughts and images down:

(Indulging)

5. What would be the best thing, the best outcome of you graduating in the above stated year? How would fulfilling your wish make you feel?

(a) Note your best outcome using only 3-6 words:

(b) Now take a moment and imagine this best outcome. Imagine things fully. Please write your thoughts and images down:

(Control)

5. Imagine you have been contacted by a Namibian drink factory that is collecting information on how to package their new drinks. Please think of your favourite drink.

(a) Note the name of this drink:

(b) Now take a moment and think of the packaging of this drink (e.g. volume, material, colour, design). Please write the description of the packaging here:

-----page break-----

MENTAL CONTRASTING AND PERSUASION

(Mental Contrasting)

6. Sometimes things don't work out as we would like them to. What holds you back from graduating in the above stated year? What is it within you that stands in the way of you fulfilling your wish? What is your main obstacle?

- (a) Note your main obstacle using only 3-6 words:

- (b) Now take a moment and imagine your main obstacle. Imagine things fully. Please write your thoughts and images down:

(Indulging)

6. What would be the second best thing, the second best outcome of you graduating in the above stated year? How would fulfilling your wish make you feel?

- (a) Note your second best outcome using only 3-6 words:

- (b) Now take a moment and imagine this best outcome. Imagine things fully. Please write your thoughts and images down:

(Control: self-generated)

6. Please think of your second favourite drink.

- (a) Note the name of this drink:

- (b) Now take a moment and think of the packaging of this drink (e.g. volume, material, colour, design). Please write the description of the packaging here:

7. How disappointed would you feel if you did not graduate in the above stated year?

[Commitment]

not at all

☐☐☐☐☐☐

very

☐

-----page break-----

MENTAL CONTRASTING AND PERSUASION

Unless stated otherwise, the following material and questions are reconstructed and adapted from Petty and Cacioppo (1979).

[Introduction to Persuasive Message]

Please read the following two pages and then answer the questions below.

The Polytechnic of Namibia is currently undergoing an academic re-evaluation by the University Committee on Academic Policy. The committee consists of members from each faculty and their function is to advise the Rector on changes in academic policy that should be instituted. The committee is working on academic changes to be initiated the next year.

One of the changes being recommended for next year is the imposition of a requirement that seniors take a comprehensive exam in their major area prior to graduation. The exam would be a test of what the student had learned after completing the major, and a certain score would be required if the student was to graduate.

Before implementing this policy, the University Committee on Academic Policy wants to assess students' reactions to the proposed policy. The material you will read is the summary section of the report written by the chairperson in which he or she outlines the major reasons why the committee feels the exam policy should begin next year. Please take your time to read the summary so that you do not need to re-read it when answering questions later on.

-----page break-----

MENTAL CONTRASTING AND PERSUASION

[Persuasive Message]

(Weak)

In summary, here are the major reasons why comprehensive exams for seniors should be instituted.

- A recent look into the standards and practices of national and international universities makes us believe that adopting the comprehensive exams would allow the Polytechnic of Namibia to be at the forefront of a national trend.
- In a recent discussion with Master students, many spoke up about the perceived inequalities. They complained that since they have to take exams (very similar to the proposed comprehensive exam), undergraduates should take them also.
- Parents of students have replied to a recent questionnaire, and stated that they support the proposed comprehensive exams.
- In an interview, an anonymous lecturer told us that the exams would help cut costs by eliminating the necessity for other tests that varied with instructor.
- Although we recognize that these exams may increase fear and anxiety in students, we believe this may be beneficial as many students perform better under stress and this could promote studying.
- We have reason to believe that job prospects for students who take this exam might be improved.
- It is well known that the tradition of taking exams dates back to the ancient Greeks. However, more unknown is that they also considered exams assessing their entire knowledge gained as more indicative. Therefore it makes sense to introduce a comprehensive exam, which is very similar in concept.
- The exams would allow students to compare their performance with that of students at other faculties and maybe even universities.

