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RUNNING HEAD: Co-rumination and moral repair

Let's talk about this:

Co-rumination and dyadic dynamics of moral repair following wrongdoing

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Abstract

Interpersonal transgressions threaten victims, offenders, and their relationship, often leading the parties to ruminate about the wrongdoing—not only individually, but also together, in acts of *co-rumination*. We investigate how two forms of co-rumination—co-reflection and co-brooding—influence, or are influenced by, individual rumination and victim forgiveness or offender self-forgiveness. Our study used a prospective-longitudinal-dyadic design ($N = 110$ dyads), where relationship couples were recruited prior to an incident and, once a partner reported feeling wronged by the other, completed repeated surveys over four time-points 24-48 hours apart. Cross-lagged panel models indicated that co-rumination was related to increased subsequent individual rumination; forgiveness and self-forgiveness were related to reduced subsequent co-rumination; and self-punitiveness showed positive feedback cycles with co-brooding and offender rumination, whereas genuine self-forgiveness seemed to draw on co-reflection via individual rumination and, in turn, reduced co-reflection. Co-rumination plays an important, yet complex, role within processes of moral repair.

Keywords: forgiveness; self-forgiveness; rumination; co-rumination; moral repair

Let's talk about this:

Co-rumination and dyadic dynamics of moral repair following wrongdoing

Transgressions are psychologically uncomfortable experiences. As victim, we may experience hurt and humiliation as a result of another's actions. As offender, we may feel guilt and grief as we grapple with our socially unacceptable behaviour. Both partners may be angry at each other. In addition, regardless of whether we are the victim or the offender, we are likely to be concerned about what the wrongdoing means for our relationship with the conflict partner. As a result, we tend to dwell upon the wrongdoing, repeatedly. We ruminate.

Rumination is regularly discussed as an adverse behaviour that prolongs negative emotions, thus diminishes our well-being (Nolen-Hoeksema, 1991) and our capacity to move on from an incident (McCullough et al., 1998). Hence, rumination is often seen as an obstacle to forgiveness and self-forgiveness (McCullough et al., 2007; Witvliet et al., 2011). Conversely, forgiveness and self-forgiveness may help individuals to reduce rumination (Ysseldyk et al., 2007) and, through this, promote well-being (Worthington et al., 2007; McCullough et al., 2007). While in causally opposite directions, both possibilities assume a negative relationship between (self-)forgiveness and rumination.

However, there is an alternative theoretical possibility. Rumination could have a positive relationship with (self-)forgiveness by allowing individuals to process the wrongdoing. Victims and offenders need to work through what went wrong to genuinely forgive the other or self (e.g., Wenzel et al., 2010). If individuals fail to work through the wrongdoing, this can result in pseudo-forms of forgiveness and self-forgiveness, where forgiveness is achieved by brushing aside any harm that was done, but without experiencing true conciliatory feelings and the benefits that forgiveness may proffer to the forgiver (Enright

& the Human Development Study Group, 1991; Hall & Fincham, 2005). Additionally, rumination may allow individuals to work through what has happened and come to a broader understanding of the transgression by considering different perspectives, and contextualizing the incident (Wenzel & Coughlin, 2020). In these ways, rumination may also potentially promote genuine forgiveness and self-forgiveness.

Critically, prior research conceives of rumination as an intrapersonal process. Yet, rumination can also be shared and interactive: *co-rumination* (see Rose, 2002). As forgiveness and self-forgiveness are dynamically interrelated in a dyadic process of moral repair (Wenzel et al., 2021), we need to gain a better understanding of the co-ruminative processes that occur following wrongdoing, in addition to victims' and offenders' own repetitive thinking.

The present research investigates the relationship between rumination and (self-)forgiveness. We assume this relationship is a dynamic one, in which rumination may influence, and be influenced by, (self-)forgiveness processes; and where rumination can occur at both intra- and interpersonal levels that also reciprocally affect each other. The present research therefore explores moral repair as a dynamic process, where individual rumination and co-rumination intertwine, and tie in with processes of (self-)forgiveness. Examining the role of (co-)rumination in this dynamic way allows us to seek deeper nuance in the process of moral repair than past research, potentially answering a number of open questions. For example, is co-rumination an outlet for the parties' individual ruminations, or does co-rumination feed into and sustain individuals' own rumination about the wrongdoing? Is co-rumination an antecedent or consequence of forgiveness and self-forgiveness, or both? If antecedent, is co-rumination beneficial or detrimental to forgiveness and self-forgiveness? And is this so independent of, or via, individual rumination?

Rumination and Co-Rumination following Wrongdoing

Rumination can be broadly defined as “as repetitive thinking about negative personal concerns and/or about the implications, causes, and meanings of a negative mood” (Whitmer & Gotlib, 2013; p. 1036). In the present context, the negative personal concerns refer to a transgression that has occurred between two individuals. Both victims and offenders can engage in rumination about a wrongdoing (e.g., Evans et al., 2007; Orth et al., 2008), whether as intrusive thoughts that occur repeatedly without intention, or deliberate thoughts of recalling and reflecting on the incident (Cann et al., 2011).

However, rumination is not necessarily a solitary activity. Individuals can share their thoughts and engage in repeated thinking about an issue together with another person, usually a close other. Such co-rumination has mainly either been studied as a form of shared self-disclosure with a supporting third-party, peer or friend (Rose, Carlson, & Waller, 2007); or, in a relationship dyad, as the sharing of thoughts and feelings in response to a shared stressor or problem, such as one partner’s illness (Cornelius, 2021). However, co-rumination can also be less bi-partisan and involve adversarial roles, such as between two relationship partners about a wrongdoing that one committed against the other.

While co-rumination with peers has been found to indicate or foster positive friendship, research tends to highlight its draw-backs in terms of dwelling on and amplifying negative emotions, thus promoting anxiety and depression (Rose, 2002; Rose et al., 2007), or contributing to stress contagion between partners (Cornelius, 2021). However, different forms of co-rumination may need to be distinguished; specifically, “co-brooding” as distinct from “co-reflection” (Bastin et al., 2014) or “co-reappraisal” (Horn & Maercker, 2016). *Co-brooding* can be defined as the repetitive voicing of negative thoughts and feelings, unresponsive to the other’s utterances and unconstructive. It manifests in two parties repeatedly telling each other the same issues, ‘going around in circles’. In contrast, *co-*

reflection (or *co-reappraisal*) describes interactions in which two parties share their thoughts in order to clarify one another's understanding of an incident, re-appraise the way in which they think about it, and find meaning (Horn & Maercker, 2016).

While co-rumination is interpersonal and interactive compared to intrapersonal individual rumination, research has so far not investigated in what way the two may be linked. First, it is possible that co-rumination might simply articulate individuals' private thinking; hence individual rumination may increase co-brooding and/or co-reflection. Second, it is possible that co-rumination provides material—new content deriving from the exchange with the other person—for individuals to ruminate on; that is, co-brooding and/or co-reflection may increase individual rumination. The causal relation between rumination and co-rumination, if any, is a first fundamental question to address in order to understand their respective roles in the moral repair process, in forgiveness and self-forgiveness.

Forgiveness and Self-Forgiveness following Interpersonal Conflict

Forgiveness is commonly conceived as a transformation of motives toward the offender, from becoming less hostile and less avoidant to becoming more benevolent (McCullough et al. 1997; McCullough et al., 2006), but measurable on a single dimension from malevolent to benevolent (Forster et al., 2019). For self-forgiveness, multiple dimensions need to be distinguished, not all of which are conducive to conciliatory outcomes (Woodyatt & Wenzel, 2013). For *genuine self-forgiveness*, negative feelings of guilt, regret, and shame “must be fully experienced” (Hall & Fincham, 2005, p.627); offenders take responsibility for the wrongdoing and work through their guilt, thereby restoring a positive moral self (Wenzel et al., 2012). However, taking responsibility and experiencing aversive feelings like guilt can also be part of self-condemning responses, which, in the form of persistent *self-punitiveness*, is antithetical to self-forgiveness. This distinction maps onto a dual-process model of self-forgiveness in terms of (a) working through the wrongdoing and

re-affirming violated values and (b) releasing oneself of negative feelings to self and restoring self-regard (Griffin et al., 2015, 2018).

