

# Taking Responsibility for Others and Use of Mental Contrasting

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## Abstract

Mentally contrasting a desired future with present reality fosters selective goal pursuit: People pursue feasible desired futures and let go from unfeasible ones. We investigated whether people are more inclined to spontaneously use mental contrasting when they feel responsibility. Studies 1 and 2 provided correlational evidence: Employees who felt responsible for completing an important team project (Study 1) and MTurk users who felt and actively took social responsibility (Study 2) were more inclined to use mental contrasting. Studies 3 and 4 added experimental evidence: Students who were instructed to imagine responsibility for giving an excellent class presentation in a group or alone (Study 3) and participants who elaborated on an idiosyncratic wish that involved responsibility for others or themselves tended to use mental contrasting (Study 4). Apparently, people who feel or take responsibility for others, the society, or themselves are more likely to use mental contrasting as a self-regulation tool.

## Keywords

self-regulation, mental contrasting, future thinking, responsibility, content-analyses

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A student is preparing an important class presentation together with a group of fellow students. She feels responsible for making the collaborative presentation a success. Imagining the desired future of giving an outstanding group presentation—feeling like a good team player—and then identifying the crucial inner obstacle that may keep her from preparing for the presentation—shyness to speak up—should make her recognize that she needs to take action (e.g., speak up and make her contribution). Thus, envisioning both the desired future and the critical obstacle (i.e. mental contrasting) will lead the student to act toward making her contribution to the team project.

Mental contrasting helps people to act on important personal projects. At the same time, people tend to spontaneously use mental contrasting when the demand to act is high rather than low. Here, we asked whether people are more inclined to spontaneously use mental contrasting when they feel responsible to act on important projects. We investigated feelings of responsibility not only regarding personal projects (fulfilling an idiosyncratic wish), but also regarding projects that benefit others (giving an excellent team presentation) or the society at large (acting in a socially responsible way). In doing so, we used correlational and experimental designs. Concerning the student above, we posit that the more responsible she feels for making the team presentation a success, the more likely she is to use mental contrasting.

## Mental Contrasting

When people employ mental contrasting, they first name an important wish (“starting a charity project”). They then identify and envision the best outcome of their desired future (“feelings of doing meaningful work”) and identify and envision their present reality that may stand in the way of realizing their wish (“not knowing how to start a charity project”). Envisioning first the desired future and immediately thereafter the present reality strengthens implicit associative links between future and reality (Kappes & Oettingen, 2014) and between the reality and means to surmount the reality (“checking the Internet”; Kappes et al., 2012). It also leads people to realize they need to overcome the reality to fulfill their wish (Kappes et al., 2013). These effects occur if people expect they can overcome the obstacle (i.e., have high expectations of success). If they expect they cannot overcome the obstacle (i.e., have low expectations), mental contrasting weakens associative links between future and

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reality and between reality and means to overcome the reality, and it keeps people from seeing their reality as an obstacle to their desired future. In sum, mental contrasting produces selective goal pursuit; people will vigorously pursue their wish when expectations are high but will let go when expectations are low.

Imagining the desired future only (indulging) or the present reality only (dwelling) does not change future–reality and reality–means links and does not make people recognize that the reality is an obstacle to their desired future. Similarly, envisioning the reality before the future (reverse contrasting) does not change respective associative links because the reality is not perceived in the context of the desired future and thus cannot be recognized as an obstacle to the desired future (Kappes & Oettingen, 2014). To sum up, mental contrasting more than indulging, dwelling, or reverse contrasting produces changes in implicit associative links which in turn mediate the effect of mental contrasting on selective (expectations-based) goal pursuit.

### *Inducing Mental Contrasting*

Most studies on mental contrasting experimentally induced mental contrasting to investigate its effects on selective goal pursuit. The participants in these studies first wrote down a personally important wish from a specific domain. Those in the mental contrasting condition then named and elaborated the best aspect they associate with having realized their desired future. Directly after this, they named and elaborated an aspect of their current reality that prevents them from realizing their desired future. Typical control conditions were an indulging condition (participants named and elaborated the best aspect of their desired future followed by their second best future aspect), a dwelling condition (participants named and elaborated their most crucial reality aspect followed by their second most crucial reality aspect), a reverse contrasting condition (participants named and elaborated their most crucial reality aspect followed by their best future aspect), or an irrelevant content condition (participants named and elaborated irrelevant content).

The dependent variable was goal pursuit measured by cognitive (planning), affective (anticipated emotions in case of failure), motivational (commitment), physiological (effort), and behavioral indicators (performance). The indicators were self-reported or observed and were measured directly after the mental procedure or weeks later. In these studies, mentally contrasting participants more than those in the control conditions evinced selective goal pursuit (Oettingen, 2000; Oettingen et al., 2009; Sevincer et al., 2014; summaries by Oettingen & Sevincer, 2018; Sevincer & Oettingen, 2015). Also, in intervention studies, mental contrasting helped participants in their everyday life to successfully act on attaining their desired futures such as becoming more physically active (Sheeran et al., 2013), or excelling at school (Gollwitzer et al., 2011).

### *Measuring Mental Contrasting*

There also is a measure to assess the spontaneous use of mental contrasting (Sevincer & Oettingen, 2013). Mirroring the procedure to induce mental contrasting, participants are first asked to name an important personal wish. Then they freely write about their wish, and their texts are content analyzed to identify participants' mode of thought. Studies supported the predictive (Sevincer & Oettingen, 2013), concurrent (Sevincer et al., 2015), convergent, and discriminant validity (Sevincer et al., 2017) of the coding system. In sum, the method is a reliable and valid measure of spontaneous mental contrasting.

The measure has been employed to examine persons' states and traits that are associated with whether they use mental contrasting. Because mental contrasting is cognitively demanding, making participants mentally fatigued (Muraven & Baumeister, 2000) led to a lower number of participants who used mental contrasting (Sevincer et al., 2015). Also, because mental contrasting is an effective strategy to set priorities and manage one's everyday life, people who are well self-regulated used mental contrasting (Sevincer et al., 2017).

Studies also investigated in which situations people spontaneously use mental contrasting. Participants who experienced a high (vs. low) demand to act toward attaining their desired future, for example, when facing a planned or necessary action that was immediate (vs. not immediate) used mental contrasting (Sevincer et al., 2018). We go beyond previous research by investigating whether people are more likely to use mental contrasting when they feel responsible for others, the society, or themselves. This might be the case because people who feel responsible should be more compelled to act and therefore more inclined to self-regulate by mental contrasting.

### **Responsibility**

The concept of responsibility has received attention in the fields of philosophy, sociology, political science, economics, law, and psychology. Generally, responsibility is understood as a triangular relationship between a subject (e.g., a person, group, or institution), an object (e.g., oneself, another person, or the society at large), and an authority (e.g., one's own ideals, one's employer, or the law). In this relationship, the acting subject is responsible for an object performing an action or attaining an outcome toward the authority. For example, a middle-level manager is responsible for his subordinates completing a work project toward his boss, a person on a diet is responsible for eating low-fat food toward his conscience, or a religious person feels responsible for the welfare of society toward god. The to-be-performed action or to-be-attained outcome varies from area to area (politics, economics, law) and may range from specific tasks (giving a presentation) to broad outcomes (contributing to the welfare of society). In

psychology, responsibility is further differentiated as an individual difference or person attribute (some persons feel more responsible for people in need than others; Berkowitz & Daniels, 1964; Bierhoff, 2000) versus a situational state (in some situations people feel more responsible to help than in other situations; Darley & Latané, 1968; Heider, 1958).

To encompass these different aspects of responsibility, we operationalized responsibility in different ways to examine its relationship to (and effect on) the use of mental contrasting. Studies 1 and 2 examined responsibility as a person attribute. Study 1 focused on participants' responsibility for their work team completing a specific project, and Study 2 focused on participants' responsibility for contributing to the welfare of society at large. Studies 3 and 4 examined responsibility elicited in the situation. Study 3 focused on students' responsibility for giving a class presentation alone or together with their fellow students, and Study 4 focused on participants' idiosyncratic wishes that involve responsibility for themselves or others.