MENTAL CONTRASTING AND PERSUASION

(Strong)

In summary, here are the major reasons why comprehensive exams for seniors should be instituted.

- A recent investigation into the standards and practices of national and international universities has revealed that numerous prestigious universities have comprehensive exams to maintain academic excellence.
- The institution of comprehensive exams at these universities led to a reversal in the declining scores on standardized achievement tests.
- A recent study investigating the acceptance preferences of graduate and professional schools has shown that many times a preference is given to undergraduates who have passed comprehensive exams.
- After reviewing the statistics, we found that the average starting salaries are higher for graduates of universities with the exams.
- The increased starting salaries may in part be explained by the fact that universities with the exams attract larger and more well-known corporations to recruit students for jobs.
- Universities that have already implemented the exams have found that the quality of teaching has improved.
- A recent survey, targeting alumni from the Polytechnic of Namibia, concluded that alumni would be glad to increase their financial support (e.g., for improving student services), but wanted some assurance of high educational standards, such as the comprehensive exams, before they would give generously.
- Recent contact with a member of the National Accrediting Board of Higher Education, has assured us that instituting the exam would lead to an increase in the national ranking of the Polytechnic of Namibia.

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The University Committee on Academic Policy would like to know your opinions on the implementation of a comprehensive exam.

[Attitudes]

8. Comprehensive Exams for seniors are ...

good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	bad
negative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	positive
wise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	foolish
un- favourable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	favourable
beneficial	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	harmful

9. To what extent do you agree with the proposal requiring seniors to take comprehensive exams before graduating?

not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	very
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MENTAL CONTRASTING AND PERSUASION

[Thoughts: Self-generated]

10. We are now interested in what you were thinking about while reading the summary. You might have had ideas all favourable to the recommendation, all opposed, all irrelevant to the recommendation, or a mixture of the three. Any case is fine; simply list the five main thoughts you had; write down the first idea you had in the first box, the second idea in the second box, etc. Please put only one idea or thought in a box.

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MENTAL CONTRASTING AND PERSUASION

[Perceived Amount of Processing: Barden & Petty, 2008]

11. To what extent did you think a lot about the information about Senior Comprehensive Exams?

A little

☐☐☐☐☐☐

A lot

☐

12. To what extent did you pay attention to the information about Senior Comprehensive Exams?

A little

☐☐☐☐☐☐

A lot

☐

[Attitude Certainty: Barden & Petty, 2008]

13. How certain are you of your opinion about Senior Comprehensive Exams?

not at all

☐☐☐☐☐☐

very

☐

14. How confident are you of your opinion about Senior Comprehensive Exams?

not at all

☐☐☐☐☐☐

very

☐

15. How sure are you of your opinion about Senior Comprehensive Exams?

not at all

☐☐☐☐☐☐

very

☐

[Argument Quality: Self-generated]

16. Please rate the quality of the arguments used to support the policy recommendation:

Poor/
unconvincing
arguments

☐☐☐☐☐☐

Good/
convincing
arguments

☐

[Issue
Involvement]

[Issue Involvement: Cacioppo, Petty, & Morris, 1983]

17. How likely is it that the Polytechnic of Namibia will implement the policy recommendation about which you read?

not at all

☐☐☐☐☐☐

very

☐

MENTAL CONTRASTING AND PERSUASION

[Personal Relevance: Self-generated]

18. How personally relevant or important did you find the policy recommendation?

not at all ○ ○ ○ ○ ○ ○ very

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[Demographics]

Before concluding the questionnaire, we would like to gather some demographic information about you.

19. Age: _____

20. Gender: ☐ Male ☐ Female

21. Mother tongue: _____

23. What are your plans after you graduate? (you may tick more than one)

- ☐ Get employment
- ☐ Study further
- ☐ Become an entrepreneur
- ☐ Other: _____

24. What is your field of study?

25. What final grade did you get for your basic science course (or equivalent) last semester?

26. What final grade did you get for your computer literacy course (or equivalent) last semester?