The Relationships between (Co-)Rumination and (Self-)Forgiveness

In the aftermath of a transgression, individuals may engage in ruminative thinking, individually by themselves and/or together with the partner. For rumination and co-rumination, similar arguments can be made about their implications for forgiveness and self-forgiveness. The specific nature of these relationships is yet unclear in the research literature; however, we identify three potential patterns derived from forgiveness theory.

First, when dwelling on the events and their negative impact on self and one's relationship, the transgression is experienced as though it is actually re-occurring (Miller et al., 2003), preoccupying oneself with the past and the pain, and reducing the ability to process the transgression in a forward-thinking manner (McCullough et al., 2007). Accordingly, increased rumination has been associated with increased vengeful thinking and avoidance for victims, hence reduced forgiveness (McCullough et al., 1998; McCullough et al., 2007). For self-forgiveness, although less research has been conducted on this issue (see Graham et al., 2017), there is likewise indication that rumination decreases self-forgiveness (Witvliet et al., 2011). For co-rumination, similar arguments can be made. However, when differentiating between co-brooding and co-reflection, one could expect that particularly co-brooding would prevent forward-thinking processing and reinforce negative affect, thus impeding forgiveness and genuine self-forgiveness, and increasing self-punitiveness.

It is also theoretically conceivable that the negative relationship between rumination and forgiveness is in the causally opposite direction; that is, forgiveness might reduce rumination. Forgiveness is indicated by a reduction in negative thoughts and emotions associated with a wrongdoing, and through this, is broadly linked to improvements in psychological and physical wellbeing (Worthington et al., 2007). Indeed, McCullough and

colleagues (2007) found evidence that unforgiveness might precede rumination, even though the authors suggested that there was more evidence for the reverse causality. Similarly, it has been argued that self-forgiveness can break an offender's adverse rumination cycle (Graham et al., 2017); and there is evidence that self-compassion interventions—one way to release self-condemnation (Woodyatt et al., 2017)—can reduce rumination (Ferrari et al., 2019).

While rumination is commonly considered to be an impediment to forgiveness and self-forgiveness, it is necessary to reflect upon the wrongdoing and its implications to genuinely forgive oneself (Fisher & Exline, 2010) or another person for doing wrong: “forgiveness involves constructive psychological change” (McCullough et al., 2003, p. 553). Victims and offenders must cognitively engage with the wrongdoing in order to work through it and then move on from it. Thinking about it increasingly abstractly, through the lens of their broader relationships and valued identities, would allow individuals to contextualize the incident, prevent it from becoming a defining moment of self and relationship, and focus on lessons learned and how to improve in the future (Wenzel & Coughlin, 2020). Hence, rumination may facilitate forgiveness and self-forgiveness (Wenzel et al., 2010). The same argument could hold for co-rumination, specifically co-reflection, which involves a joint working through the wrongdoing toward a shared understanding and meaning-making; co-reflection should facilitate genuine forgiveness and self-forgiveness. In contrast, co-brooding could contribute to both parties being stuck in negativity, with victims being vengeful, avoidant, and unforgiving, and offenders being self-punitive.

Finally, for all three theoretical possibilities—co-brooding reducing (self-)forgiveness, (self-)forgiveness reducing any co-rumination, and co-reflection increasing (self-)forgiveness—it is possible that these operate through individual rumination or, alternatively, mediate the effects of individual rumination.

The Present Study

In the present study, we tested these theoretical possibilities in a *prospective-longitudinal dyadic* design, over four time-points with the dyad as unit of analysis. We modelled co-reflection and co-brooding as latent variables with both victim and offender variables as indicators, for a truly dyadic construct. We then used a series of cross-lagged panel models to test the lagged relationships between rumination, co-rumination, forgiveness, and self-forgiveness variables. In cross-lagged panel analysis, variables at one time-point are regressed onto themselves (autoregressive effect) and the other variables at the preceding time-point (lagged effects). With requisite caution due to model assumptions and potential confounding third variables, a significant lagged effect offers indication that the temporally preceding variable directionally influences the later variable or, where both variables have lagged effects, that they reciprocally influence each other (see Selig & Little, 2012). While recent advances in cross-lagged panel analyses offer further sophistication by isolating intraindividual change from interpersonal difference over time, it depends on theoretical reasons whether such a focus on intraindividual fluctuation is appropriate (Orth et al., 2020). In our case, we saw no argument for ignoring between-person difference, as it is entirely plausible (and consistent with theoretical arguments) that, for example, individuals who ruminate more *than others* will subsequently be less forgiving *than others*. We therefore used a standard cross-lagged panel model. The data of this study are available at the Open Science Framework at <https://osf.io/9pfd4/>.

Method

Procedure

Interested couples were invited to participate in the study before the critical event. The partners were required to independently confirm their consent to participate in the study. Each partner was instructed to be aware of any wrongdoing the other committed against them,

including “an act of disrespect, a trust violation, an indiscretion, psychological hurt, physical harm, and so on.” When one relationship partner felt wronged by the other, the wronged person (victim) completed an initial questionnaire within 24 hours, briefly describing the event. This brief survey triggered an email to both parties, asking them to complete an online survey within 24 hours. The completion of that first survey then triggered another email, with a 24-hour delay, which instructed participants to access the next online survey and complete it within the next 24 hours (i.e., up to 48 hours after completion of the first survey). This process was repeated for a third and fourth survey. Thus, the study comprised four measurement points with 24- to 48-hr intervals (for a similar design, see Wenzel et al., 2021).

Participants

We recruited university students and their relationship partners for this study. Given the novelty of the research and the unavailability of any effect size expectations, we conducted the study in two stages. We used data from an initial sample of 83 dyads with complete data and tested the general model. Based on the model estimates, we conducted a Monte Carlo simulation in MPlus to determine the sample size needed to detect a cross-lagged effect with a power of 0.8 and a standardised regression weight greater than 0.1 (i.e., a small effect, $d = \sim 0.2$). The analyses indicated that a sample size of $N = 110$ dyads would be sufficient. While it is normally advised that power determination not occur on the basis of the observed effect sizes of the same study (Gelman, 2019), given the complexity and resource-intensity of the data collection, we decided this approach was an appropriate compromise (Wenzel et al., 2021). We collected further data until we obtained 110 complete dyads with data across all four timepoints. Of these, 99 were different-sex and 9 same-sex (7 female, 2 male) relationships, and another two couples indicated their gender as non-binary. Participants' average age was 23.5 years. Of the 99 different-sex relationships, 70 (71%) of the female partners and 29 (29%) of the male partners were in the victim role.

Measures

The surveys that each of the participants completed contained a larger battery of questions for other purposes, outside the focus of the present paper (see [OSF link]). Here, we only detail the measures relevant for the present investigation. Except for the description and classification of the incident and the measure of severity, which were only assessed once within both parties' initial questionnaires, the main variables were repeated at each measurement point. The measures varied depending on the victim or offender role that participants assumed in the situation. All items were rated using 7-point response options from 1 = *strongly disagree* to 7 = *strongly agree*. For multi-item scales, scores were computed by averaging item responses.

Co-reflection. Co-reflection represents both parties' engagement in joint discussion and efforts at processing the incident towards gaining understanding, insights, and meaning. Both victims and offenders rated their co-reflection on two items adapted from Horn and Maercker (2016): "I talk and listen to my partner about the incident to see things in a different light" (Item 1), and "I talk to my partner about the incident to get a new perspective on things" (Item 2). The two items were highly correlated for victims ($r_s = .76, .91, .87, \text{ and } .95$, at Times 1 to 4, respectively) and for offenders ($r_s = .77, .90, .90, \text{ and } .90$). The joint assessments by victim and offender showed good estimated internal consistency across the four items ($\alpha = .79, .82, .80, \text{ and } .83$).