We suspected that people who experience responsibility (vs. no responsibility) would be more inclined to engage in mental contrasting, because mental contrasting is a self-regulation strategy that helps people to act, and people who experience responsibility feel compelled to take action to fulfill their responsibility.

## Responsibility and Self-Regulation

Support for the idea that people who feel responsibility are more inclined to take action and self-regulate their behavior comes from several lines of research. First, in research on diffusion of responsibility, bystanders who witnessed an accident and felt personal responsibility because they were the only person around were more likely to help than bystanders who had diffused responsibility because there were other people present (Darley & Latané, 1968; meta-analysis by Fischer et al., 2011). Another study used Milgram's (1974) obedience paradigm. Participants who were assigned sole responsibility for the decision to give shocks to an alleged fellow participant gave milder shocks than participants who were assigned to a three-member team (Bandura et al., 1975).

Second, according to the norm-activation model (Schwartz, 1977), personal responsibility is a determinant of people's readiness to act, particularly when it comes to pro-social actions. Personal responsibility and awareness of the consequences of one's action (or inaction) impact people's personal norms, which in turn guide their actions. In research on environmental-friendly behavior, people who self-reported stronger feelings of responsibility reported stronger intentions to act environmental-friendly and reported acting in a more environmentally friendly way (e.g., buying energy-saving light bulbs; Kaiser et al., 1999; Liere & Dunlap, 1978).

Finally, responsibility not only encompasses responsibility for others or the society, but also for oneself. When

participants' felt responsibility for the welfare of their future self was activated, they engaged in more effective future-oriented self-regulation—they increased their retirement savings (Bryan & Hershfield, 2013).

## The Present Research

To examine the link between responsibility and spontaneous self-regulation by mental contrasting, in Studies 1 and 2 we used a correlational design. Study 1 investigated whether employees who reported feeling more rather than less responsible for completing an important team project would use mental contrasting when thinking about their project. In Study 2, we measured whether participants who feel and actively take more responsibility for the welfare of the society would use mental contrasting when thinking about an important wish directed at benefiting their society. Studies 3 and 4 used an experimental design to establish a causal effect of responsibility on mental contrasting. Study 3 manipulated responsibility for self, others, or self and others versus no responsibility using a scenario method, and Study 4 manipulated responsibility by asking participants to elaborate on an idiosyncratic personal wish that either involved responsibility for self, others, self and others, or no responsibility. In all three studies, we measured spontaneous mental contrasting using the method by Sevincer and Oettingen (2013).

In our first study, we recruited employees of a large German company who worked in small teams. To measure how much the employees felt responsible for their team completing an important project, we asked participants to complete the *Experienced Responsibility for the Work* subscale of the *Job Diagnostic Survey* (Hackman & Oldham, 1975). The scale measures the degree to which employees feel personally accountable and responsible for the results of their work. This was our primary measure of responsibility in Study 1.

In addition, we reasoned that people feel more responsibility the fewer other people are in a group to share the responsibility. For example, visitors in a restaurant gave higher tips when they were with a small rather than large group (Freeman et al., 1975), and people were more likely to help a stranger the fewer other people were around (Darley & Latané, 1968). Moreover, research on social loafing suggests that people contribute more to a desired group outcome the smaller their group is (Karau & Williams, 1993). For example, in a rope-pulling contest, the smaller a group was the more effort each group member contributed to the contest (Kravitz & Martin, 1986). Therefore, as a proxy of the responsibility that the employees felt in their team, we asked them to report the number of co-workers in their team. The fewer co-workers were in a team, the more personal responsibility each team member may feel for the project. The reported number of team members was our secondary measure of responsibility in Study 1.

We then assessed whether the employees mentally contrasted when thinking about their project. We suspected that it would be the employees who felt more responsibility for the success of their team who used mental contrasting rather than those who felt less responsibility.

## Study I: Responsibility for Completing a Team Project at Work

### Method

**Participants and design.** Ninety employees (48 male, 41 female, one unidentified,  $M_{\text{age}} = 38.21$  years,  $SD = 11.32$ ) of a large international company in Germany completed the study online. Because there were no prior studies on the relationship between responsibility and spontaneous mental contrasting, we recruited as many employees as we could. Employees were recruited via word of mouth advertising at their company. The study used a cross-sectional, correlational design.

### Procedure

**Project, expectations, and incentive.** Employees first named the team project they were currently working on. They named, for example, “process optimization.” In line with prior research (Sevincer & Oettingen, 2013), to examine whether our hypothesized results remain robust over and above differences in employees’ expectations of successfully completing their project and their incentive of completing the project, we measured expectations and incentive. We used analogous items as in our previous studies on mental contrasting, here focused on completing a work project. To measure expectations, we asked “How likely is it that you will successfully complete the project?” and to measure incentive, “How important is it to you to successfully complete the project?” (7-point scales; 1 = *not at all*, 7 = *very*).

### Responsibility for the team project

**Felt responsibility.** To assess employees’ felt responsibility for bringing the project to successful completion, we used the German version of the *Experienced Responsibility for the Work* subscale of the *Job Diagnostic Survey* (Schmidt & Kleinbeck, 1999). The *Job Diagnostic Survey* is widely used in practice and research. It has high internal and construct validity. The *Experienced Responsibility for the Work* subscale consists of six items (e.g., “I feel a very high degree of personal responsibility for the work I do on this job”) using 7-point Likert-type scales (1 = *disagree strongly*, 4 = *neutral*, 7 = *agree strongly*). Following Hackman and Oldham (1975), we averaged the six items into an index of felt responsibility ( $\alpha = .56$ ).

**Given responsibility.** As a secondary measure for the responsibility employees had for completing their team project we asked participants for the number of team members.

**Assessment of self-regulatory thought.** To measure mental contrasting, we followed the procedure by Sevincer and Oettingen (2013). We asked employees to freely think about their project (verbatim instructions are in the supplemental material). Employees typed their thoughts into a designated field. We first segmented the texts into statements. A statement was defined as at least one subject–predicate sequence or more. Of the 90 employees, four (1%) listed only keywords (“difficult”). For those employees, we considered each keyword as one statement.

Two trained raters then independently coded each statement into one of three categories: (a) desired future, (b) present reality, or (c) other. The raters were blind to participants’ responses on the other questionnaire items. Statements coded as about the desired future included descriptions of desired future events and consequences of realizing the desired future, such as feelings, material and nonmaterial gains, and improvements in the current situation. Statements coded as about the present reality included descriptions of the present reality and obstacles to realizing the desired future. Statements coded into the category “other” included ambiguous statements, statements about past events, the self in general, and the experimental situation. The detailed coding scheme and an example of one employee’s elaboration are described in the supplemental material. Interrater agreement was 87% ( $\alpha = .82$ ). Statements on which the raters disagreed were coded into the category “other.”

An employee was classified as mentally contrasting if the employee generated at least one statement about the desired future and at least one statement about the present reality, mentioning the future first; if the employee mentioned the reality first, they were classified as reverse contrasting. An employee was classified as indulging if they generated at least one statement about the future but none about the reality and as dwelling if they generated at least one statement about the reality but none about the future. If an employee generated only statements categorized as “other,” we did not include the employee in any of the above categories.

We recorded the number of generated statements as an indicator of how thoroughly employees elaborated on their project. This measure allowed us to ensure that the hypothesized relationship between responsibility and mental contrasting cannot be explained by a relationship between responsibility and more thorough elaboration. To conclude, employees completed a demographic questionnaire. In this and all following studies we included descriptions of all conditions. The complete materials for this and all following studies are presented in the supplemental material.

