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Mental contrasting and problem-solving in romantic relationships: A dyadic behavioral observation study

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Abstract

We investigated how mental contrasting, a self-regulation strategy, affects relationship problem-solving in 105 mixed-gender couples. Couples were assigned to a mental contrasting (juxtaposing the desired future with the main inner obstacle) or indulging (imagining only the desired future) condition. We reassessed problem resolution 2 weeks later. Actor-partner interdependence model analyses revealed that mental contrasting improved problem resolution over this period for problems perceived as important to resolve. Right after the intervention, we also recorded couples' problem-solving behavior during a Zoom discussion among the partners. Men in the mental contrasting (vs. indulging) condition showed more self-disclosure, especially of feelings, attitudes, and behaviors. Women in the mental contrasting condition were more selective when suggesting solutions. Mental contrasting appears to foster problem-solving by enabling men to engage in self-disclosure, making women selective about solution suggestions, and enabling both women and men to effectively implement solutions, especially for high-importance problems.

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Many romantic couples regularly experience problems, which are often accompanied by considerable frustration (Meyer & Sledge, 2022). How couples navigate these problems is closely associated with their relationship quality and longevity. Effectively managing problems (e.g., being constructive or emotionally responsive) coincides with greater satisfaction, happiness, and intimacy, whereas ineffective management (e.g., being defensive or destructive; Gottman, 1994; Jacobson & Margolin, 1979) coincides with greater distress, frustration, and risk for dissolution (Baker et al., 2013; Robles et al., 2014). To navigate challenges effectively, many couples seek counseling in the form of intervention or prevention programs (Bradbury & Bodenmann, 2020). However, couples whose relationship satisfaction is not critically affected often hesitate to pursue counselling, partly due to the substantial investment of time and financial resources involved (Hubbard & Harris, 2020). To make counselling more accessible, various digital intervention and prevention programs have been developed (Knopp et al., 2023). Nonetheless, these programs are largely prevention-focused or require some form of interaction with a coach to address ongoing problems. Currently, empirically tested self-administered (i.e., requiring no external guidance) digital interventions are lacking that can be tailored to a couple's coping with ongoing relationship problems.

One self-administered self-regulation strategy that is particularly effective for engaging with interpersonal problems perceived as highly important is mental contrasting (Jöhnk et al., 2025; Oettingen et al., 2001). In *mental contrasting*, people mentally juxtapose their desired future (e.g., spending more time with the partner, maintaining a tidy home) with their main inner obstacle preventing them from achieving this desired future (e.g., insecurity, laziness). This process allows mental contrasting to be tailored to the wishes and obstacles that partners have in their relationship. Rather than prescribing specific actions, mental contrasting enables individuals themselves to identify solutions suited to overcome their unique obstacles on the way to fulfilling their unique wishes for the future.

Mental contrasting has shown promise in romantic relationships, including increasing sensible conciliatory behavior (Schrage et al., 2020), reducing insecurity-driven behavior (Houssais et al., 2013), and increasing the engagement in resolving ongoing relationship problems (Jöhnk et al., 2025). Also, people with more compassion and who take on more responsibility are more likely to engage in mental contrasting (Sevincer et al., 2020; Tamim et al., 2024). Building on this research, we guided romantic couples through a mental contrasting exercise, examined how mental contrasting facilitates resolving mutually perceived relationship problems, and observed its impact on problem-solving behaviors (e.g., self-disclosure, solution suggestions) in predominantly satisfied couples. Furthermore, as women and men might differ in their problem-solving strategies (Horne & Johnson, 2018; Keener et al., 2012; Winstok et al., 2018), we explored whether mental

contrasting affects women and men differently. Our study examines mental contrasting as a cost- and time-efficient tool that could enhance couple counseling and inform the development of self-administered interventions for improving relationship problem-solving.

Relationship problem-solving

Relationship problems are often characterized by disagreement, tension, or hostility between romantic partners. Such problems may stem from conflicting needs, goals, opinions, or interests (Randall & Bodenmann, 2009). Among the most prevalent problem topics are communication, parenting, finances, household chores, and personal or partner habits (Meyer & Sledge, 2022). A relationship problem can be caused by both partners' actions (e.g., communication), by one of the partners' actions (e.g., substance abuse), by incompatibilities between partners (e.g., political beliefs), or by factors outside of the relationship (e.g., poor labor market conditions; Baker & McNulty, 2020). Here, we focus on ongoing relationship problems. That is, problems from any topic that have been the reason for disagreements between partners but so far remained unresolved.

Resolving relationship problems is a difficult task. Some relationship problems might even be entirely unresolvable (Gottman & Gottman, 2008). For example, taxing life circumstances such as terminal illness of a parent can lead to disagreements between partners and place an unresolvable, lasting strain on the relationship. We refer to both resolving a relationship problem and minimizing a problem's severity as *problem resolution*. The Relationship Problem Solving Model (Baker & McNulty, 2020) describes problem-solving in four stages: (1) recognizing a problem and understanding its sources, (2) identifying and evaluating solutions, (3) implementing a solution, and (4) reappraising the problem.

While there is no one-size-fits-all approach to resolving relationship problems, research suggests that some communication strategies are generally more effective than others. Effective problem-solving is typically characterized by mutual, constructive, and responsive behaviors, such as expressing one's own thoughts and emotions openly, showing empathy, and suggesting realistic solutions. In contrast, less effective problem-solving involves defensive, avoidant, or aggressive strategies, such as criticism, contempt, or stonewalling (Gottman, 1994, 1998; Hahlweg & Richter, 2010; Johnson, 2019).

Still, which behaviors support or hinder problem resolution depends not only on the communication behavior itself but also on the context (Overall & McNulty, 2017). For instance, behaviors that promote short-term harmony (e.g., expressing affection, softening a conflict) may delay taking the problem on and impede eventual resolving problems (McNulty, 2010), whereas behaviors that may feel uncomfortable in the moment (e.g., criticizing, expressing anger) might underscore the severity of the issue and thereby stimulate the problem-solving process (McNulty & Russell, 2010). Thus, while some communication strategies are generally more effective, each problem may still benefit from an approach tailored to the specific circumstances. A self-regulation strategy that allows people to identify approaches tailored to their and their partners' idiosyncratic wishes and challenges is mental contrasting (Oettingen, 2012; Oettingen et al., 2001).