Co-brooding. Co-brooding is the parties' repetitive and unresponsive re-telling to each of their perceptions of the incident. Both victims and offenders rated their co-brooding on two items adapted from Horn and Maercker (2016) but modified so that the items were not confounded with negative mood and negative evaluation. Instead, the item emphasis was on the repetitiveness and unresponsiveness: "Regarding the incident, my partner and I tell each other the same things over and over again" (Item 1), and "My partner and I get stuck talking

about the issue and circle around what happened” (Item 2). The two items were highly correlated for victims ($r_s = .61, .84, .81, \text{ and } .89$, at Times 1 to 4, respectively) and for offenders ($r_s = .67, .72, .70, \text{ and } .79$). The joint assessments by victim and offender showed good estimated internal consistency across the four items ($\alpha = .75, .78, .79, \text{ and } .83$).

Individual rumination of victims and offenders. Individual rumination was measured with the item: “How much have you been thinking about the transgression?” (within the last 24 hrs; Wenzel & Coughlin, 2020).¹

Forgiveness. As a measure of forgiveness, victims completed the 18-item Transgression-Related Interpersonal Motivation scale (TRIM-18 scale; McCullough et al., 2006). The scale contains 5 items assessing revenge (e.g., “I’ll make him/her pay”), 7 avoidance-related items (e.g., “I’m trying to keep as much distance between us as possible”), and 6 benevolence-related items (e.g., “Although his/her actions hurt me, I have goodwill for him/her”). Forster et al. (2019) concluded that forgiveness measured by the TRIM-18 is adequately represented as a single dimension. In the present study, after reverse-scoring revenge and avoidance items, all items were averaged into a composite scale score ($\alpha = .90, .93, .93 \text{ and } .93$, at Times 1 to 4).

Self-forgiveness. The offenders’ self-forgiveness was measured in terms of two processes (see Griffin et al., 2015): self-punitiveness (or lack thereof), and genuine self-forgiveness via working through one’s wrongdoing and guilt. The measures were taken from the Differentiated Process Scale of Self-Forgiveness (Woodyatt & Wenzel, 2013a), which measures *self-punitiveness* with 7 items such as “I deserve to suffer for what I have done”, and *genuine self-forgiveness* also with 7 items, including “I have spent time working through my guilt.” Estimated internal consistency was high for both self-punitiveness ($\alpha = .84, .88, .89, \text{ and } .92$, at Times 1 to 4, respectively) and genuine self-forgiveness ($\alpha = .85, .86, .89, \text{ and } .88$). Self-punitiveness and genuine self-forgiveness were positively correlated at all four

time-points ($r_s = .50, .44, .44, \text{ and } .41$). The positive correlations reflect that both responses involve taking responsibility and accepting guilt, but they are opposite facets of self-forgiveness.

Seriousness. Both parties rated the seriousness of the wrongdoing via an equivalent 3-item scale: “What do you currently think about the incident? My partner’s [for offenders: My] behaviour was...wrong; serious; inexcusable” (victims: $\alpha = .68$. offenders: $\alpha = .66$).

Results

Diverse relationship transgressions were reported. According to victims’ own classifications (multiple responses possible), 66.4 % were acts of disrespect, 35.5% neglect or rejection, 24.5 betrayal of trust, 10.9% insults or verbal abuse, 10.0% wrongful accusations, 9.1% deceit, secrecy or lying, 4.5% involvement with another person, and 16.4% other. As shown in Table 1, victims rated the transgression as significantly more serious than offenders did, paired samples $t(109) = 5.11, p < .001$, even though both parties’ seriousness ratings were significantly correlated ($r = .19, p = .045$; see Table 2). Means and correlations for all variables are shown in Tables 1 and 2, respectively.

Co-Rumination as Latent Construct

Co-rumination refers to the two parties (victim and offender) engaging in exchange of thoughts and perceptions about the incident—we distinguish between a responsive and constructive exchange that advances shared insight (co-reflection) and an unresponsive and repetitive exchange of partial views (co-brooding). Being shared, both partners should be able to rate their engagement in these activities. We modelled co-reflection and co-brooding as latent constructs, using the victim and offender items as indicators and accounting for any possible biases or disagreements about their engagement in these activities as error variance. This makes co-rumination a truly dyadic construct. We initially tested the measurement models for each latent construct of co-rumination across the four time-points in the form of

autoregressive models, anticipating how these constructs would be subsequently incorporated into cross-lagged analyses to test the hypothesized relationships (see Figure 1).

In these and all following models, we included victim and offender-perceived seriousness of the wrongdoing at Time 1 as covariates. At each timepoint, the two victim ratings and the two offender ratings were treated as observed indicators of the latent constructs (co-reflection and co-brooding). We allowed the residuals of the two victim items to covary and the two offender items to covary, to account for possible perspective-specific differences in perceptions of the couple's engagement in co-reflection and co-brooding. We allowed the residuals of equivalent items for victims and offenders to covary at each timepoint to account for item-specific content across roles. Furthermore, the residuals of the four indicators were set to correlate from one timepoint to the next to account for indicator-specific variance across time (Cole & Maxwell, 2003). We constrained the factor loadings of each indicator to be equal across time, to ensure consistency of the measurement of the latent construct. For parsimony, we further constrained the autoregressive relationships of the latent construct to be equal across time. We assessed the fit of our models with three different fit indices: a χ^2/df ratio of 2 or less represents a good fit and between 2 and 3 an acceptable fit; a CFI of .95 or higher represents a good fit and between .90 to .95 a marginal fit; and an RMSEA of .06 or lower represents a good fit, between .06 to .08 an acceptable fit, and between .08 to .10 a marginal fit (Hair, Anderson, Babin, & Black, 2010; Tabachnick & Fidell, 2019).

The model for co-reflection yielded a marginal fit, $\chi^2(102) = 206.23, p < .001, \chi^2/df = 2.02$; CFI = .937; RMSEA = .097 [.078, .116]. Relaxing the equality constraints on factor loadings did not significantly increase model fit, $\Delta\chi^2(9) = 8.41, p = .493$; hence, the equality constraints were maintained. Similarly, relaxing the equality constraint on the stabilities for the latent construct did not increase model fit, $\Delta\chi^2(2) = 0.38, p = .825$, and they were

therefore maintained. Modification indices indicated no single adjustment that would have improved the model substantially. The standardized stability coefficients for latent co-reflection from one time-point to the next were .68-.84 (see Table 3, top panel).

The model for co-brooding yielded an acceptable to good fit, $\chi^2(102) = 156.08, p < .001, \chi^2/df = 1.53$; CFI = .956; RMSEA = .070 [.047, .091]. Relaxing the equality constraints on factor loadings did not significantly increase model fit, $\Delta\chi^2(9) = 10.58, p = .306$; neither did the relaxing of equality constraints on the stabilities for the latent construct, $\Delta\chi^2(2) = 3.41, p = .182$. Hence, the constraints were maintained. Modification indices signaled no meaningful adjustments. The standardized stability coefficients for latent co-brooding from one time-point to the next were .85-.90 (see Table 3, bottom panel).

Cross-Lagged Relationships between Individual Rumination and Co-Rumination

We next tested the cross-lagged relationships between individual rumination and co-rumination (see Table 4). To limit the complexity of these and all subsequent models, we tested them for latent co-reflection and co-brooding separately; we included two victim or offender variables as observed variables via scale averages (here, victim and offender rumination). Factor loadings for the latent constructs were constrained to be equal across time, as were stabilities and cross-lagged relationships (for the general model used for all tests of cross-lagged relations, see Figure 2).