## Results

### Descriptive analyses

**Expectations, incentive, and number of statements.** Table 1 depicts the descriptive statistics for expectations, incentive, and the number of generated statements. In all studies, expectations

**Table 1.** Studies 1 to 4: Means and Standard Deviations (in Parenthesis) for Expectations and Incentive, Correlation Coefficients for the Correlation Between Expectations and Incentive, and Mean Number of Generated Statements.

Study	Expectations	Incentive	<i>r</i> expectations–incentive	Generated statements
1	6.01 (0.99)	6.56 (0.71)	.35*	3.80 (2.82)
2	4.83 (1.69)	5.82 (1.26)	.46*	4.35 (3.37)
3	5.39 (1.23)	5.78 (1.17)	.55*	8.22 (5.62)
4	4.64 (1.86)	6.14 (1.17)	.45*	7.36 (5.34)

\* $p < .05$ .

**Table 2.** Studies 1 to 4: Number of Participants Engaging in the Different Modes of Thought in Each Study.

Study	<i>n</i>	Self-regulatory thought				
		Mental contrasting	Indulging	Dwelling	Reverse contrasting	Other
1	90	18 (20)	10 (11)	38 (42)	11 (12)	13 (14)
2	195	47 (24)	98 (50)	23 (12)	20 (10)	7 (4)
3	240	71 (30)	57 (24)	48 (20)	52 (22)	12 (5)
4	260	57 (22)	102 (39)	52 (20)	33 (13)	16 (6)

Note. Percentages of the modes of thought within each study in parenthesis.

and incentive were above the midpoint of the 7-point scales, indicating that participants had relatively high expectations and incentive. Moreover, in all studies the number of statements differed between the four modes of thought (see analyses in the supplemental material). Following Sevincer et al. (2017, 2015), to verify that the hypothesized pattern is not due to variations in expectations, incentive, or the number of statements we controlled for these variables in all four studies.

**Responsibility for the team project.** Employees mean felt responsibility for their team project was above the midpoint of the 7-point scale ( $M = 4.70$ ;  $SD = 0.78$ ), indicating that employees felt high responsibility for their project. Employees reported on average working with 6.82 ( $SD = 8.60$ ) colleagues on their project. The number of coworkers working on a project did not correlate with employees' felt responsibility,  $r = -.06$ ,  $p = .58$ .

**Self-regulatory thought.** Table 2 depicts the number of participants using each mode of thought in all four studies. In line with Sevincer and Oettingen (2013), employees who generated only statements categorized as "other" were excluded from the analyses. We dummy-coded the categorical self-regulatory thought variable into mental contrasting (0) versus not mental contrasting (1; indulging, dwelling, and reverse contrasting combined).

#### Relationship between responsibility and mental contrasting

**Felt responsibility and mental contrasting.** Felt responsibility correlated positively with the dummy-coded mental contrasting

variable,  $r = .30$ ,  $p = .009$  (point-biserial correlation), indicating that, as predicted, employees who felt more responsibility for their team project used mental contrasting rather than those who felt less responsibility. Of the one fourth of employees who felt the most responsibility 35% used mental contrasting, compared with 17% of the one fourth who felt the least responsibility. To control for expectations, incentive, and the number of statements, we conducted hierarchical binary logistic regression analyses with the felt responsibility index as predictor in the first step and the dummy-coded mental contrasting variable as the dependent variable. Felt responsibility predicted mental contrasting. When we added expectations, incentive, and the number of statements as predictors in the second step, felt responsibility continued to predict mental contrasting. Thus, the pattern was robust when controlling for the added variables. See Table 3 for a summary of the regression analyses.<sup>1</sup>

In each study, we also tested whether responsibility predicted each of the other modes of thought (indulging, dwelling, and reverse contrasting). We describe these analyses in the supplemental material and discuss the results in the "General Discussion" section.

**Given responsibility and mental contrasting.** The number of team members did not significantly correlate with the dummy-coded mental contrasting variable,  $r = -.15$ ,  $p = .21$  (point-biserial correlation). The relationship was in the same direction as the relationship between felt responsibility and mental contrasting, however. The relationship remained non-significant when we controlled for expectations, incentive, and the number of statements ( $p = .20$ ).

**Table 3.** Studies 1 and 2: Summary of Hierarchical Binary Logistic Regression Analyses for Responsibility, Expectations, Incentive, and Number of Statements Predicting the Dummy-Coded Mental Contrasting Variable (Mental Contrasting Versus Not).

Predictors	$\Delta R^2$	<i>B</i>	<i>SE B</i>	<i>P</i>	OR <sup>a</sup>	95% CI <sup>b</sup>
Study 1: Felt responsibility						
Step 1	.14*					
Responsibility for the Work Scale		1.06	.42	.01	2.87	[1.26, 6.56]
Step 2	.05					
Responsibility for the Work Scale		0.99	.42	.02	2.68	[1.18, 6.11]
Expectations		0.58	.40	.14	1.79	[0.82, 3.91]
Incentive		-0.32	.46	.50	0.73	[0.29, 1.81]
Number of statements		0.04	.10	.72	1.04	[0.86, 1.25]
Study 2: Felt responsibility						
Step 1	.05*					
Empathic Concern Scale		0.63	.25	.01	1.88	[1.15, 3.08]
Step 2	.04					
Empathic Concern Scale		0.62	.28	.02	1.86	[1.08, 3.20]
Expectations		-0.12	.11	.30	0.89	[0.71, 1.11]
Incentive		0.08	.19	.66	1.08	[0.76, 1.56]
Number of statements		0.09	.05	.07	1.10	[0.99, 1.21]
Study 2: Self-reported taken responsibility						
Step 1	.03*					
Altruistic Personality Scale		0.51	.25	.04	1.66	[1.02, 2.70]
Step 2	.04					
Altruistic Personality Scale		0.47	.26	.08	1.60	[0.95, 2.67]
Expectations		-0.12	.11	.28	0.89	[0.71, 1.10]
Incentive		0.15	.18	.39	1.16	[0.83, 1.64]
Number of statements		0.09	.05	.09	1.10	[0.99, 1.22]
Study 2: Observed taken responsibility						
Step 1	.05*					
Donated bonus (vs. not)		0.89	.35	.01	2.43	[1.22, 4.81]
Step 2	.04					
Donated bonus (vs. not)		0.76	.36	.03	2.19	[1.08, 3.43]
Expectations		-0.12	.11	.27	0.88	[0.71, 1.11]
Incentive		0.19	.17	.26	1.21	[0.87, 1.69]
Number of statements		0.08	.05	.12	1.09	[0.98, 1.20]

Note. \* $p < .05$ . OR = odds ratio; CI = confidence interval.

<sup>a</sup>ORs represent the likelihood that participants use mental contrasting with an increase in the predictor variable. For example, the OR of 2.87 for the relationship between felt responsibility and the use of mental contrasting in Study 1 signifies that with a one-unit increase in participants' felt responsibility scores, the likelihood that participants use mental contrasting is 2.87 times as high. <sup>b</sup>The 95% CI is the confidence interval for the odds ratio. For example, the confidence interval for the relationship between felt responsibility and the use of mental contrasting signifies that with a 95% probability the true value (the population statistic) of the OR of 2.87 lies between 1.26 and 6.56.

## Discussion

The employees who felt more responsibility for their team project were more inclined to use mental contrasting than those who felt less responsibility. The responsibility we inferred by the number of co-workers in the team was not significantly related to mental contrasting. The relationship was in the same direction, however.

The effect size for the relationship between felt responsibility and mental contrasting was medium (point-biserial correlation  $r = .27$ , transformed into  $d = 0.56$ ; Cohen 1988, Lenhard & Lenhard, 2016). The relationship was robust when we controlled for employees' expectations of successfully completing

the project, the incentive of completing the project, and the number of statements they generated. The fact that the relationship between felt responsibility and mental contrasting remained robust when controlling for the number of statements speaks against the alternative explanation that the more responsibility employees feel, the more they think and thus write about their wish and that way responsibility was related to the use of mental contrasting.