Mental contrasting

Mental contrasting is a self-regulation strategy that promotes behavior change through cognitive and motivational mechanisms (summaries by Oettingen, 2012, 2026; Oettingen & Sevincer, 2018). When using mental contrasting, individuals identify an important yet achievable wish, find and imagine the most positive aspect associated with fulfilling that wish, and then identify and imagine the main inner obstacle in the current reality preventing them from fulfilling the wish. Imagining the main inner obstacle leads individuals to consider various ways for addressing that obstacle. If the obstacle is perceived as surmountable, mental contrasting elicits strong goal-directed commitment (Oettingen et al., 2001); if the obstacle is perceived as insurmountable, mental contrasting elicits active disengagement, preventing continued frustrations and wasted energy (Oettingen et al., 2016).

Mental contrasting is based in Fantasy Realization Theory (Oettingen, 2000; Oettingen et al., 2001), which describes three other modes of future thought: indulging (only imagining aspects of the desired future), dwelling (only imagining aspects of the current reality), and reverse contrasting (imagining aspects of the current reality first and then aspects of the desired future). In these three modes, the present reality is not perceived as an obstacle standing in the way of the desired future. Therefore, indulging, dwelling, and reverse contrasting do not allow people to explore ways of tackling the main inner obstacle. The effectiveness of mental contrasting compared to these modes of thought has been demonstrated for many life tasks (e.g., time management, physical activity, emotion regulation). This applies to experimentally induced mental contrasting, as in the present study, and to spontaneous use of mental contrasting. For instance, individuals who report to be more effective in self-regulation are also more likely to engage in mental contrasting (Oettingen, 2012; Sevincer et al., 2017).

Mental contrasting and problem-solving

Mental contrasting might be useful throughout Stages 1–3 of relationship problem-solving. That is, (1) when identifying the problem and its sources, (2) when generating solutions, and (3) when implementing solutions, respectively. In Stage 1, by confronting the internal obstacle that prevents a problem's resolution, individuals may identify and better understand the source of the problem. For instance, when identifying and imagining anger as the obstacle, people might realize that the anger is preventing constructive communication and identify ways to soften it (Jöhnk et al., 2025).

In Stage 2, mental contrasting may enable people to identify tailored behaviors to deal with individual obstacles (Oettingen et al., 2001). That is, mental contrasting makes people consider the probability that their behavior will lead to the desired outcome. For instance, romantic partners who were taught mental contrasting (vs. indulging) have shown to only attempt reconciliation with their partners when the chances of reconciliation were high, but refrained from futile, potentially relationship damaging attempts (Schrage et al., 2020).

In Stage 3, mental contrasting may help implementing solution strategies, because when an obstacle is perceived as surmountable, mental contrasting supports people to approach their desired future sooner and more persistently (Oettingen et al., 2001). When an obstacle is insurmountable, mental contrasting makes people let go from trying to overcome said obstacle (Oettingen et al., 2001). We argue that both overcoming surmountable obstacles (i.e., actively trying to resolve solvable problems) *and* accepting that some obstacles are insurmountable (i.e., letting go from trying to resolve unsolvable problems) will contribute to effective problem resolution. For instance, when someone who has mentally contrasted the wish to tidy the kitchen every evening before going to bed feels the inertia of doing so, mental contrasting will help them to overcome the inertia, feeling relieved after washing the dishes. However, in exceptional situations, such as returning home exhausted after a long day of work followed by a tedious evening having drinks with colleagues, they might acknowledge the circumstances, inform their partner that the dishes will remain unwashed for the night, and commit to cleaning them first thing in the morning. That way, both will be relieved rather than frustrated about the situation. In sum, we expect mental contrasting to improve problem resolution. As indulging is the most common mode of future thought people spontaneously use when thinking about interpersonal concerns (Sevincer et al., 2024), and because it leaves behavior unchanged (Oettingen, 2000), we will focus on comparing mental contrasting with indulging.

Hypothesis 1. Mental contrasting, compared to indulging, improves problem resolution.

Beyond the overall problem resolution, there are fine-grained behavioral determinants of how effective a couple's problem-solving is. Two speaker (vs. listener) behaviors are critical for successful problem-solving: Showing self-disclosure and generating solutions (Hahlweg & Kaiser, 2018; Kaiser et al., 1998). While mental contrasting does not teach these behaviors, it might allow people to utilize these behaviors when appropriate.

Self-disclosure

Self-disclosure is essential for fostering intimacy and understanding between partners (Greene et al., 2006; Reis & Shaver, 1988). *Self-disclosure* involves (a) expressing feelings, (b) attitudes, and behaviors, as well as (c) wishes and needs (Hahlweg, 2004). The ability to express one's emotions and attitudes is particularly important as it may help revealing underlying sources of problems (Baker & McNulty, 2020; Hahlweg & Kaiser, 2018).

During mental contrasting, individuals are prompted first to engage with their desired future. Thus, their wishes originating from their needs (Kappes et al., 2012) will be activated, although the same occurs when only indulging. But when using mental contrasting, individuals are then prompted to engage with the main internal obstacle preventing resolution. Often, the obstacle is a feeling (e.g., anger or insecurity), an attitude or belief (e.g., wanting to raise children in a certain way), or a habit (e.g., listening to the news after dinner instead of doing the dishes). When the obstacle is perceived as

surmountable, mental contrasting creates strong associative links between the desired future and the main obstacle regardless of whether it pertains to feelings, attitudes, or habits (Kappes & Oettingen, 2014). Mental contrasting also creates strong associative links between the obstacle and the instrumental behavior to overcome the obstacle (Kappes et al., 2012). These associative links then predict the exerted behavior once the obstacle occurs. In sum, mental contrasting ties people's desired future to the feelings, attitudes, and habits preventing said future from becoming reality. People using mental contrasting, compared to indulging, might therefore make wishes, feelings, attitudes, beliefs, and habits—all referred to as self-disclosure categories (Hahlweg, 2004)—subject of discussion with their partner.