For co-reflection, the model yielded a marginal fit, $\chi^2(250) = 463.07, p < .001, \chi^2/df = 1.85$; CFI = .908; RMSEA = .088 [.076, .101]. The equality constraints on stabilities and cross-lagged effects across time significantly diminished the fit of the model, $\Delta\chi^2(18) = 37.33, p = .005$. Two constraints needed to be relaxed, namely the stabilities of victim and offender rumination at Time 1-2, which were lower than for the following lags. The remaining equality constraints did not significantly diminish the fit, $\Delta\chi^2(16) = 16.25, p = .436$. The overall model fit slightly improved, $\chi^2(248) = 442.00, p < .001, \chi^2/df = 1.78$; CFI =

.916; RMSEA = .085 [.072, .097]. Co-reflection had a significant positive cross-lagged effect on offender rumination (positive in a statistical sense, with co-reflection being related to an increase in offender rumination from one timepoint to the next), whereas the effect on victim rumination was not significant. The converse cross-lagged relationships were not significant. Individual offender rumination had a significant positive cross-lagged effect on victim rumination, whereas the converse effect of victim rumination on offender rumination was not significant.

For co-brooding, the model yielded a marginal fit, $\chi^2(171) = 427.10, p < .001, \chi^2/df = 1.71$; CFI = .907; RMSEA = .081 [.067, .094]. The equality constraints on stabilities and cross-lagged effects across time significantly diminished the fit of the model, $\Delta\chi^2(18) = 45.69, p < .001$. Two constraints needed to be relaxed, namely the stabilities of victim and offender rumination at Time 1-2, which were lower than for the following lags. The remaining equality constraints did not significantly diminish the fit, $\Delta\chi^2(16) = 19.85, p = .227$. The overall model fit slightly improved, $\chi^2(248) = 401.25, p < .001, \chi^2/df = 1.62$; CFI = .920; RMSEA = .075 [.062, .089]. Co-brooding had significant positive cross-lagged effects on victim and offender rumination. The converse cross-lagged relationships were not significant. Individual victim rumination and offender rumination had no significant cross-lagged relationships with another (see Figure 3 for a summary of findings).

Cross-Lagged Relationships between Victim Forgiveness, Offender Self-Forgiveness and Co-Rumination

We next investigated the cross-lagged relationships between victim forgiveness, offender self-forgiveness, and either co-reflection or co-brooding (see Tables 5 and 6).

Co-reflection. For co-reflection, the model including genuine self-forgiveness yielded a marginal fit, $\chi^2(250) = 453.34, p < .001, \chi^2/df = 1.81$; CFI = .921; RMSEA = .086 [.074, .099]. The equality constraints on stabilities and cross-lagged effects across time did not

significantly diminish the fit of the model, $\Delta\chi^2(18) = 28.07, p = .061$. Forgiveness and genuine self-forgiveness had negative (marginal) cross-lagged effects on co-reflection; the converse relationships were not significant. Moreover, forgiveness had a significant negative cross-lagged effect on genuine self-forgiveness; the converse effect was not significant.

The model including self-punitiveness yielded an acceptable fit, $\chi^2(250) = 418.61, p < .001, \chi^2/df = 1.67$; CFI = .933; RMSEA = .079 [.065, .092]. The equality constraints on stabilities and cross-lagged effects across time significantly diminished the fit of the model, $\Delta\chi^2(18) = 32.23, p = .021$. The cross-lagged effect of self-punitiveness on forgiveness at Time 1-2 needed to be relaxed. The remaining equality constraints did not significantly diminish the fit, $\Delta\chi^2(17) = 22.97, p = .150$, and the overall model fit slightly improved, $\chi^2(249) = 409.35, p < .001, \chi^2/df = 1.64$; CFI = .936; RMSEA = .077 [.063, .090]. Forgiveness had a negative cross-lagged effect on co-reflection, while the effect of self-punitiveness was not significant (although it was marginally positive; see further models below); the converse relationships were not significant. Moreover, forgiveness had a significant negative cross-lagged effect on self-punitiveness; conversely, self-punitiveness had a negative effect on forgiveness, but at Time 1-2 only.

Co-brooding. For co-brooding, the model including genuine self-forgiveness yielded an acceptable fit, $\chi^2(250) = 423.07, p < .001, \chi^2/df = 1.69$; CFI = .919; RMSEA = .080 [.066, .093]. The equality constraints on stabilities and cross-lagged effects across time did not significantly diminish the fit of the model, $\Delta\chi^2(18) = 23.67, p = .166$. Forgiveness had negative cross-lagged effects on co-brooding, but genuine self-forgiveness did not; the converse relationships were not significant. In this model, the cross-lagged effect of forgiveness on genuine self-forgiveness was only marginally significant, and the converse effect was again not significant.

The model including self-punitiveness yielded an acceptable fit, $\chi^2(250) = 401.50, p <$

.001, $\chi^2/df = 1.61$; CFI = .929; RMSEA = .075 [.061, .088]. The equality constraints on stabilities and cross-lagged effects across time only marginally diminished the fit of the model, $\Delta\chi^2(18) = 26.99$, $p = .079$. However, to be consistent with the model with co-reflection, we relaxed the cross-lagged effect of self-punitiveness on forgiveness at Time 1-2. The remaining equality constraints did not significantly diminish the fit, $\Delta\chi^2(17) = 17.04$, $p = .427$, and the overall model fit slightly improved, $\chi^2(249) = 391.91$, $p < .001$, $\chi^2/df = 1.57$; CFI = .933; RMSEA = .073 [.059, .086]. Forgiveness had a negative cross-lagged effect on co-brooding, self-punitiveness did not; conversely, co-brooding had a positive cross-lagged effect on self-punitiveness, whereas the effect on forgiveness was not significant. Moreover, forgiveness had a significant negative cross-lagged effect on self-punitiveness; conversely, self-punitiveness had a negative effect on forgiveness, but at Time 1-2 only. The results are summarized in Figure 4.

Cross-Lagged Relationships between (Self-)Forgiveness, Individual Rumination and Co-Rumination

Focussing on victims and offenders separately, we next tested models with individual and co-rumination in tandem, and their relationships to (self-)forgiveness. We first report the findings for victims (see Table 7).

Victims. The model with co-reflection yielded a marginal fit, $\chi^2(250) = 453.82$, $p < .001$, $\chi^2/df = 1.82$; CFI = .916; RMSEA = .086 [.074, .099]. The equality constraints on stabilities and cross-lagged effects across time did not significantly diminish the fit of the model, $\Delta\chi^2(18) = 28.57$, $p = .054$. Forgiveness had significant negative cross-lagged effects on both individual rumination and co-reflection; the converse relationships were not significant. Co-reflection and individual rumination had no significant cross-lagged relationships with another.

The model with co-brooding yielded an acceptable fit, $\chi^2(250) = 402.32$, $p < .001$,

$\chi^2/df = 1.61$; CFI = .927; RMSEA = .075 [.061, .088]. The equality constraints on stabilities and cross-lagged effects across time did not significantly diminish the fit of the model, $\Delta\chi^2(18) = 25.71, p = .107$. Forgiveness had significant negative cross-lagged effects on both individual rumination and co-brooding; the converse relationships were not significant. Co-brooding had a significant positive cross-lagged effect on individual rumination; the converse effect was not significant.

Offenders. For offenders, we tested again two sets of models, for genuine self-forgiveness and self-punitiveness, respectively (Tables 8 and 9). The model with genuine self-forgiveness and co-reflection yielded a marginal fit, $\chi^2(250) = 448.56, p < .001, \chi^2/df = 1.79$; CFI = .919; RMSEA = .085 [.073, .098]. The equality constraints on stabilities and cross-lagged effects across time did not significantly diminish the fit of the model, $\Delta\chi^2(18) = 24.03, p = .154$. Genuine self-forgiveness had significant negative cross-lagged effects on co-reflection; the converse relationship was not significant. Individual rumination had significant positive cross-lagged effects on genuine self-forgiveness; the converse relationship was not significant. Co-reflection had a significant positive cross-lagged effect on individual rumination; conversely, individual rumination had a significant positive effect on co-reflection.