Study 1 focused on responsibility for small teams in work contexts. In Study 2, we looked at social responsibility for the welfare of the society at large. Social responsibility has been conceptualized as an inclination to help other people to reach their goals (Berkowitz & Daniels, 1964), as a readiness to

actively engage in social life and fulfill one's social duties (Bierhoff, 2000), and as a moral obligation to act for the benefit of society at large (McWilliams & Siegel, 2001). Therefore, as an indicator of participants' felt social responsibility, we measured their self-reported empathy toward others. We also measured self-reported and actual behavior: Participants self-reported their past prosocial behavior and, in addition, we gave them the option to donate a part of their compensation for participating in the study to a charity organization. Whether or not participants donated was our indicator of observed social responsibility.

Mental contrasting was measured by content analyzing participants' thoughts about an important personal wish directed at contributing to the welfare of society. We hypothesized that it would be the participants who felt or took more social responsibility who used mental contrasting rather than those who felt or took less responsibility.

## Study 2: Social Responsibility for Contributing to the Welfare of Society

### Method

**Participants and design.** Participants were 195 Americans who completed the questionnaire online. They were recruited via Mechanical Turk for a study on social responsibility (87 male, 105 female, three unidentified,  $M_{\text{age}} = 34.5$  years,  $SD = 10.1$ ). To determine sample size, we performed power calculations using the observed effect size from Study 1. Given a critical alpha of .05 and an effect size of  $r = .27$ , to detect such an effect with high power (95%), we would need about 175 participants (Faul et al., 2007). Participants were informed that they will receive US\$0.50 for taking part and would receive a bonus of additional US\$0.50 if they fully completed the study. At the end of the study, we then told participants they could donate all or a part of their bonus to a charity organization. We recorded whether or not participants actively took responsibility by donating to the charity. The study used a cross-sectional, correlational design.

### Procedure

**Wish, expectations, and incentive.** Participants named an important personal wish directed at taking on more social responsibility. They read: "For many people, responsibility toward our fellow human beings has high importance in our society today. Please name a personal wish that is important to you and that is about taking on more social responsibility." Participants named for example "join UNICEF." They then indicated their expectations of successfully fulfilling their wish ("How likely is it that you will achieve your wish?") and their incentive ("How important is it to you to achieve your wish?") using 7-point scales (1 = *not at all*, 7 = *very*).

#### Self-reported social responsibility measures

**Felt responsibility.** Participants completed the Empathic Concern subscale of the Interpersonal Reactivity Index

(IRI; Davis, 1983). The Empathic Concern subscale is a reliable and valid way of measuring feelings of sympathy and compassion for others. It consists of seven items (e.g., "I often have tender, concerned feelings for people less fortunate than me") using a 5-point scale (1 = *does not describe me very well*, 5 = *describes me very well*). Following Davis (1983), we combined the items into one index of felt responsibility ( $\alpha = .88$ ).

**Self-reported taken responsibility.** Participants completed the Altruistic Personality Scale (APS; Rushton et al., 1981). The APS has high predictive and convergent validity and is frequently used in research to measure past prosocial actions (Rushton et al., 1981). It contains 20 items describing prosocial acts the participants performed to help strangers (e.g., "I have donated goods or clothes to a charity"). Participants answered on a 5-point scale (1 = *never*, 5 = *very often*). Following Rushton et al. (1981), we combined the items into one index of self-reported taken responsibility ( $\alpha = .90$ ).

**Assessment of self-regulatory thought.** As in Study 1, we measured self-regulatory thought by asking participants to freely write about the named wish and content analyzed their texts using the procedure and coding scheme described in Study 1 (see also Sevincer & Oettingen, 2013). Of the 195 participants, two (1%) listed only keywords. For the coding of the statements, agreement between the two raters was 83% ( $\kappa = .72$ ). To conclude, participants completed a demographic questionnaire.<sup>2</sup>

**Observed taken responsibility.** We observed participants' donation behavior. At the end of the questionnaire, we informed participants that they now receive a bonus of US\$0.50 for having completed the questionnaire in addition to their pay of US\$0.50. We also told them that they have the option to donate all or a part of their bonus to a charity organization. Participants indicated whether they wanted to keep the bonus or donate all or a part of it. We used whether or not participants donated as our observed indicator of their taken social responsibility. On the final screen, participants were informed that they would receive the entire bonus (all participants were paid US\$1.00) and given the link to the website of a child aid organization in case they wanted to donate the money.

## Results

### Descriptive analyses

**Expectations, incentive, and generated statements.** Table 1 depicts the descriptive statistics for expectations, incentive, and the number of generated statements.

**Social responsibility measures.** Participants' mean self-reported empathy toward others was at 4.03 ( $SD = .78$ ) of the 5-point scale, and their mean self-reported prosocial

behavior was at 2.78 ( $SD = .71$ ) of the 5-point scale. The two self-reported social responsibility measures correlated positively,  $r = .30$ ,  $p < .001$ . Of the 195 participants, 62 (32%) chose to donate all or a part of their bonus to a charity organization. The 62 participants, who donated, donated on average US\$0.36 of their US\$0.50 bonus. Whether participants donated correlated with their self-reported empathy toward others and their self-reported prosocial behavior (point-biserial correlations:  $r = .19$  and  $r = .25$ , respectively,  $ps < .01$ ).

**Self-regulatory thought.** Table 2 depicts the number of participants using each mode of thought. As in Study 1, participants who generated only statements categorized as other were excluded and self-regulatory thought was dummy-coded into mental contrasting (0) versus not (1).

**Relationship between social responsibility and mental contrasting.** We conducted analogous analyses as in Study 1.

**Felt responsibility and mental contrasting.** Self-reported empathy correlated positively with the dummy-coded mental contrasting variable,  $r = .19$ ,  $p = .010$  (point-biserial correlation). Of the one fourth of participants with the highest scores, 33% used mental contrasting, compared with 13% of the one fourth with the lowest scores. Hierarchical binary logistic regression analyses with empathy as predictor in the first step and the dummy-coded mental contrasting variable as the dependent variable indicated that empathy predicted mental contrasting. When we added expectations, incentive, and the number of statements as predictors in the second step, empathy continued to predict mental contrasting. See Table 3 for a summary of the regression analyses.

**Self-reported taken responsibility and mental contrasting.** Self-reported prosocial behavior correlated positively with the dummy-coded mental contrasting variable,  $r = .15$ ,  $p = .04$  (point-biserial correlation). Of the one fourth of participants with the highest scores, 28% used mental contrasting, compared with 8% of the one fourth with the lowest scores. Hierarchical binary logistic regression analyses indicated that self-reported prosocial behavior tended to predict mental contrasting. The relationship remained (marginally) significant when we added expectations, incentive, and the number of statements as predictors (Table 3).

**Observed taken responsibility and mental contrasting.** Because whether or not participants donated was a dichotomous variable, we first performed chi-square analyses. The proportion of mental contrasting participants differed between those who donated all or a part of their bonus and those who did not,  $\chi^2(1) = 6.62$ ,  $p = .010$ ,  $\phi = .19$ . Of the 62 participants who donated, 35% (22 participants) used mental contrasting whereas of the 126 participants who did not donate 20% (25 participants) used mental contrasting.

Hierarchical binary logistic regression analyses indicated that the observed donation behavior predicted mental contrasting and the relationship remained significant when we added expectations, incentive, and the number of statements as predictors (Table 3).

## Discussion

Participants who felt or actively took more social responsibility (as assessed by their self-reported empathy, their self-reported prosocial behavior, and their observed donation behavior, respectively) tended to use mental contrasting when writing about an important personal wish directed at contributing to the welfare of society rather than those who felt or took less responsibility. The effect size was medium (point-biserial correlations  $r = .19$  and  $.15$  and  $\phi = .19$ , transformed into  $d$ s = 0.38, 0.30, and 0.38). The relationship was robust when we controlled for expectations of success, incentive, and the number of statements.