Hypothesis 2. Mental contrasting, compared to indulging, increases self-disclosure

Solution suggestions

Generating solutions is another critical component of problem-solving in romantic relationships (Baker & McNulty, 2020; Hahlweg & Kaiser, 2018). When using mental contrasting, people consider both the desired future and the current reality, rather than just one of the two constituents. Mental contrasting may therefore broaden a couple's perspective on their situation (i.e., their *problem space*; Newell & Simon, 1972; for relating the problem space to mental contrasting, see Oettingen et al., 2001) and may help them realize that the current reality needs to be overcome in order to reach the desired future (Kappes et al., 2013). By imagining the obstacle of reality, couples will search and find problem-solving strategies to reach effective solutions. This might at first result in a series of solutions that are the basis for choosing the most effective one. In contrast, indulging may lead individuals to focus solely on the desired future, while neglecting obstacles standing in the way of the desired future. Without the obstacle as the target to overcome in mind, people who indulge should not search for or find effective solutions.

Hypothesis 3. Mental contrasting, compared to indulging, leads to more solution suggestions.

Perceptions of importance and solvability

Partners put more effort into resolving problems that they perceive as important (vs. unimportant) to tackle (Bandura, 2001; Overall et al., 2006) and that they perceive as solvable for them (vs. unsolvable; Johnson & Roloff, 1998; Roese & Sherman, 2007). Similarly, mental contrasting's effectiveness to instigate problem-solving activities depends on the perceived importance and solvability of the problem (Jöhnk et al., 2025; Schrage et al., 2020). *Perceived importance* refers to incentive value of solving the problem and *perceived solvability* refers to expectations of successfully solving it (see expectancy-value theory; Atkinson, 1957). Perceiving the resolution of a problem as important is required for mental contrasting to show its effects (Oettingen, 2000, 2012). That is, only for important problems, people should engage in problem solution when the

problem is perceived as solvable and actively let go from futile efforts when the problem is perceived as unsolvable. Therefore, we will explore whether our hypothesized effects are moderated by perceived importance and perceived solvability.

The present research

Previous mental contrasting studies show promising applications in relationship problem-solving. However, relationship problems have a dyadic nature (Baker & McNulty, 2020; Fitzsimons et al., 2015) that was neglected in previous mental contrasting studies. The positive outcome associated with resolving a mutual problem and the main inner obstacle preventing the resolution might be widely different for the partners of a given dyad. Still, previous mental contrasting studies allowed only one partner of a given romantic couple to use mental contrasting geared towards the idiosyncratic wish of resolving a dyadic problem (Jöhnk et al., 2025). Therefore, in the present research, we allow both partners to use mental contrasting geared towards the mutual wish of resolving a relationship problem. Also, while previous mental contrasting studies only investigated the outcome of problem resolution as perceived by one partner (Jöhnk et al., 2025), we investigate mental contrasting's effectiveness throughout all stages of relationship problem-solving, observing fine-grained problem-solving behaviors of both partners. Furthermore, women and men may respond differently to mental contrasting due to differences in their approaches to problem-solving. For example, in romantic relationships, women tend to self-disclose more (Dindia & Allen, 1992; Horne & Johnson, 2018), use more agentic strategies (e.g., making demands) during conflict (Keener et al., 2012), and have a higher willingness and readiness to escalate a conflict (Winstok et al., 2018) than men. Therefore, we also explore whether mental contrasting affects women's and men's problem-solving behavior differently.

Overview of the study

We conducted a dyadic behavioral observation study with two measurement points (T1 and T2) to investigate mental contrasting's effects on relationship problem-solving. At T1, we guided couples to identify an ongoing relationship problem and assessed the perceptions of importance of resolving the problem, solvability of the problem, and degree of problem resolution. Thereafter, we established the experimental conditions: Couples either did a mental contrasting or indulging intervention geared towards the resolution of their problem. Both partners of a couple worked through the intervention individually. Afterwards, we coded couples' behavior during a problem-solving discussion, focusing on self-disclosure and solution suggestions. Two weeks later, at T2, couples reappraised the degree of problem resolution.

Methods

Participants

Our sample comprised 105 mixed-gender couples (N = 210 individuals). Men were between 19 and 60 years of age (M = 27.5, SD = 6.8) and women between 19 and 55 (M =

25.9, *SD* = 6.2). The couples were together between 1 and 27 years (*M* = 3.5 years, *SD* = 3.7). The majority lived together (56.7 %) and 9.5 % reported having children. Both women and men reported overall high relationship satisfaction on a 7-point rating scale (men: *M* = 5.78, *SD* = 0.85; women: *M* = 5.79, *SD* = 0.86). Regarding occupational status, 60.5 % reported being university students or trainees, 24.8 % were employed full-time, 7.6 % were employed part-time, 3.3 % were unemployed, and 3.8 % indicated "other". Regarding education level, 5.3 % indicated a secondary school certificate, 47.6 % indicated a high school degree, and 47.1 % held the bachelor's or master's degree.

Procedure and measures

We recruited a convenience sample of couples through our department's participant pool, via flyers distributed on campus, on social media channels, and on websites promoting side jobs. We advertised the study for couples who would like to participate in a problem resolution intervention. We compensated participants with 15 € or course credit. Inclusion criteria were being at least 18 years old, being in a relationship for at least 1 year, and being fluent in German. All participants provided informed consent for participating in this study.

Each partner joined the experimental session (T1) online via Zoom from their laptop or PC. We asked partners to log in from separate devices and from separate rooms. When a couple did not have separate rooms available, the experimenter ensured that the partners could not see each other's screens and sat as far away from each other as possible. A trained experimenter guided the couples through the procedure using standardized instructions and slides shown on a shared screen. All experimenters involved in recruiting and behavioral coding were females.

Baseline measures (T1). The experimenter provided the participants with a link to the online questionnaire. First, we assessed the relationship satisfaction of each partner separately with the 7-item Relationship Assessment Scale (e.g., "In general, how satisfied are you with your relationship?"; Sander & Böcker, 1993). Participants gave their responses on a 7-point rating scale (1 = *slightly dissatisfied*, 7 = *highly satisfied*; α = .87).