The model with genuine self-forgiveness and co-brooding yielded a marginal fit, $\chi^2(250) = 442/22, p < .001, \chi^2/df = 1.77$; CFI = .903; RMSEA = .084 [.071, .097]. The equality constraints on stabilities and cross-lagged effects across time significantly diminished the fit of the model, $\Delta\chi^2(18) = 30.19, p = .036$. The equality constraint on stability of offender rumination at Time 1-2 needed to be relaxed. The remaining equality constraints did not significantly diminish the fit, $\Delta\chi^2(17) = 13.64, p = .693$, and the overall model fit slightly improved, $\chi^2(249) = 425.67, p < .001, \chi^2/df = 1.71$; CFI = .903; RMSEA = .081 [.067, .094]. Genuine self-forgiveness had no significant cross-lagged effects on co-brooding and

individual rumination. Conversely, individual rumination had a positive cross-lagged effect on genuine self-forgiveness, while co-brooding had no significant effect. Co-brooding had a significant positive effect on individual rumination, whereas the converse relationship was not significant.

The model with self-punitiveness and co-reflection yielded an acceptable fit, $\chi^2(250) = 419.61, p < .001, \chi^2/df = 1.68; CFI = .930; RMSEA = .079 [.066, .092]$. The equality constraints on stabilities and cross-lagged effects across time did not significantly diminish the fit of the model, $\Delta\chi^2(18) = 23.82, p = .161$. Self-punitiveness had significant positive cross-lagged effects on co-reflection and individual rumination; conversely, individual rumination, but not co-reflection, had a significant positive cross-lagged effect on self-punitiveness. Co-reflection had a significant positive cross-lagged effect on individual rumination; the converse was not statistically significant.

The model with self-punitiveness and co-brooding yielded an acceptable fit, $\chi^2(250) = 410.55, p < .001, \chi^2/df = 1.64; CFI = .919; RMSEA = .077 [.063, .090]$. The equality constraints on stabilities and cross-lagged effects across time did not significantly diminish the fit of the model, $\Delta\chi^2(18) = 27.33, p = .073$. Self-punitiveness had significant positive cross-lagged effects on co-brooding and individual rumination; conversely, individual rumination and co-brooding had significant positive cross-lagged effects on self-punitiveness. Co-brooding had a significant positive cross-lagged effect on individual rumination; the converse was not statistically significant.

The results are summarized in Figure 5. On the whole, victim forgiveness seemed to reduce co-reflection, co-brooding, and victims' individual rumination. Offender genuine self-forgiveness seemed to decrease co-reflection, whereas offender self-punitiveness appeared to increase co-reflection, co-brooding, and offenders' individual rumination. Conversely, co-reflection and co-brooding did not affect forgiveness or genuine self-forgiveness, but co-

brooding seemed to lead to an increase in self-punitiveness. Co-reflection and co-brooding appeared to increase offender rumination, and co-brooding also to increase victim rumination. Conversely, offender rumination seemed to increase self-punitiveness but also genuine self-forgiveness.

Discussion

The present paper reports an empirical investigation of co-rumination following wrongdoing, its relationship to individual rumination, and their various theoretically derived roles in forgiveness and self-forgiveness processes. We used a prospective-longitudinal dyadic design to track couples' feelings and perceptions about a transgression event for several days (Wenzel et al., 2021). We then used cross-lagged panel analyses, with the dyad as unit of analysis, to investigate the lagged effects of one variable on another. A key strength of the present research is the dyad-level operationalization of co-rumination—in both its more and less constructive forms of co-reflection and co-brooding, respectively. The two forms of co-rumination were treated as latent constructs using equivalent victim and offender ratings of their co-ruminative behaviour as indicators. This made sure that co-rumination was examined as a dyadic behaviour and was not merely one party's partial perception of it. It allowed us to compare the implications of co-rumination across both victim and offender roles. Furthermore, by using latent variables and restricting factor loadings of the indicators to be equal across timepoints, we could ensure that the meaning of the co-reflection and co-brooding variables remained the same over time—that change was not confounded with variation in meaning.

First, the findings consistently showed that co-rumination predicts subsequent individual rumination, with no evidence for the converse relation (aside from an unstable effect of offender rumination on co-reflection). This was the case for victims and offenders alike, except that victim rumination was affected by co-brooding only, whereas offender

rumination was affected by co-brooding and co-reflection. The latter may suggest that, for offenders, rumination includes a more productive component of processing what has occurred, in line with the finding that offender rumination was predictive of subsequent genuine self-forgiveness (alongside self-punitiveness). Above all, however, the finding of co-rumination apparently increasing rumination, rather than the converse, is interesting in that it suggests that co-rumination is not just an outlet of individual repetitive thinking. Rather, it suggests that rumination can have a *social basis*.

Rumination is not (merely) an intrapsychic phenomenon due to individuals' cognitive control limitations, working memory deficits, or attentional focus (see Whitmer & Gotlib, 2013). Rather, it is also a product of social interaction and debate—whether this involves the mutual unproductive rehashing of positions or, for offenders at least, attempts at jointly gaining insights and understanding. The present findings show that co-rumination between parties involved in a transgression can be spontaneous, and this spontaneous collective engagement and processing gives both parties 'something to think about' and individually ruminate over at the intrapersonal level.

Second, the findings evidence that forgiveness and self-forgiveness reduce co-rumination. Victims' forgiveness was related to reduced subsequent co-brooding and co-reflection; offenders' *lack of* self-punitiveness was related to reduced subsequent co-brooding and co-reflection, while genuine self-forgiveness was related to reduced subsequent co-reflection. The results suggest that forgiveness and self-forgiveness discourage or obviate further engagement with the partner about the wrongdoing. This can, of course, be a good thing in that it may reduce further confrontation and discordance about the issue and thus contribute to relationship satisfaction. On the other hand, however, it may also prevent the partners from fully processing and coming to terms with the issue (for example, if the forgiveness came swiftly following a disproportionately severe transgression), which may

thus continue to loom as an unresolved event over the relationship.

Similar findings also emerged for individual rumination. Victims' forgiveness was negatively related to their subsequent individual rumination, and offenders' *lack of self-punitiveness* was negatively related to their individual rumination. These results run counter to a predominant view in social psychology that rumination impedes forgiveness and self-forgiveness. Our results provide evidence for the reverse influence: (self-)forgiveness can reduce rumination (Suchdey et al., 2005; Ysseldyk et al., 2007). This finding illustrates that (self-)forgiveness may signal a sense of psychological closure in victims and offenders that can effectively release the mental resources they would otherwise dedicate to continue thinking about the incident.

Third, the findings for genuine self-forgiveness showed a different pattern, in that individual offender rumination was positively related to subsequent genuine self-forgiveness (whereas the converse relationship was not significant). This suggests that individual rumination promotes genuine self-forgiveness. An offender cognitively engaging with their wrongdoing allows them to work through their responsibility. It fosters moral learning and recommitments that allow them to restore their moral self while (or, in fact, through) accepting guilt and responsibility—that is, genuine self-forgiveness (Woodyatt & Wenzel, 2013, 2014). As co-reflection showed a positive lagged effect on offender rumination, one could further argue that offender rumination mediates positive effect of co-rumination on genuine self-forgiveness. Co-reflection may thus have indirect benefits for genuine self-forgiveness. However, we need to be cautious with this interpretation, as we did not specifically test mediating pathways longitudinally (see Cole & Maxwell, 2003). It is nevertheless interesting that the relationships of genuine self-forgiveness, co-reflection, and individual offender rumination describe a negative feedback cycle: co-reflection appears to foster offender rumination, which fosters genuine self-forgiveness, which reduces co-reflection. Genuine

self-forgiveness may therefore be a repair process that describes a cycling down of interpersonal and individual engagement with the issue.