Studies 1 and 2 provide correlational evidence that responsibility for others and for the society is related to mental contrasting. Study 3 aimed to test whether responsibility causally leads people to use mental contrasting. In the academic domain, we examined university students' responsibility for contributing to a good grade in a team project. To manipulate responsibility we used a scenario method. We asked the students to imagine they were preparing a class presentation together with two fellow students. At German universities, it is common that students give class presentations in a group, and the presentations are often graded, either individually or in a group. We used four experimental conditions. We told the students to imagine that their performance in the presentation would influence either their own grade only, their fellows' grade only, their own and their fellows' grade, or neither their own nor their fellows' grade.

Because feeling responsibility rather than feeling no responsibility should make people feel compelled to act, regardless of whether the responsibility is directed to others or oneself (Bryan & Hershfield, 2013; Fischer et al., 2011), we hypothesized that of the students who imagined responsibility (for self only, for others only, or for both self and others) more students would use mental contrasting than of those who imagined no responsibility.

## Study 3: Responsibility for a Successful Team Presentation

### Method

**Participants and design.** Participants were 240 students from Universities in Germany (54 male, 186 female,  $M_{\text{age}} = 24.64$  years,  $SD = 5.30$ ). To determine sample size, we performed power calculations using the average observed effect size



from Studies 1 and 2. Given a critical alpha of .05 and an average effect size of  $d = .44$ , to detect such an effect with 95% power, we would need a total sample size of about 230 participants (Faul et al., 2007). Students were recruited via several websites (e.g., Facebook) for a study on academic tasks. To be eligible, students had to be currently enrolled in a university. Students could win gift cards in a lottery for their participation. The study was a scenario study with four experimental conditions (responsibility-for-self condition, responsibility-for-others condition, responsibility-for-self-and-others condition vs. no-responsibility-control condition).

### Procedure

**Academic wish, expectations, and incentive.** We asked students to name a class in which they might be giving a presentation and to indicate the grade they aim to achieve in that class. Furthermore, we measured students' expectations of success by two items ("How likely is it that you will achieve your desired grade?" and "How likely is it that you will give an excellent presentation?"). We also measured their incentive by two items ("How important is it to you to achieve your desired grade?" and "How important is it to you to give an excellent presentation?"). We used 7-point scales (1 = *not at all*, 7 = *very*). Because the two expectations items and the two incentive items correlated positively,  $r = .70$  and  $r = .57$ , respectively,  $ps < .001$ , we combined them into one index of expectations and one index of incentive, respectively.

**Responsibility manipulation and assessment of self-regulatory thought.** Following Sevincer et al. (2017, Study 2), we embedded the experimental manipulation in the instructions to assess self-regulatory thought. We asked the students to imagine that they will have to prepare a presentation in the named class together with two fellow-students. In the responsibility-for-self condition, students learned that their presentation will influence their own course grade but *not* that of their fellows; in the responsibility-for-others condition, they learned their presentation will *not* influence their own course grade but that of their fellows; and in the responsibility-for-self-and-others condition, they learned their presentation will influence their own course grade as well as that of their fellows. The students in the no-responsibility control condition learned that their presentation will influence neither their own course grade nor that of their fellows. Students wrote down their thoughts in a designated field. We assessed self-regulatory thought using the same procedure and coding scheme as in Studies 1 and 2. Of the 240 students, two (1%) listed only keywords. Two trained raters blind to conditions independently coded the statements. Agreement was 80% ( $\kappa = .71$ ).

**Manipulation check.** As a manipulation check, to verify that the students in the four conditions correctly understood the instructions to imagine the scenario, they answered the following questions: "How much do you think your presentation

will influence your own course grade?" and "How much do you think your presentation will influence the course grades of your fellow students" (7-point scales; 1 = *not at all*, 7 = *very*). Students then completed a demographic questionnaire.<sup>3</sup>

## Results

### Descriptive analyses

**Expectations and incentive, and generated statements.** Table 1 depicts the descriptive statistics for expectations, incentive, and the number of generated statements. Neither expectations nor incentive differed between conditions,  $F_s < 0.41$ ,  $ps > .74$ .

**Manipulation check.** Participants differed between conditions in that they imagined the scenarios according to the respective instructions (see supplemental materials).

**Self-regulatory thought.** Table 4 depicts the frequency of the modes of thought in the four conditions. As in Studies 1 and 2, students who generated only statements categorized as "other" were excluded and self-regulatory thought was dummy-coded into mental contrasting (0) versus not (1).

**Effect of responsibility for self or/and others on mental contrasting.** To test our hypothesis that imagining responsibility versus imagining no responsibility leads students to use mental contrasting, we conducted binary logistic regression analyses with the dummy-coded mental contrasting variable as the dependent variable (Table 5, upper part). In the three responsibility conditions combined, marginally more students used mental contrasting (32%) than of those in the no-responsibility-control condition (21%),  $p = .097$ . When we added expectations, incentive, and the number of statements as predictors in the regression equations, the pattern remained the same.<sup>4</sup>

Exploratory analyses revealed that the use of mental contrasting did not differ between the three responsibility conditions. When we compared the number of mental contrasting participants between the no-responsibility-control condition and each of the three responsibility conditions, only the difference between the no-responsibility-control condition (21%) and the responsibility-for-self condition (37%) was significant. We describe the analyses in the supplemental material.

## Discussion

Of the students who imagined giving a group presentation that would either influence their own course grade, that of their fellow students, or both their own grade and that of their fellows, marginally more students used mental contrasting than of those who imagined that their presentation would neither influence their own nor their fellows' grades. Apparently, feeling responsibility for oneself or others tended to lead students to use mental contrasting rather than feeling no responsibility. The effect size was small to medium

**Table 4.** Studies 3 and 4: Number of Students Engaging in the Different Modes of Thought in Each Condition.

Responsibility condition	<i>n</i>	Self-regulatory thought				
		Mental contrasting	Indulging	Dwelling	Reverse contrasting	Other
Study 3						
Self	56	21 (37)	16 (29)	9 (16)	5 (9)	5 (9)
Others	63	21 (33)	6 (10)	16 (25)	18 (29)	2 (3)
Self and Others	68	18 (26)	7 (10)	19 (28)	21 (31)	3 (4)
Control	53	11 (21)	28 (53)	4 (8)	8 (15)	2 (4)
Study 4						
Self	67	16 (24)	22 (33)	15 (22)	10 (15)	4 (6)
Others	63	19 (30)	20 (32)	12 (19)	8 (13)	4 (6)
Self and Others	62	18 (29)	21 (34)	13 (21)	5 (8)	5 (8)
Control	68	4 (6)	39 (57)	12 (18)	10 (15)	3 (4)

Note. Percentages of the modes of thought within each condition in parenthesis.

(odds ratio transformed into  $d = 0.35$ ), and the pattern remained marginally significant when we controlled for expectations, incentive, and the number of generated statements.

Study 3 had the following limitations, which we addressed in Study 4. First, in Study 3, we used a hypothetical scenario to manipulate responsibility. Because hypothetical scenarios have limited ecological validity, in Study 4 we manipulated responsibility by asking participants to name an important personal wish from their everyday life that either involved responsibility (for themselves, for others, or themselves and others) or no responsibility. Second, the manipulation check in Study 3 focused on whether participants correctly understood the hypothetical scenario rather than whether they felt responsibility. Therefore, in Study 4, we used a manipulation check that focused on whether participants in the responsibility conditions indeed named personal wishes that involved more responsibility than those in the control condition. Third, the difference in the number of participants using mental contrasting between the no-responsibility-control condition and the three responsibility conditions combined was only marginally significant ( $p = .097$ ); it was significant only when comparing the no-responsibility-control condition with the responsibility-for-self condition.

The relatively small differences in the use of mental contrasting between the control condition and the responsibility conditions might be explained by the instructions in the control condition: Participants were asked to imagine they would be giving a classroom presentation with no impact on their own or their fellows' grades. The students in this condition may still have felt some degree of responsibility for giving a good presentation, even though the presentation would not impact their grades. Therefore, in the control condition in Study 4, we explicitly asked participants to name personal wishes that involve no responsibility either for themselves or others.