Second, both partners separately created a list of up to three topics "that have been the cause of major disagreements" in their relationship. After the partners completed the questionnaire, they came together and discussed which problem to work on (adapted from Gottman, 1979). The instruction read, "Please talk to each other and choose a problem. The problem should (a) be important to you, (b) be something you would like to work on." The experimenter observed the partners to ensure that they agreed on the same problem. Participants then received a single choice list with their previously generated problems and indicated the topic they agreed on or wrote down the topic in a designated field if it was not included in their individual list. Third, the partners split up again to separately answer questions about the problem they agreed upon (i.e., perceptions of importance, solvability, and problem resolution). We assessed the perceived importance of resolving the problem and perceived solvability of the problem with two single items: "How important is it to you that you resolve this problem?" (importance) and "How likely is it

that you will resolve this problem?" (solvability). Both items had 7-point rating scales (1 = *not at all*, 7 = *very*; Jöhnk et al., 2025). Further, we assessed the perceived baseline problem resolution with two items: "How successful have you been in resolving the problem so far?" and "How satisfied are you with the resolution of the problem so far?" Both items used 5-point rating scales (1 = *not at all*, 5 = *completely*) and were integrated into one index (r = .79).

Intervention (T1). Next, couples were randomly assigned to the experimental conditions. That is, both partners used mental contrasting or both partners used indulging. Both partners worked through the intervention separately on their own devices by following text-based instructions and entering their responses into designated fields. We adapted the instructions from previous mental contrasting research (Jöhnk et al., 2025; Oettingen & Sevincer, 2018). In the mental contrasting condition, we first asked participants to identify the most positive aspect associated with resolving the problem. The instruction was, "Imagine you and your partner would resolve this problem. What would be the best thing, the most positive aspect if you and your partner had resolved this problem? How would resolving this problem make you feel?" Afterwards, they elaborated on this most positive aspect ("Now imagine this most positive aspect. Imagine it as fully as you can. Take your time"). To ensure participants engaged with the task at least minimally, they were required to stay on the page for at least 30 seconds. Then, we asked participants to identify the main inner obstacle that prevents them from resolving the problem ("Now - what is it within you that holds you back from resolving this problem with your partner? What is it in you that stops you from resolving it? What is your main inner obstacle?"). Afterwards, they elaborated on this main inner obstacle ("Now imagine your main inner obstacle occurring. Imagine it as fully as you can. Take your time"). Again, participants had to stay on this imagery task for at least 30 s. Example responses can be found in the Supplemental Material.

The indulging condition was similar to the mental contrasting condition. We also asked partners to identify the most positive aspect associated with resolving their problem at the beginning and then asked them to elaborate on this aspect. Contrary to the mental contrasting condition, we then asked them to identify and elaborate on a second positive aspect associated with resolving the problem instead of the main inner obstacle.

Problem-solving discussion (T1). After the intervention, the experimenter invited both partners back into the same room in front of one and the same screen in their apartment. Immediately, we gave the instruction, "Please discuss your problem in the next 10 minutes. Find a solution together." Then, the experimenter muted themselves, turned off their camera, and started recording. After 8 min, the experimenter told the couples how much time they had left. Otherwise, the experimenter unmuted themselves only to ensure sufficient video or audio quality and to remind the couples to come to an end at 10 min. We allowed all couples to finish their conversation, even if they exceeded the 10 min, and stopped the recording as soon as the couples indicated that they were finished. The average discussion time was 8 min 55 s (SD = 2 min 27 s), and the longest discussion lasted for 14 min 7 s. Discussion times did not differ between conditions (t [103] = −1.38,

p = .168). The session ended with a standardized closing slide: "Thank you for your participation. Please use the next 2 weeks to work on your selected problem."

Behavioral coding. Two trained[1] research assistants coded the verbal behavior of each partner shown during the problem-solving discussion. We used the software Mangold Interact (Mangold, 2020). For each video, one of the research assistants—blind to condition and hypotheses—first cut the videos into sequences, then determined the speaker (man or woman), and lastly assigned a corresponding behavioral code to each sequence. A sequence reflected the smallest behavioral unit that could be regarded as an entire thought. Thus, even incomplete sentences like "I agree" and one-word utterances like "no" or "why?" can reflect a sequence. We assigned speaker and behavioral codes in an exhaustive (i.e., all video sequences are coded) and mutually exclusive (i.e., each sequence can only receive one behavioral code) manner (Bakeman & Quera, 2011). In total, we coded 11,891 behavioral sequences, with M = 113 (SD = 43) sequences per couple.

We used the Interactional Coding System (ICS; Hahlweg, 2004), which was developed to observe couples' behavior during problem-solving discussions. The ICS allows differentiating between couples skilled at problem-solving and couples struggling with problem-solving, while also being able to detect changes in couples' problem-solving behavior after an intervention (e.g., Kaiser et al., 1998). We will only describe verbal ICS codes relevant to our dependent variables of this research: self-disclosure and solution suggestions.

Self-disclosure. *Self-disclosure* contains three subcategories (Hahlweg, 2004): (1) expression of feelings, (2) expression of attitudes and behavior, and (3) expression of wishes and needs. *Expression of feelings* refers to expressing mental or physical states (e.g., "I was really angry") and might also include concrete triggers (e.g., "When you slam the door, I get really scared"). *Expression of attitudes and behavior* refers to clarifying "why" the speaker has a certain attitude, opinion, or why they show a certain behavior (e.g., "I like our movie night, because they allow us to unwind"). *Expression of wishes and needs* refers to expressing a want or wish for something for the present or the future (e.g., "I would like to go on a vacation").

Solution suggestion. *Solution suggestion* (originally called positive solution, see Hahlweg, 2004) contains two subcategories: (1) specific, constructive proposal and (2) compromise suggestion. *Specific constructive proposal* refers to expressing ideas and propositions that constructively contribute to improving a situation or help avoiding negative situations in the present or future (e.g., "Let us keep a list of our finances in the future"). *Compromise suggestions* differ from specific constructive proposals by specifically incorporating the partner into the solution (e.g., "If you cook dinner, I will do the dishes").

Following the recommendation by Bakeman and colleagues (2005), the second rater coded a subset of 20 % of the videos and we determined inter-rater reliability based on this subset. Cohen's κ was .73. For data analysis we used the *rate* of a behavior (i.e., frequency per specified amount of time) to take varying discussion times into account (Bakeman &

Quera, 2011). Specifically, we divided the raw frequency by the discussion time in minutes, multiplied by ten. A score of 5 in solution suggestions would then indicate five solution suggestions per 10 minutes.