In contrast, self-punitiveness shows escalating feedback cycles with both co-brooding and individual rumination. In the final model, self-punitiveness had positive lagged effects on co-brooding and offender rumination, and both co-brooding and offender rumination had positive lagged effects on self-punitiveness. These relationships may represent a self-defeating feedback loop that offenders find it difficult to escape from; a self-sustaining “cycle of self-condemnation” (Woodyatt & Wenzel, 2020). The only upside of self-punitiveness is that it also increases co-reflection as well as individual rumination, which, as discussed, can increase genuine self-forgiveness. Genuine self-forgiveness could provide a way out of the destructive cycle, but future research would need to investigate more specifically how self-punitiveness and genuine self-forgiveness processes tie in with another and progress over time. It is plausible that genuine self-forgiveness and self-punitiveness initially co-occur—as a function of one’s painful realization *and* working through one’s guilt—but the question remains which of these up- or down-cycling processes wins the upper hand, or under which conditions.

Overall, the present findings paint a complex picture for the role of co-rumination in processes of forgiveness and self-forgiveness. Most clearly, it is co-rumination, in the form of co-reflection and/or co-brooding, that feeds individual rumination, rather than vice versa. Moreover, the different theoretical perspectives on the relationship between (co-)rumination and (self-)forgiveness, as reviewed in the introduction, find support in some ways: (1) both forgiveness and self-forgiveness *reduce individual and co-rumination* (victims’ forgiveness and offenders’ lack of self-punitiveness reduced individual rumination, co-reflection, and co-brooding, while genuine self-forgiveness reduced co-reflection only); (2) co-brooding and individual rumination foster self-punitiveness, and hence *impede self-forgiveness* for

offenders (but do not affect victims' forgiveness); and (3) individual rumination *promotes* (and appears to mediate co-reflection's promotion of) *genuine self-forgiveness*. The findings show an asymmetry between victims and offenders, in that for victims the influence seems to run in one direction only, namely from forgiveness to (co-)rumination, whereas for offenders it seems to run in both directions from (co-)rumination to self-punitiveness, but also from self-punitiveness and genuine self-forgiveness to (co-)rumination.

Of course, any inferences of directionality require caution when dealing with correlational data only, even if longitudinal, due to the possibility of confounding effects of unmeasured third variables. Another limitation of the present research is that the complexity of the models (and limited sample size) did not allow us to build the models any larger; hence, we had to resort to building complementary but manageable models for an overall picture. The upside of this approach is that it allows an assessment of the reliability of the paths in which the different part-models overlap. Our data showed largely consistent results between the different models, which strengthen confidence in the findings. Finally, the reported transgressions were generally only moderately severe with ratings of around, or below, the scale mid-point. This is a disadvantage of the prospective design, as it is simply not very likely that relationship couples experience serious incidents within just a couple of weeks of signing up to a study (*and* are willing to fill in concurrent surveys about those). Of course, the advantage of the method is that thoughts and feelings can be measured more or less as they emerge and develop in real-time. However, future research may need to use different methods, and/or possibly specific samples more at risk of serious transgressions (if this is ethically possible), to more fully understand the role of co-rumination in forgiveness and self-forgiveness across the full breadth of relationship conflict.

Further research may also need to investigate in more detail what people do when they co-ruminate, co-reflect or co-brood. First, while we adopted the distinction between co-

reflection and co-brooding from prior research (Bastin et al., 2014; Horn & Maercker, 2016), it is possible that, specifically with more adversarial roles such as victim and offender, there may be a greater variety of co-rumination strategies, or perhaps blends of strategies. For example, parties may merely feign responsiveness to what their partner says for manipulative purposes; they may seem to reflect but actually be more interested in persuading the partner of their own view rather than understanding the wrongdoing more fully. Micro-analyses of actual communications between co-ruminating partners may be an avenue for further research to identify greater nuances in co-rumination behaviour.

Moreover, in the present research, we studied the relationships of co-rumination (and rumination) with victim forgiveness and offender self-forgiveness, but it would be interesting to drill deeper into mediating processes. For example, in what ways do forgiveness and self-forgiveness apparently obviate the need to co-ruminate about the wrongdoing? To what extent may affect regulation (e.g., Worthington & Scherer, 2004), restored trust in self or other (e.g., Woodyatt & Wenzel, 2014), or the reaffirmation of a relational bond between the parties (e.g., Karremans & van Lange, 2008), account for these effects? Likewise, precisely how does offender rumination facilitate their genuine self-forgiveness? What kind of thinking, narration, or meaning-making may allow them to forgive themselves (e.g., Graham et al., 2017)? What differentiates rumination that leads an offender to genuinely forgive themselves or to sink deeper in a cycle of self-condemnation? And how does co-rumination stimulate these ruminative processes?

Moreover, as forgiveness reduces co-rumination but apparently is not influenced by it, not even by constructive co-reflection, this raises the question where the forgiveness derives from. More specifically, assuming forgiveness is indeed a negotiated dyadic process, what form of engagement, or what outcomes of engagement, do then contribute to the victim's forgiveness? Perhaps a shared cognitive engagement is not sufficient *unless* it involves more

listening than talking (Kluger et al., 2021), mutual perspective-taking and the perception that the other takes one's own perspective (Berndsen & Wenzel, 2021), expressions of respect, humility or conciliation that returns status and agency to the parties, or the reaffirmation of shared values (Wenzel & Okimoto, 2010). There are still many questions for future research.

In conclusion, the present research is the first to have extended the concept of co-rumination to the adversarial roles of victim and offender following an interpersonal transgression. Co-rumination appears to provide a social basis and social impetus for individual rumination; forgiveness and self-forgiveness reduce engagement in co-rumination an individual rumination; but co-rumination—via individual rumination—may also promote offender genuine self-forgiveness. While complex, these studies point to the importance of co-rumination in dyadic processes of intrapersonal and interpersonal repair following wrongdoing.

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Endnotes

¹ The survey instrument further included the concrete/abstract thinking scale developed by Wenzel and Coughlin (2020), which was meant to tap into different qualities of individual repetitive thinking. The scale distinguishes between concrete thinking about details of the events, experiences in the situation (e.g., “My thoughts have mainly been about... - ...the actions that occurred”), and abstract thinking about the incident in the context of one’s relationship, its meaning and implications (e.g., “My thoughts have mainly been about... - ...where the event fits in the larger scheme of things”). However, the factorial distinction between concrete and abstract thinking did not hold in the present study, and we therefore report the results for the single-item measure only. However, very similar findings were obtained with the concrete/abstract scales of repetitive thinking.

Table 1. Means and Standard Deviations

	Time 1		Time 2		Time 3		Time 4	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Severity (Victim)	3.96	1.28						
Severity (Offender)	3.17	1.28						
Rumination (Victim)	4.28	1.58	3.11	1.66	2.55	1.65	2.26	1.60
Rumination (Offender)	3.77	1.98	3.12	1.64	2.44	1.67	2.39	1.75
Co-reflection (average)	4.44	1.50	4.08	1.64	3.39	1.65	3.19	1.80
Co-brooding (average)	3.81	1.48	3.14	1.50	2.50	1.39	2.26	1.39
Forgiveness	5.91	0.91	6.02	0.95	6.09	1.00	6.21	0.92
Genuine self-forgiveness	4.43	1.24	4.35	1.32	4.48	1.40	4.46	1.38
Self-punitiveness	2.45	1.14	2.3	1.05	2.2	1.14	2.16	1.21