## Study 4: Responsibility for an Idiosyncratic Wish

### Method

**Participants and design.** Participants were 260 Mechanical Turk workers recruited for a study on personal wishes (134 male, 124 female, 2 unidentified,  $M_{\text{age}} = 37.8$  years,  $SD = 10.6$ ). We performed power calculations using the average observed effect size from Studies 1 to 3. Given a critical alpha of .05 and an average effect size of  $d = 0.41$ , to detect such an effect with 95% power, we would need a total sample size of 260 participants (Faul et al., 2007). We preregistered the study on: <https://aspredicted.org/9db8f.pdf>. Participants received US\$0.80 for taking part. The study used the same design as Study 3 with four experimental conditions (responsibility-for-self condition, responsibility-for-others condition, responsibility-for-self-and-others condition vs. no-responsibility-control condition).

### Procedure

**Idiosyncratic wish and responsibility manipulation.** We embedded the experimental manipulation in the instructions to name an important personal wish. In the responsibility-for-self condition, we asked participants to name a wish that involves responsibility for themselves but not others (they named, e.g., "I wish to get slimmer"); in the responsibility-for-others condition, the named wish should involve responsibility for others but not themselves (e.g., "I want to help my mom getting better"); in the responsibility-for-self-and-others condition, the wish should involve responsibility for both themselves and others (e.g., "to support myself and my friends in debt"); and in the no responsibility control condition, neither for themselves nor for others (e.g., "I wish to win the lottery").

**Manipulation check.** Participants answered the following questions: "How much responsibility overall does your wish

**Table 5.** Studies 3 and 4: Summary of Hierarchical Binary Logistic Regression Analyses for the Dummy-Coded Responsibility Condition Variable (No Responsibility Control Condition vs. the Other Three Conditions Combined), Expectations, Incentive, and Number of Statements Predicting the Dummy-Coded Mental Contrasting Variable (Mental Contrasting vs. Not).

Predictor	$\Delta R^2$	B	SE B	p	OR	95% CI
Study 3						
Step 1	.02					
Responsibility condition		0.62	.38	.097	1.87	[0.89, 3.89]
Step 2	.01					
Responsibility condition		0.66	.38	.08	1.93	[0.92, 4.05]
Expectations		0.18	.14	.21	1.19	[0.91, 1.57]
Incentive		-0.17	.15	.25	0.84	[0.63, 1.13]
Number of statements		0.01	.03	.96	1.00	[0.95, 1.05]
Study 4						
Step 1	.11*					
Responsibility condition		1.86	0.54	.001	6.42	[2.22, 18.54]
Step 2	.03					
Responsibility condition		1.99	0.57	.001	7.31	[2.39, 22.35]
Expectations		0.05	0.11	.66	1.05	[0.85, 1.29]
Incentive		-0.07	0.16	.65	0.92	[0.67, 1.28]
Number of statements		0.07	0.03	.02	1.07	[1.01, 1.13]

Note. \* $p < .05$ . OR = odds ratio; CI = confidence interval.

**Table 6.** Study 4: Means and Standard Deviations (in Parenthesis) for the Three Manipulation Check Items in Each Condition.

Responsibility condition	n	Manipulation check items		
		Responsibility overall	Responsibility for self	Responsibility for others
Self	67	6.16 (1.11)	6.63 (0.81)	1.82 (1.72)
Others	63	6.33 (0.97)	2.94 (2.21)	6.29 (1.31)
Self and Others	62	6.50 (0.78)	6.40 (1.08)	5.65 (2.59)
Control	68	2.46 (2.06)	2.06 (1.79)	1.79 (1.59)

involve?" "How much responsibility for yourself does your wish involve?" and "How much responsibility for others does your wish involve?" (7-point scales; 1 = *no responsibility at all*, 7 = *very much responsibility*).

**Expectations and incentive.** Participants then indicated their expectations and incentive using the same items and answer scales as in Study 2.

**Assessment of self-regulatory thought.** We measured self-regulatory thought as in Studies 1 to 3. Of the 260 participants, two (1%) listed only keywords. Two trained raters blind to conditions independently coded the statements. Agreement was 88% ( $\kappa = .82$ ). To conclude, participants completed a demographic questionnaire.

## Results

### Descriptive analyses

**Expectations, incentive, and generated statements.** Table 1 depicts the descriptive statistics for expectations, incentive, and the number of generated statements. Expectations and

incentive differed between conditions,  $F_s > 2.90$ ,  $p_s > .036$ . Post hoc tests using the Ryan procedure (REGWQ) as recommended by Howell (2009) indicated that participants in the control condition had lower expectations ( $M = 3.72$ ,  $SD = 1.91$ ) and incentive ( $M = 5.81$ ,  $SD = 1.33$ ) than those in the three responsibility conditions combined,  $p_s < .026$ . Therefore, as in Studies 1 to 3, we controlled for expectations and incentive.

**Manipulation check.** As can be seen in Table 6 and as predicted, the *overall* responsibility that participants' wishes involved did not differ between the three responsibility conditions,  $F(2, 189) = 1.94$ ,  $p = .15$ , but was higher than in the no-responsibility control condition (-1, -1, -1, 3 contrast),  $t(256) = 20.46$ ,  $p < .001$ . Moreover, in the responsibility-for-self and responsibility-for-self-and-others condition participants' wishes involved more responsibility for *themselves* than in the responsibility-for-others and the control condition (1, -1, 1, -1 contrast),  $t(256) = 20.59$ ,  $p < .001$ . And in the responsibility-for-others and responsibility-for-self-and-others condition, their wishes involved more responsibility for *others* than in the responsibility-for-self and the control

condition (-1, 1, 1, -1 contrast),  $t(256) = 21.77, p < .001$ . The pattern indicates that our responsibility manipulation was successful.

**Self-regulatory thought.** Table 4 depicts the frequency of the modes of thought in the four conditions. As in Studies 1 to 3 the participants who generated only statements categorized as “other” were excluded. Self-regulatory thought was coded into mental contrasting (0) versus not (1).

**Effect of responsibility for self or others on mental contrasting.** We conducted analogous analyses as in Study 3 (Table 5, lower part). As predicted, of the participants in the three responsibility conditions combined more participants used mental contrasting (30%) than of those in the control condition (6%),  $p = .001$ . When we added expectations, incentive, and the number of statements as predictors in the regression equations, the pattern remained the same. As in Study 3, the use of mental contrasting did not differ between the three responsibility conditions. When we compared the number of mental contrasting participants between the no-responsibility-control condition and each of the three responsibility conditions, however, all three comparisons were significant. We describe the analyses in the supplemental material.

## Discussion

Of the participants who elaborated on a personal wish that involved either responsibility for themselves, for others, or for themselves and others, more participants used mental contrasting than of those who elaborated on a personal wish that involved no responsibility. The effect size was large (OR transformed into  $d = 1.03$ ), and the pattern was robust when we controlled for expectations, incentive, and the number of statements.

## General Discussion

We investigated whether people would be more inclined to use mental contrasting when they feel or take responsibility rather than no responsibility. Studies 1 and 2 were correlational studies. Employees who felt more responsibility for completing an important team project (Study 1) and participants who felt and actively took more responsibility for improving the welfare of society (Study 2) were more likely to use mental contrasting than those who felt or took less responsibility. Studies 3 and 4 were experiments. Of the students who imagined giving a class presentation for which they had responsibility marginally more tended to use mental contrasting (Study 3), and of the students who elaborated on an idiosyncratic wish that involved responsibility (Study 4) more used mental contrasting than of those who did not experience responsibility.