Perceived problem resolution (T2). Two weeks after the discussion (T2), we sent couples a link to a second online questionnaire containing the follow-up assessment of perceived problem resolution. Each partner was instructed to fill out the questionnaire individually without their partner present. The follow-up questionnaire comprised the same two items assessing perceived problem resolution used at baseline. Again, both items showed robust convergence ($r = .78$). After completing the questionnaire, all participants were informed about the condition they were in and received a link to the https://woopmylife.org website that explains the mental contrasting research and its application in detail.

Data analysis

We are mainly interested in the effect of the experimental condition on couples' perceived problem resolution, self-disclosure, and solution suggestions (Hypotheses 1, 2, and 3). Before testing the effect of condition, we tested whether it is necessary to consider perceived importance and perceived solvability as moderator variables (exploratory analyses). A statistical framework that allows us to account for the dyadic nature of our data and to model the interdependence between partners' externally coded behaviors and responses, while also accounting for between-dyad moderation is an extension of the standard Actor-Partner Interdependence Model (APIM; Cook & Kenny, 2005): the Actor-Partner Interdependence Moderation Model (APIMoM; Garcia et al., 2015).

Garcia and colleagues (2015) recommend examining the role of moderation effects by systematically testing different degrees of model complexity that allow to evaluate whether moderation effects are robust and should be included in the model. For example, we examined whether problem resolution is predicted by condition (0 = indulging; 1 = mental contrasting), and whether this effect interacts with the actor's and partner's (grand-mean-centered) perceived importance and perceived solvability. The dyadic nature of the data provides interaction terms for actors and partners. In our example, there are four interaction terms, namely, for each actor (condition × importance and condition × solvability) and partner (condition × importance and condition × solvability) of the couple. First, we tested whether the effect of condition and the effect of the interaction terms on the outcome varies across genders. Specifically, we constrained the effect parameters to be equal across genders and compared models with a χ^2 difference test. We treated the effects to be equal across genders when the difference was statistically not significant ($p > .20$; Kenny & Ledermann, 2010).

Second, we examined a model that included all interaction terms (i.e., the unrestricted model). Third, we tested whether assuming moderation is necessary by constraining all interaction terms' effects to be zero. Again, using χ^2 difference tests, we accepted the parsimonious model (i.e., no interaction effects) when there was no robust difference between the unrestricted and parsimonious model.

If we must assume moderation, we then constrained only the partner interactions (e.g., condition × men's importance predicting women's problem resolution) to be zero. Again, using χ^2 difference tests, we accepted the parsimonious model (i.e., no partner interaction effects) when there was no robust difference between the models. Additionally, we evaluated the sampling-error-adjusted Bayesian information criterion (SABIC) as a relative model fit index because it allowed fine-grained analyses of fit that go beyond the criterion of sample-size sensitive χ^2 tests.

We report and interpret findings for the most parsimonious model that we chose for each dependent variable. We provide an overview of all model fit coefficients in the Supplemental Material. We conducted the analyses using the R package lavaan (Rosseel, 2012). We aimed to collect a sample size sufficient for APIM analyses (100 couples; Ledermann & Kenny, 2017).

Results

Descriptive statistics

Table 1 provides the descriptive statistics for all baseline and dependent variables, separately for women and men. On average, participants selected problems that were highly important to them ($M = 5.91$, $SD = 1.09$; 7-point scale), with a moderate to high perceived solvability ($M = 4.78$, $SD = 1.39$; 7-point scale). At baseline, these problems were neither unresolved nor resolved ($M = 3.09$, $SD = 0.92$, 5-point scale). Compared to men, women perceived the problems as more important ($d = 0.48$), less solvable ($d = -0.32$), and less resolved at baseline ($d = -0.36$; Table 1).

Table 1. Descriptive statistics of the study variables, partner similarity (r), and standardized mean differences (Cohen's d).

	$M_{W/M}$	$SD_{W/M}$	*r*	*d*
Baseline variables				
Importance	6.17/5.66	0.90/1.21	.19	0.48
Solvability	4.56/5.00	1.39/1.36	.24	−0.32
Problem resolution	2.92/3.25	0.94/0.86	.33	−0.36
Dependent variables				
Problem resolution Δ	0.67/0.64	1.09/0.87	.12	0.03
Self-disclosure	8.80/6.82	5.39/3.94	.13	0.42
of Feelings	1.54/0.85	1.90/1.11	.28	0.45
of Attitudes/behavior	5.10/4.70	3.66/3.62	.14	0.11
of Wishes/needs	2.14/1.27	2.10/1.43	.28	0.49
Solution suggestions	4.12/3.69	2.89/2.82	.20	0.15

Note. $N = 105$ couples. W = women; M = men; *d* = difference between women and men. Importance and solvability used 7-point scales, and problem resolution used a 5-point scale. Change in problem resolution from T1 to T2 (Δ) can take values from −4 to 4. Self-disclosure and solution suggestions are indicated in frequency per 10 min.

To test for baseline differences between the two conditions, we conducted *t*-tests. Perceptions of importance and solvability, problem resolution at baseline, and relationship satisfaction did not differ between conditions (*t*s [208] < 1.52, *p*s ≥ .131). Additionally, the couples did not differ between conditions in terms of having children or cohabitation status (*t*s [103] < 0.32, *p*s ≥ .75). However, couples were together longer in the indulging condition ($M = 4.08$, $SD = 4.39$ years) than in the mental contrasting condition ($M = 2.98$, $SD = 2.74$ years). Although the difference was statistically significant (t [208] = 2.19, p = .030), the effect size is small (d = 0.30).

Some findings regarding the dependent variables should be highlighted. In both conditions, both women and men improved their degree of problem resolution (M_{change} = 0.66, SD_{change} = 0.98). Additionally, women showed more self-disclosure than men (d = 0.42) and suggested slightly more solutions than men (d = 0.15). Overall, we found positive correlations (i.e., interdependence) between partners' scores. Such interdependence necessitates an APIM framework (Cook & Kenny, 2005).