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 2. *Correlations*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
1. Severity (Victim)	--																													
2. Severity (Offender)	.19	--																												
3. Rumination (Victim) T1	.52	.10	--																											
4. Rumination (Offender) T1	.09	.43	.30	--																										
5. Co-reflection (average) T1	.15	.33	.16	.18	--																									
6. Co-brooding (average) T1	.29	.12	.25	.14	.06	--																								
7. Forgiveness T1	-.27	-.02	-.18	-.07	.12	-.30	--																							
8. Genuine self-forgiveness T1	.05	.40	.18	.35	.58	-.03	.01	--																						
9. Self-punitiveness T1	.20	.43	.13	.29	.25	.21	-.21	.50	--																					
10. Rumination (Victim) T2	.44	.22	.40	.25	.07	.44	-.44	.08	.18	--																				
11. Rumination (Offender) T2	.28	.38	.15	.49	.18	.22	-.29	.27	.39	.38	--																			
12. Co-reflection (average) T2	.25	.30	.28	.17	.35	.19	-.19	.31	.19	.38	.42	--																		
13. Co-brooding (average) T2	.32	.16	.31	.12	-.06	.64	-.49	-.02	.27	.57	.36	.42	--																	
14. Forgiveness T2	-.27	-.09	-.12	-.03	-.03	-.23	.76	-.07	-.34	-.41	-.35	-.23	-.44	--																
15. Genuine self-forgiveness T2	.05	.37	.06	.34	.49	.03	.07	.73	.40	.07	.35	.34	.03	-.06	--															
16. Self-punitiveness T2	.26	.42	.09	.27	.19	.32	-.36	.40	.73	.28	.59	.24	.36	-.50	.44	--														
17. Rumination (Victim) T3	.38	.11	.41	.16	.13	.49	-.39	.10	.21	.75	.32	.35	.58	-.47	.08	.35	--													
18. Rumination (Offender) T3	.21	.29	.09	.35	.28	.19	-.33	.27	.44	.33	.74	.33	.29	-.37	.32	.57	.26	--												
19. Co-reflection (average) T3	.27	.25	.16	.17	.30	.26	-.25	.23	.37	.40	.47	.60	.38	-.34	.28	.42	.46	.57	--											
20. Co-brooding (average) T3	.22	.19	.18	.20	-.05	.54	-.45	-.03	.32	.42	.41	.25	.69	-.45	.04	.42	.40	.46	.54	--										
21. Forgiveness T3	-.11	-.07	.06	-.08	.02	-.16	.65	-.03	-.28	-.24	-.19	-.07	-.26	.78	.07	-.42	-.32	-.30	-.20	-.36	--									
22. Genuine self-forgiveness T3	.16	.24	.20	.28	.49	.11	-.08	.71	.46	.18	.40	.31	.13	-.22	.82	.49	.22	.39	.40	.14	-.02	--								
23. Self-punitiveness T3	.21	.31	.08	.23	.17	.29	-.32	.33	.72	.28	.56	.17	.37	-.45	.26	.72	.31	.63	.43	.42	-.37	.44	--							
24. Rumination (Victim) T4	.27	.22	.19	.13	.07	.40	-.43	.15	.36	.69	.35	.21	.50	-.54	.03	.50	.75	.34	.42	.45	-.50	.19	.47	--						
25. Rumination (Offender) T4	.25	.29	.10	.40	.19	.21	-.40	.25	.42	.37	.76	.31	.37	-.42	.25	.58	.33	.81	.56	.53	-.33	.33	.62	.37	--					
26. Co-reflection (average) T4	.17	.19	.04	.10	.17	.09	-.34	.15	.36	.39	.46	.52	.33	-.43	.16	.45	.39	.50	.75	.41	-.36	.30	.48	.47	.56	--				
27. Co-brooding (average) T4	.19	.16	.15	.10	.003	.35	-.45	.02	.29	.46	.34	.30	.59	-.53	-.03	.40	.45	.38	.50	.70	-.44	.13	.38	.61	.48	.61	--			
28. Forgiveness T4	-.07	-.003	.06	-.04	.03	-.08	.61	-.01	-.21	-.17	-.15	-.02	-.18	.77	.08	-.36	-.27	-.23	-.15	-.28	.92	.02	-.30	-.43	-.28	-.29	-.35	--		
29. Genuine self-forgiveness T4	.001	.25	.06	.26	.46	.01	-.03	.67	.45	.13	.34	.28	.10	-.14	.83	.46	.17	.36	.35	.10	-.07	.81	.35	.17	.34	.32	.08	-.02	--	
30. Self-punitiveness T4	.22	.27	.03	.25	.18	.25	-.36	.31	.68	.23	.55	.15	.34	-.52	.30	.78	.29	.61	.36	.41	-.50	.39	.84	.45	.64	.48	.41	-.46	.41	--

Note: Correlations $>.19$ are significant at $p < .05$.

Table 3. *Measurement Model of Dyadic Constructs of Co-Reflection and Co-Brooding over Four Time-Points*

	Standardised Estimate ^a				Unstandardised Estimate	SE	t	p
Co-reflection								
Loadings	T1	T2	T3	T4				
Offender item 1	0.70	0.83	0.87	0.84	1.00	--	--	--
Offender item 2	0.69	0.88	0.92	0.91	1.10	0.05	20.47	<.001
Victim item 1	0.35	0.36	0.45	0.42	0.47	0.06	7.60	<.001
Victim item 2	0.33	0.36	0.46	0.44	0.47	0.06	7.58	<.001
Stability	T 1-2	T 2-3	T 3-4					
	0.73	0.73	0.90		0.89	0.07	13.05	<.001
Co-reflection								
Loadings	T1	T2	T3	T4				
Offender item 1	0.53	0.53	0.52	0.61	1.00	--	--	--
Offender item 2	0.42	0.47	0.53	0.55	0.84	0.11	7.91	<.001
Victim item 1	0.74	0.78	0.88	0.75	1.46	0.17	8.85	<.001
Victim item 2	0.68	0.77	0.85	0.81	1.45	0.17	8.71	<.001
Stability	T 1-2	T 2-3	T 3-4					
	0.83	0.87	0.91		0.87	0.05	17.37	<.001

^a Standardised estimates vary between timepoints and across lags.

Table 4. *Cross-Lagged Models for Individual Rumination and Co-Rumination Variables*

			Standardised Estimate ^a	Unstandardised Estimate	SE	t	p
Cross-lagged effects							
Co-reflection	→	V. rumination	-0.004	-0.005	0.05	-0.09	.927
Co-reflection	→	O. rumination	0.12	0.15	0.06	2.63	.009
V. rumination	→	Co-reflection	0.01	0.01	0.05	0.17	.868
O. rumination	→	Co-reflection	0.11	0.08	0.06	1.51	.130
V. rumination	→	O. rumination	0.06	0.06	0.04	1.43	.154
O. rumination	→	V. rumination	0.12	0.10	0.05	2.18	.029
Stabilities							
Co-reflection			0.69	0.86	0.08	11.1	<.001
V. rumination		Time 1-2	0.39	0.41	0.09	4.62	<.001
		Time 2-3-4	0.71	0.71	0.05	15.59	<.001
O. rumination		Time 1-2	0.46	0.39	0.07	6.01	<.001
		Time 2-3-4	0.65	0.67	0.05	12.36	<.001
Cross-lagged effects							
Co-brooding	→	V. rumination	0.31	0.48	0.10	5.06	<.001
Co-brooding	→	O. rumination	0.14	0.22	0.09	2.47	.013
V. rumination	→	Co-brooding	0.02	0.01	0.03	0.39	.694
O. rumination	→	Co-brooding	0.04	0.02	0.03	0.96	.339
V. rumination	→	O. rumination	0.01	0.01	0.05	0.27	.784
O. rumination	→	V. rumination	0.07	0.06	0.04	1.50	.134
Stabilities							
Co-brooding			0.69	0.85	.063	13.39	<.001
V. rumination		Time 1-2	0.28	0.29	.082	3.49	<.001
		Time 2-3-4	0.52	0.53	.054	9.83	<.001
O. rumination		Time 1-2	0.47	0.38	.067	5.75	<.001
		Time 2-3-4	0.69	0.74	.046	15.93	<.001

Note. V. = Victim, O. = Offender.

^a Standardised estimates vary slightly across lags; estimates for the first relevant lag are reported here.