The results emerged for responsibility in different domains (work, welfare, academic, life in general), for responsibility for oneself (Studies 1, 3, and 4), others (Studies 1, 3, and 4),

the society at large (Study 2), for feelings of responsibility (Studies 1 and 2) and responsibility that was actively taken (Study 2), when responsibility was self-reported (Studies 1 and 2) or experimenter-observed (Study 2), for dispositional responsibility (Studies 1 and 2) and situationally induced responsibility (Studies 3 and 4), for standardized wishes (Studies 1 and 3) and individualized wishes (Studies 2 and 4), for different samples (employees, MTurk users, and students), and for participants from different cultures (Germany and the United States). A meta-analysis, described in the supplemental material, yielded an average weighted effect size of  $d = 0.58, p < .00001$ , across all four studies.

## Implications for Research on Mental Contrasting

Participants were more likely to use mental contrasting when they had high rather than low responsibility. Even when responsibility was high, however, only a minority of the participants used mental contrasting (between 24% and 32%). This observation is consistent with earlier findings (Sevincer et al., 2015, 2017, 2018) and highlights that developing interventions teaching people to use mental contrasting may help people to take action and accomplish the outcomes they feel responsible for. Because people who shy away from taking on responsibility are those who are least likely to use mental contrasting, such interventions may benefit these people even more than those who spontaneously take on responsibility.

## Implications for Research on Responsibility

In Study 1, the responsibility participants felt for completing an important team project predicted mental contrasting. The responsibility they were given as measured by the number of team members was not significantly related to mental contrasting ( $p = .21$ ) although the relationship was in the same direction. Also, felt responsibility was not related to given responsibility ( $r = .06$ ). Perhaps the number of team members was a too crude measure for given responsibility because the felt and the actual responsibility of single team members may also depend on their experience, position, and the team politics. Alternatively, we speculate that people may feel or take no responsibility even though they were given responsibility and vice versa, and it is the responsibility they feel or take rather than the responsibility they are given that is related to whether they spontaneously self-regulate by mental contrasting.

Furthermore, in Studies 3 and 4, more participants used mental contrasting when they were induced to feel responsibility for either themselves, others, or both themselves and others than when they felt no responsibility. The proportion of mental contrasting participants did not differ between the three conditions that involved responsibility, however. Feeling responsible for oneself thus seems to trigger spontaneous self-regulation by mental contrasting just as feeling responsible for others does, and, moreover, feeling

responsible for both oneself *and* others has no incremental effect on spontaneous mental contrasting. Apparently, feeling or taking responsibility by itself leads people to use mental contrasting, irrespective of for whom people feel responsible.

### **The Link Between Responsibility and Mental Contrasting**

We suggested that feeling responsibility leads people to use mental contrasting. However, the correlational design of Studies 1 and 2 does not allow drawing causal inferences. Thus, these studies, at first sight may mean that spontaneously using mental contrasting led participants to feel more responsibility. Indeed, in previous research mental contrasting led participants to feel more responsibility for attaining a desired outcome provided they had high expectations of success; if they had low expectations, mental contrasting led them to feel less responsibility (Oettingen et al., 2001, Study 1). In the present Studies 1 and 2 however, we measured participants' chronic responsibility before we measured whether they spontaneously used mental contrasting when thinking about their desired outcome. Thus, it is impossible that the one-time use of mental contrasting influenced participants' prior feelings of responsibility. This interpretation is further supported by the experimental evidence from Studies 3 and 4 showing that being induced to feel responsibility caused participants to spontaneously use mental contrasting.

In sum, previous research suggested that using mental contrasting can help people to increase their feelings of responsibility. The present work goes beyond these findings by suggesting that there may be a bidirectional relationship between responsibility and mental contrasting: People who feel or take responsibility in their daily life are more likely to use mental contrasting and, moreover, situationally induced responsibility causes people to use mental contrasting.

### **Limitations and Future Directions**

Several limitations provide directions for future work. First, we measured a one-time use of mental contrasting. Future research may use longitudinal designs to look at whether responsibility is linked to the repeated use of mental contrasting over time. In this vein, one may also investigate whether the use of mental contrasting is an individual difference in the sense that some people chronically use mental contrasting more than others. Second, it is an open question whether the participants in our studies intentionally initiated mental contrasting as a purposeful problem-solving study or whether they spontaneously associated the desired future with the present reality in their stream of thought. Third, here we reasoned that people with responsibility use mental contrasting because it helps them to get involved. Future work may investigate whether the use of mental contrasting indeed

mediates the effect of a sense of responsibility on taking action. Finally, our participants were from individualistic cultures (United States and Germany). Because mental contrasting may be particularly effective for pursuing individualist wishes in individualist cultures and collectivist wishes in collectivist cultures (Kizilcec & Cohen, 2017; Oettingen et al., 2008), future research may look at the degree to which people from individualist versus collectivist cultures spontaneously use mental contrasting in taking responsibility for solving culture-matched tasks.

### **Conclusion**

Going back to the student at the beginning who is preparing a class presentation together with a group of fellow students, our results suggest that feeling responsible for her fellows and/or for herself would make her more likely to spontaneously self-regulate by mental contrasting. Indeed, in our studies, participants who felt and actively took the most responsibility for others, the society at large, or for themselves were more inclined to use mental contrasting. Feeling responsible, then, regardless of for others or oneself seems to be a valid motor for self-regulation.

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### **Notes**

1. In all four studies, we computed explorative follow-up analyses to investigate whether responsibility predicted mental contrasting compared with each of the other modes of thought (indulging, dwelling, reverse contrasting). We present the analyses in the supplemental material. All comparisons were in the predicted direction.
2. In Study 2, additional measures were collected not discussed here, including locus of control (Internal-External Locus of Control Scale; Kovaleva et al., 2012), belief in a just world (General Just World Scale; Dalbert et al., 1987), and social desirability (Social Desirability Scale Gamma; Kemper et al., 2012).
3. In Study 3, additional measures were collected not discussed here, including positive and negative affect (German version; Krohne et al., 1996), implicit theories of intelligence (German version; Spinath & Schöne, 2003), test anxiety (German

version; Wacker et al., 2008), and self-control (German version; Bertrams & Dickhäuser, 2009).

4. In Studies 3 and 4, we also conducted explorative follow-up analyses to investigate whether each of the responsibility conditions led participants to use mental contrasting. We describe the analyses in the supplemental material.

### Supplemental Material

Supplemental material is available online with this article.