Actor-partner interdependence moderation model hypotheses testing

Next, we tested our hypotheses using the APIMoM (Garcia et al., 2015). To identify the most parsimonious model for each dependent variable, we tested whether effects vary across genders, and whether we must assume actor and partner moderation (i.e., condition × importance and condition × solvability). Table 2 displays the detailed results and effect parameters for all dependent variables within the most parsimonious model. For all dependent variables, condition did not interact with the partner's importance and solvability (*p*s ≥ .389; detailed model fit parameters are in the Supplemental Material). Thus, for all dependent variables, we only report potential gender differences and potential actor moderation before addressing our hypotheses.

Problem resolution (H1). The effects on perceived T2 problem resolution did not differ between women and men (χ^2 [5] = 5.856, p = .321). There was a significant interaction between condition and actors' importance for both women and men. Mental contrasting (vs. indulging) led to higher T2 problem resolution the higher the actors' importance of resolving the problem (b = 0.194, SE = 0.083, p = .02; see Figure 1).

We then probed this interaction. Mental contrasting (vs. indulging) significantly improved T2 problem resolution at very high importance (+1 *SD*; b = 0.358, SE = 0.147, p = .008). At high importance (*M*; b = 0.148, SE = 0.11, p = .09) and medium importance (−1 *SD*; b = −0.063, SE = 0.139, p = .325), this effect was not statistically significant.

Self-disclosure (H2). The effects on self-disclosure differed between women and men (χ^2 [5] = 8.593, p = .126). There was no significant condition × importance interaction *and* no condition × solvability interaction, χ^2 [8] = 3.626, p = .889). Thus, we report only the main effect of condition, separately for women and men (Figure 2). As expected, mental contrasting (vs. indulging) made men show more self-disclosure (b = 1.593, SE = 0.755, p = .018). Unexpectedly, we did not find this effect for women (b = −1.141, SE = 1.044 p = .274).

Table 2. Unstandardized effect parameters from APIMoM analyses.

		Self-disclosure		Solution suggestions	
	T2 problem resolution[a]	Women	Men	Women	Men
Actor effects					
Condition (C)	0.148	−1.141	1.593*	−1.109*	−0.445
Importance (I)	−0.186**	0.628	0.226	−1.386**	0.190
Solvability (S)	0.195**	0.075	−0.121	−0.177	0.109
C x I	0.194*	–	–	1.825**	−0.388
C x S	−0.128	–	–	0.254	0.253
Partner effects					
$I_{partner}$	−0.097*	−0.629	0.435	−0.135	−0.265
$S_{partner}$	−0.011	0.096	−0.172	−0.475*	0.160
C x $I_{partner}$	–	–	–	–	–
C x $S_{partner}$	–	–	–	–	–

Note. N = 105 couples. Dash = effect not included in the most parsimonious model.
[a]Effects did not differ between women and men.
**p < .01. *p < .05. Two-tailed.

Exploratively, we investigated the subcategories of self-disclosure. The effect of mental contrasting (vs. indulging) on self-disclosure in men remains significant in expressions of feelings (b = 0.467, SE = 0.209, p = .013), expressions of attitudes and behavior (b = 1.377, SE = 0.697, p = .024), but not in expressions of wishes and needs (b = −0.251, SE = 0.259, p = .332). Women were unaffected by condition in all subcategories of self-disclosure (ps > .148).

Solution suggestions (H3). The effects on solution suggestions differed between women and men. There was a significant interaction between condition and the actor's importance for women. Mental contrasting (vs. indulging) women suggested more solutions the more important they perceived the problem (b = 1.825, SE = 0.562, p = .001; Figure 3).

We then probed this interaction. That is, for women, we tested the effect of mental contrasting on solution suggestions at different importance levels. Against our expectations, mental contrasting (vs. indulging) made women suggest fewer solutions at medium importance (−1 SD; b = −3.10, SE = 0.92, p = .001) and high importance (M; b = −1.11, SE = 0.54, p = .041). Also, against our expectations, at very high importance (max), the conditions did not differ (b = 0.87, SE = 0.70, p = .213). There was no condition × importance interaction *and* no condition × solvability interaction for men (ps ≥ 0.379). Against our expectations, mental contrasting did not make men suggest more solutions (b = −0.453, SE = 0.563, p = .421).

Discussion

This study investigated how inducing mental contrasting to both partners of romantic couples affects their problem-solving. We collected dyadic data and used the APIM to model the

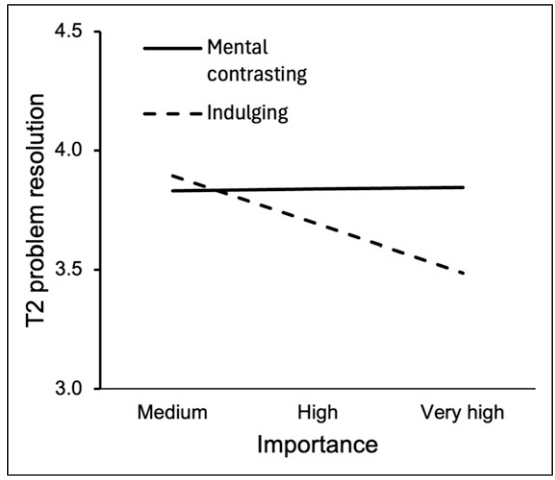

Figure 1. Effect of mental contrasting on problem resolution at different importance levels. *Note.* T2 problem resolution ranges from 1 (*not at all resolved*) to 5 (*fully resolved*). We controlled for T1 problem resolution by including it as a covariate.

complexity of couple relationships. Importantly, mental contrasting led to higher perceived problem resolution after 2 weeks when resolving the problem was of the highest importance to the partners. To better understand how mental contrasting may have improved problem resolution, we asked the couples to discuss their problem and observed their behavior during that discussion. Men in the mental contrasting condition showed more self-disclosure during the problem-solving discussion compared to men in the indulging condition, particularly in terms of expressing feelings, attitudes, and behaviors. Women in the mental contrasting condition suggested fewer solutions than those in the indulging condition, especially for problems of medium to high importance. Thus, mental contrasting appears to be useful in problem-solving as it enables men to articulate their feelings, attitudes, and behaviors, makes women more selective about their solution suggestions, and enables both women and men to effectively implement solution strategies.