### References

- Bandura, A., Underwood, B., & Fromson, M. E. (1975). Disinhibition of aggression through diffusion of responsibility and dehumanization of victims. *Journal of Research in Personality, 9*, 253–269.
- Berkowitz, L., & Daniels, L. R. (1964). Affecting the salience of the social responsibility norm: Effects of past help on the response to dependency relationships. *The Journal of Abnormal and Social Psychology, 68*, 275–281.
- Bertrams, A., & Dickhäuser, O. (2009). Messung dispositioneller Selbstkontroll-Kapazität [Measuring dispositional self-control capacity]. *Diagnostica, 55*, 2–10.
- Bierhoff, H. W. (2000). Skala der sozialen Verantwortung nach Berkowitz und Daniels: Entwicklung und Validierung [The social responsibility scale by Berkowitz and Daniels: Development and validation]. *Diagnostica, 46*, 18–28.
- Bryan, C. J., & Hershfield, H. E. (2013). You owe it to yourself: Boosting retirement saving with a responsibility-based appeal. *Journal of Experimental Psychology: General, 141*, 429–432.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum.
- Dalbert, C., Montada, L., & Schmitt, M. (1987). Glaube an eine gerechte Welt als Motiv: Validierungskorrelate zweier Skalen [Belief in a just world: Validation correlates of two scales]. *Psychologische Beiträge, 29*, 596–615.
- Darley, J. M., & Latané, B. (1968). Bystander intervention in emergencies: Diffusion of responsibility. *Journal of Personality and Social Psychology, 8*, 377–383.
- Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*, 113–126.
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191.
- Fischer, P., Krueger, J. I., Greitemeyer, T., Vogrinic, C., Kastenmüller, A., Frey, D., . . . Kainbacher, M. (2011). The bystander-effect: A meta-analytic review on bystander intervention in dangerous and non-dangerous emergencies. *Psychological Bulletin, 137*, 517–537.
- Freeman, S., Walker, M. R., Borden, R., & Latane, B. (1975). Diffusion of responsibility and restaurant tipping: Cheaper by the bunch. *Personality and Social Psychology Bulletin, 1*, 584–587.
- Gollwitzer, A., Oettingen, G., Kirby, T., Duckworth, A., & Mayer, D. (2011). Mental contrasting facilitates academic performance in school children. *Motivation and Emotion, 35*, 403–412.
- Hackman, J. R., & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology, 60*, 159–170.
- Heider, F. (1958). *The psychology of interpersonal relations*. Wiley.
- Howell, D. C. (2009). *Statistical methods for psychology*. Cengage Learning.
- Kaiser, F. G., Ranney, M., Hartig, T., & Bowler, P. A. (1999). Ecological behavior, environmental attitude, and feelings of responsibility for the environment. *European Psychologist, 4*, 59–74.
- Kappes, A., & Oettingen, G. (2014). The emergence of goal pursuit: Mental contrasting connects future and reality. *Journal of Experimental Social Psychology, 54*, 25–39.
- Kappes, A., Singmann, H., & Oettingen, G. (2012). Mental contrasting instigates goal pursuit by linking obstacles of reality with instrumental behavior. *Journal of Experimental Social Psychology, 48*, 811–818.
- Kappes, A., Wendt, M., Reinelt, T., & Oettingen, G. (2013). Mental contrasting changes the meaning of reality. *Journal of Experimental Social Psychology, 49*, 797–810.
- Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology, 65*, 681–706.
- Kemper, C. J., Beierlein, C., Bensch, D., Kovaleva, A., & Rammstedt, B. (2012). Eine Kurzskaala zur Erfassung des Gamma-Faktors sozial erwünschten Antwortverhaltens: Die Kurzskaala Soziale Erwünschtheit-Gamma (KSE-G). [A short scale to assess socially desirable responding: The short scale social desirability gamma (KSG-G)]. [https://www.gesis.org/fileadmin/\\_migrated/content\\_uploads/KSE\\_G\\_Workingpaper\\_01.pdf](https://www.gesis.org/fileadmin/_migrated/content_uploads/KSE_G_Workingpaper_01.pdf)
- Kizilcec, R. F., & Cohen, G. L. (2017). Eight-minute self-regulation intervention raises educational attainment at scale in individualist but not collectivist cultures. *Proceedings of the National Academy of Sciences, 114*, 4348–4353.
- Kovaleva, A., Beierlein, C., Kemper, C. J., & Rammstedt, B. (2012). Eine Kurzskaala zur Messung von Kontrollüberzeugung: Die Skala Internale-Externale-Kontrollüberzeugung-4 (IE-4). [A short scale to measure control beliefs: The scale internal-external control beliefs-4 (IE-4)]. <https://www.ssoar.info/ssoar/handle/document/31209>
- Kravitz, D. A., & Martin, B. (1986). Ringelmann rediscovered: The original article. *Journal of Personality and Social Psychology, 50*, 936–941.
- Krohne, H. W., Egloff, B., Kohlmann, C. W., & Tausch, A. (1996). Untersuchungen mit einer deutschen Version der “Positive and Negative Affect Schedule” (PANAS) [Examinations with a German version of the Positive and Negative Affect Schedule (PANAS)]. *Diagnostica, 42*, 139–156.
- Lenhard, W., & Lenhard, A. (2016). *Calculation of effect sizes*. Psychometrica. [https://www.psychometrica.de/effect\\_size.html](https://www.psychometrica.de/effect_size.html)
- Liere, K. D., & Dunlap, R. E. (1978). Moral norms and environmental behavior: An application of Schwartz’s norm-activation model to yard burning. *Journal of Applied Social Psychology, 8*, 174–188.
- McWilliams, A., & Siegel, D. (2001). Corporate social responsibility: A theory of the firm perspective. *The Academy of Management Review, 26*, 117–127.
- Milgram, S. (1974). *Obedience to authority: An experimental view*. Harper & Row.
- Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*, 247–259.

- Oettingen, G. (2000). Expectancy effects on behavior depend on self-regulatory thought. *Social Cognition, 18*, 101–129.
- Oettingen, G., Mayer, D., Sevincer, A. T., Stephens, E. J., Pak, H., & Hagenah, M. (2009). Mental contrasting and goal commitment: The mediating role of energization. *Personality and Social Psychology Bulletin, 35*, 608–622.
- Oettingen, G., Pak, H., & Schetter, K. (2001). Self-regulation of goal setting: Turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology, 80*, 736–753.
- Oettingen, G., & Sevincer, A. T. (2018). Fantasy about the future as friend and foe. In G. Oettingen, A. T. Sevincer, & P. M. Gollwitzer (Eds.), *The psychology of thinking about the future* (pp. 127–149). Guilford.
- Oettingen, G., Sevincer, A. T., & Gollwitzer, P. M. (2008). Goal pursuit in the context of culture. In R. Sorrentino & S. Yamaguchi (Eds.), *Handbook of motivation and cognition across cultures* (pp. 191–211). Elsevier.
- Rushton, J. P., Chrisjohn, R. D., & Fekken, G. C. (1981). The altruistic personality and the self-report altruism scale. *Personality and Individual Differences, 2*, 293–302.
- Schmidt, K. H., & Kleinbeck, U. (1999). Job Diagnostic Survey (JDS-deutsche Fassung). In H. Dunckel (Ed.), *Handbuch psychologischer Arbeitsanalyseverfahren* (pp. 205–230). Hochschulverlag.
- Schwartz, S. H. (1977). Normative influences on altruism. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10, pp. 221–279). Academic Press.
- Sevincer, A. T., Busatta, P. D., & Oettingen, G. (2014). Mental contrasting and transfer of energization. *Personality and Social Psychology Bulletin, 40*, 139–152.
- Sevincer, A. T., Mehl, P. J., & Oettingen, G. (2017). Well self-regulated people use mental contrasting. *Social Psychology, 48*, 348–364.
- Sevincer, A. T., & Oettingen, G. (2013). Spontaneous mental contrasting and selective goal pursuit. *Personality and Social Psychology Bulletin, 39*, 1240–1254.
- Sevincer, A. T., & Oettingen, G. (2015). Future thought and the self-regulation of energization. In G. H. E. Gendolla, M. Tops, & S. Koole (Eds.), *Biobehavioral approaches to self-regulation* (pp. 315–329). Springer.
- Sevincer, A. T., Schlier, B., & Oettingen, G. (2015). Mental contrasting and ego-depletion. *Motivation and Emotion, 39*, 876–891.
- Sevincer, A. T., Tessmann, P., & Oettingen, G. (2018). Demand to act and use of mental contrasting. *Social Psychology, 49*, 344–359.
- Sheeran, P., Harris, P., Vaughan, J., Oettingen, G., & Gollwitzer, P. M. (2013). Gone exercising: Mental contrasting promotes physical activity among overweight, middle-aged, low-SES fishermen. *Health Psychology, 32*, 802–809.
- Spinath, B., & Schöne, C. (2003). Subjektive Überzeugungen zu Bedingungen von Erfolg in Lern- und Leistungskontexten und deren Erfassung [Subjective beliefs about success in learning and teaching and their assessment]. In J. Stiensmeier-Pelster & F. Rheinberg (Eds.), *Diagnostik von Motivation und Selbstkonzept* (pp. 15–27). Hogrefe.
- Wacker, A., Jaunzeme, J., & Jaksztat, S. (2008). Eine Kurzform des Prüfungsängstlichkeitsinventars TAI-G [A short form of the Test Anxiety Inventory TAI-G]. *Zeitschrift für Pädagogische Psychologie, 22*, 73–81.