Perceived problem resolution

When resolving the problem was of highest importance to participants in the mental contrasting condition, they reported higher perceived problem resolution 2 weeks later, compared to those in the indulging condition. This finding is in line with Fantasy Realization Theory (Oettingen, 2000, 2012), which postulates that mental contrasting allows finding effective ways of dealing with one's inner obstacle, when the wish is highly important. That is, mental contrasting makes people identify strategies and commit to these strategies according to the perceived surmountability of the obstacle. When obstacles were surmountable, partners may have found ways to overcome these obstacles; when the obstacles were insurmountable, partners might have been enabled to accept the

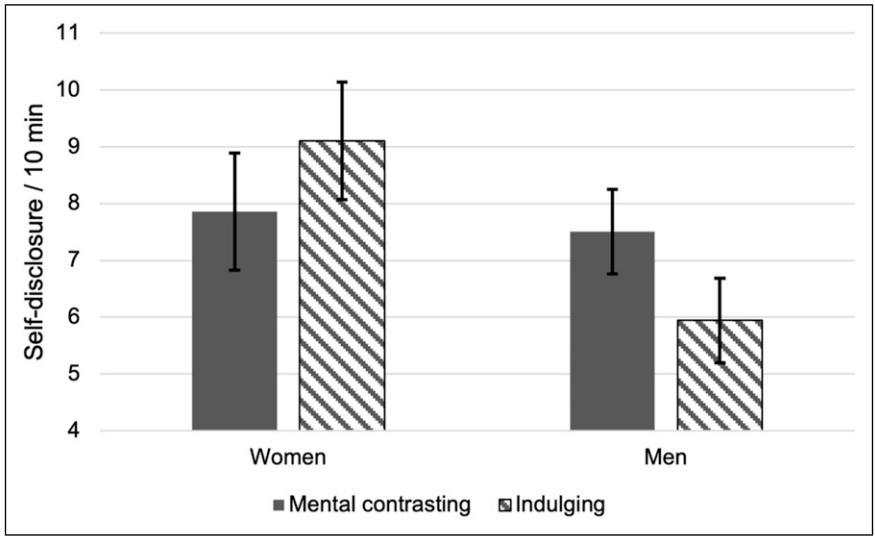

Figure 2. Effect of mental contrasting on self-disclosure. *Note.* Error bars = standard errors.

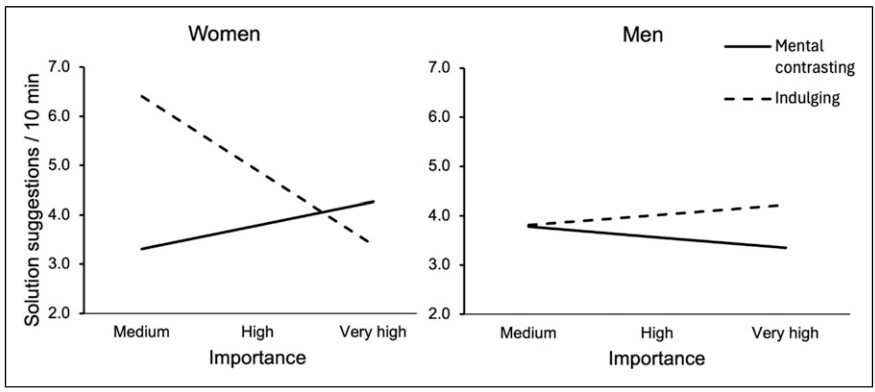

Figure 3. Effect of mental contrasting on solution suggestions at different importance levels.

potentially irresolvable nature of the problem and were less frustrated. Furthermore, indulging in the desired future appears to be less effective the more important the problem is (Figure 1). This finding is in line with previous studies showing that indulging in positive fantasies makes people passively hope for better times, thereby sapping the energy required for actual change and deeming challenging problems as too demanding (Kappes et al., 2013; Kappes & Oettingen, 2011; Oettingen et al., 2001).

Self-disclosure

When observing couples' problem-solving discussion, we focused on two key behaviors highly relevant for relationship problem-solving: Self-disclosure and solution suggestions. Men in the mental contrasting condition exhibited more self-disclosure than those in the indulging condition, making the self-disclosure rate similar to the self-disclosure rate women exhibited (Figure 2). The heightened self-disclosure in men is notable, as men generally disclose less than women—a pattern that continues to be supported in recent research (e.g., Horne & Johnson, 2018; Yu, 2014), although there are indications that gender differences in self-disclosure vary by topic, recipient, and communication medium (e.g., Greene et al., 2006; Sheldon, 2013). This heightened self-disclosure among men may facilitate mutual understanding within the couple.

Our exploratory analysis revealed that the effect on self-disclosure was primarily driven by men expressing feelings, attitudes, and behaviors more often, but not by men expressing wishes and needs more often. By confronting and articulating their emotional barriers, men should become more engaged in the problem-solving process. This higher engagement could contribute to more effective resolution by aiding in recognizing and identifying the underlying sources of the problem (Baker & McNulty, 2020). Furthermore, as men expressed their attitudes (i.e., why they feel or behave in a certain way), they might have allowed their partner to understand the problem and thus be more sensitive about their approach to resolving the problem. The current sample size lacks sufficient power to investigate such mediation effects, specifically to examine by which problem-solving behaviors mental contrasting influences problem resolution. This then could be a topic for future research. Lastly, the even distribution in self-disclosure between women and men in the mental contrasting condition might indicate that mental contrasting makes partners evenly engaged in the problem-solving process instead of having one partner dominating the discussion.

Solution suggestions

Women in the mental contrasting condition suggested fewer solutions than those in the indulging condition, particularly for problems perceived as moderately to highly important. This finding was unexpected, as we initially hypothesized that mental contrasting would lead to a greater number of solution suggestions. Instead, it seems that mental contrasting made women more selective and targeted about their solution suggestions, refraining from light-heartedly proposing ineffective solutions. Afterall, although women in the mental contrasting condition suggested fewer solutions for problems of medium and high importance, problem resolution did not differ between conditions, suggesting that the additional solutions that the women in the indulging condition generated did not measurably translate into better problem resolution and thus may not have been effective. Furthermore, lag-sequential analysis (Bakeman & Quera, 2011) revealed that only in the mental contrasting condition were participants more likely to suggest a solution immediately *after* they themselves had self-disclosed (for mental contrasting, $z = 2.08$, $p = .037$; for indulging, $z = -0.70$, $p = .484$). This pattern may indicate that solutions

suggested in the mental contrasting (vs. indulging) condition are more substantiated because they are more strongly tied to self-disclosure content. However, this finding may also indicate that both approaches (i.e., being more selective after mental contrasting and suggesting many solutions after indulging) might benefit problem-solving.

Limitations and future research

Some limitations of the present study should be addressed in future research. First, our sample comprised predominantly young, educated, mixed-gender couples with high relationship satisfaction. They generated problems perceived as relatively solvable, which limits the generalizability of our findings. For example, in more established, less satisfied couples, a quick resolution might not be feasible. In these less satisfied couples, mental contrasting has instead been found to foster mental engagement with problems, signaling a strong commitment to resolve even more severe problems (Jöhnk et al., 2025). Future studies should include more diverse samples, including couples with children, couples with unsatisfied relationships or marriages, those from various cultural backgrounds, and different sexual orientations, as well as larger sample sizes. These approaches would enhance the understanding of mental contrasting across diverse contexts.

Second, our study focused on the frequency of certain behaviors without assessing their quality. Dimensions such as the breadth vs. depth of self-disclosure (Greene et al., 2006) and the quality of solution suggestions could provide deeper insight. Reliably evaluating the effectiveness of solution strategies is challenging (Anderson et al., 2009; Grover et al., 2024), as effectiveness assessments are typically conducted using standardized hypothetical scenarios or richly described real-life problems (e.g., diaries), where solutions can be meaningfully compared. In our study, each couple discussed a unique relationship problem, with limited contextual information available to the researchers, which makes evaluating solution quality difficult. Future studies may employ more standardized tasks to enable more objective comparisons. Additionally, while we focused on speaker behaviors, we did not examine listener responses, such as expressions of acceptance versus criticism (Hahlweg & Kaiser, 2018). Future research should analyze behavioral sequences to provide a more comprehensive understanding of how mental contrasting affects problem-solving dynamics.

Third, while we experimentally induced mental contrasting, people also vary in the mode of thought they spontaneously engage in. This spontaneously used mode of thought should be associated with problem-solving behavior. For instance, people who tend to spontaneously use mental contrasting, compared to other modes of thought, have more compassion, take on more responsibility, engage in higher promotion focus, have more working memory capacity, and report better self-regulation (Sevincer et al., 2017, 2020; Sevincer et al., 2024; Tamim et al., 2022, 2024). Thus, future research should investigate to what extent spontaneous mental contrasting is associated with problem-solving and how this potentially bi-directional relationship unfolds over time. That is, spontaneous mental contrasting may improve problem-solving, but successful (or poor) problem-solving might also make people use mental contrasting more (or less) often. Furthermore, other characteristics relevant to problem-solving (e.g., compassion, perspective-taking,

and self-regulation) might moderate the effectiveness of mental contrasting. For instance, people reporting lower in self-regulation, who are less likely to engage in mental contrasting spontaneously, might especially benefit from a mental contrasting intervention.

Fourth, given that indulging is the most common mode of thought, we focused exclusively on comparing mental contrasting with indulging. While this allowed us to maximize statistical power for this key comparison, it limits the generalizability of our findings to other modes of thought. Future studies should include dwelling and reverse contrasting in addition to mental contrasting and indulging to provide a broader perspective.

Fifth, although the observational task used in this study is based on established procedures (e.g., Gottman, 1979; Heyman, 2001), our switch to Zoom represents a novel methodological approach. This format is both efficient and flexible, allowing couples to participate from home without traveling to a lab. Still, this format might affect how comfortable participants felt revealing personal information. Future research should investigate whether being at home creates more comfort than a lab setting, and whether the influence of being recorded via Zoom reduces participants' comfort and authenticity. Also, although nonverbal and paraverbal cues (e.g., facial expressions, touch, tone) play an important role in couple communication (e.g., Smith et al., 2011), our Zoom recordings did not consistently capture the detail needed to code these cues across all couples. We therefore restricted our coding to verbal behavior but note the inclusion of nonverbal and paraverbal cues as an important direction for future research. In addition, because our coding team consisted of only two coders, future studies might consider using a larger coding team to reduce the impact of potential idiosyncrasies of individual coders.

Conclusion

This study contributes to understanding how the self-regulation strategy of mental contrasting influences problem-solving in romantic relationships. Mental contrasting was particularly useful in enhancing self-disclosure in men and enabling both partners to find realistic ways for dealing with their individual obstacles in problem resolution. Ultimately, mental contrasting improved partners' perceived problem resolution for problems perceived of highest importance. Given its simplicity and ease of application, mental contrasting may be a valuable addition to couple counseling or self-help tools.

Consent to participate

All participants provided written consent to participate.

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Ethical considerations

This study was approved by the Local Ethics Committee of the Faculty for Psychology and Movement Science, University of Hamburg (approval number: 2023_002).

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Data Availability Statement

The research material, data files, and analysis code are available at https://osf.io/uq2rb/?view_only=2dcdfbc8ad4d4c3a836634680a741a0f. As the study data contains identifiable information (e.g., information about specific relationship problems, video- and audio files), only restricted data that could be fully anonymized is openly available.

Open research statement

As part of IARR's encouragement of open research practices, the authors have provided the following information: This research was pre-registered. The aspects of the research that were pre-registered were the study design, sample size, and the hypotheses. The registration was submitted to: https://www.aspredicted.org (#97074). The full data used in the research cannot be shared with any person because it contains sensitive information about the participants' relationships. However, restricted data files, without identifiable information, can be publicly shared and can be obtained at: https://osf.io/uq2rb/overview?view_only=6b5c75dc525449da9d105532e496de54 or by emailing: henrik.joehnk@zu.de. The materials used in the research can be publicly posted. The materials can be obtained using the link above or by emailing: henrik.joehnk@zu.de.

Supplemental material

Supplemental material for this article is available online.

Note

1. The coders practiced with the ICS (Hahlweg, 2004) for 40–60 hours using training videos and began coding the study material after reaching inter-rater reliability of $\kappa = .70$ with the training material.

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