Table 5. *Cross-Lagged Models for Co-Reflection and (Self-)Forgiveness Variables*

		Standardised Estimate ^a	Unstandardised Estimate	SE	t	p
Cross-lagged effects						
Co-reflection	→ Forgiveness	0.01	0.01	0.02	0.44	.662
Co-reflection	→ Genuine self-f.	0.04	0.04	0.04	0.97	.332
Forgiveness	→ Co-reflection	-0.22	-0.38	0.07	-5.11	<.001
Genuine self-f.	→ Co-reflection	-0.11	-0.14	0.07	-1.92	.054
Forgiveness	→ Genuine self-f.	-0.07	-0.11	0.05	-2.23	.026
Genuine self-f.	→ Forgiveness	0.01	0.01	0.02	0.47	.642
Stabilities						
Co-reflection		0.77	0.93	0.08	11.41	<.001
Forgiveness		0.78	0.84	0.03	30.81	<.001
Genuine self-f.		0.72	0.79	0.04	18.57	<.001
Cross-lagged effects						
Co-reflection	→ Forgiveness	0.02	0.02	0.02	0.97	.332
Co-reflection	→ Self-punitiveness	0.03	0.02	0.03	0.91	.365
Forgiveness	→ Co-reflection	-0.19	-0.36	0.08	-4.50	<.001
Self-punitiveness	→ Co-reflection	0.09	0.13	0.08	1.70	.090
Forgiveness	→ Self-punitiveness	-0.20	-0.25	0.04	-6.13	<.001
Self-punitiveness	→ Forgiveness					
	Time 1-2	-0.19	-0.17	0.05	-3.36	<.001
	Time 2-3-4	0.01	0.01	0.03	0.32	.748
Stabilities						
Co-reflection		0.66	0.82	0.07	12.51	<.001
Forgiveness		0.74	0.83	0.03	28.71	<.001
Self-punitiveness		0.71	0.70	0.04	18.58	<.001

Note. Genuine self-f. = Genuine self-forgiveness.

^a Standardised estimates vary slightly across lags; estimates for the first relevant lag are reported here.

Table 6. *Cross-Lagged Models for Co-Brooding and (Self-)Forgiveness Variables*

			Standardised	Unstandardised	<i>SE</i>	<i>t</i>	<i>p</i>
			Estimate ^a	Estimate			
Cross-lagged effects							
Co-brooding	→	Forgiveness	0.05	0.05	0.03	1.37	.170
Co-brooding	→	Genuine self-f.	0.03	0.04	0.06	0.62	.534
Forgiveness	→	Co-brooding	-0.19	-0.21	0.05	-4.24	<.001
Genuine self-f.	→	Co-brooding	0.01	0.01	0.03	0.40	.693
Forgiveness	→	Genuine self-f.	-0.06	-0.09	0.05	-1.65	.099
Genuine self-f.	→	Forgiveness	0.02	0.02	0.02	0.86	.393
Stabilities							
Co-brooding			0.78	0.79	0.06	14.01	<.001
Forgiveness			0.79	0.86	0.03	28.12	<.001
Genuine self-f.			0.74	0.81	0.03	23.52	<.001
Cross-lagged effects							
Co-brooding	→	Forgiveness	0.04	0.04	0.03	1.31	.189
Co-brooding	→	Self-punitiveness	0.09	0.10	0.05	2.05	.040
Forgiveness	→	Co-brooding	-0.17	-0.19	0.05	-3.84	<.001
Self-punitiveness	→	Co-brooding	0.05	0.05	0.04	1.32	.187
Forgiveness	→	Self-punitiveness	-0.16	-0.20	0.05	-4.43	<.001
Self-punitiveness	→	Forgiveness					
		Time 1-2	-0.19	-0.16	0.05	-3.30	<.001
		Time 2-3-4	0.02	0.01	0.03	0.51	.613
Stabilities							
Co-brooding			0.78	0.78	0.06	13.59	<.001
Forgiveness			0.76	0.85	0.03	26.80	<.001
Self-punitiveness			0.71	0.70	0.04	19.80	<.001

Note. Genuine self-f. = Genuine self-forgiveness.

^a Standardised estimates vary slightly across lags; estimates for the first relevant lag are reported here.

Table 7. *Cross-Lagged Models for Co-Reflection/Co-Brooding, Victim Rumination, and Forgiveness*

		Standardised Estimate ^a	Unstandardised Estimate	SE	t	p
Cross-lagged effects						
Co-reflection	→ V. rumination	0.04	0.05	0.04	1.13	.258
Co-reflection	→ Forgiveness	0.01	0.01	0.02	0.43	.664
V. rumination	→ Co-reflection	-0.04	-0.04	0.05	-0.85	.398
Forgiveness	→ Co-reflection	-0.24	-0.40	0.08	-5.28	<.001
V. rumination	→ Forgiveness	0.03	0.02	0.02	0.96	.336
Forgiveness	→ V. rumination	-0.26	-0.46	0.07	-7.14	<.001
Stabilities						
Co-reflection		0.75	0.90	0.07	13.69	<.001
V. rumination	Time 1-2	0.36	0.36	0.08	4.29	<.001
	Time 2-3-4	0.61	0.63	0.05	13.67	<.001
Forgiveness		0.81	0.84	0.03	29.43	<.001
Cross-lagged effects						
Co-brooding	→ V. rumination	0.24	0.40	0.10	4.28	<.001
Co-brooding	→ Forgiveness	0.04	0.04	0.04	0.99	.322
V. rumination	→ Co-brooding	0.04	0.03	0.03	0.90	.370
Forgiveness	→ Co-brooding	-0.17	-0.19	0.05	-3.94	<.001
V. rumination	→ Forgiveness	0.01	0.01	0.02	0.36	.722
Forgiveness	→ V. rumination	-0.19	-0.35	0.07	-5.04	<.001
Stabilities						
Co-brooding		0.79	0.78	0.07	11.72	<.001
V. rumination		0.42	0.46	0.05	10.18	<.001
Forgiveness		0.81	0.85	0.03	27.73	<.001

Note. V. = Victim, O. = Offender.

^a Standardised estimates vary slightly across lags; estimates for the first relevant lag are reported here.

Table 8. *Cross-Lagged Models for Co-Reflection/Co-Brooding, Offender Rumination, and Genuine Self-Forgiveness*

			Standardised Estimate ^a	Unstandardised Estimate	SE	t	p
Cross-lagged effects							
Co-reflection	→	O. rumination	0.17	0.24	0.06	3.81	<.001
Co-reflection	→	Genuine self-f.	0.02	0.02	0.04	0.45	.655
O. rumination	→	Co-reflection	0.19	0.15	0.05	2.94	.003
Genuine self-f.	→	Co-reflection	-0.16	-0.21	0.07	-2.87	.004
O. rumination	→	Genuine self-f.	0.10	0.07	0.03	2.34	.019
Genuine self-f.	→	O. rumination	-0.02	-0.02	0.06	-0.40	.692
Stabilities							
Co-reflection			0.77	0.92	0.08	10.55	<.001
O. rumination			0.59	0.57	0.05	12.57	<.001
Genuine self-f.			0.71	0.78	0.04	18.16	<.001
Cross-lagged effects							
Co-brooding	→	O. rumination	0.16	0.26	0.08	3.35	<.001
Co-brooding	→	Genuine self-f.	0.04	0.05	0.05	0.94	.348
O. rumination	→	Co-brooding	0.06	0.03	0.03	1.24	.214
Genuine self-f.	→	Co-brooding	-0.01	-0.01	0.03	-0.22	.830
O. rumination	→	Genuine self-f.	0.09	0.06	0.03	2.15	.032
Genuine self-f.	→	O. rumination	0.06	0.09	0.05	1.66	.096
Stabilities							
Co-brooding			0.82	0.87	0.05	16.57	<.001
O. rumination		Time 1-2	0.46	0.38	0.07	5.71	<.001
		Time 2-3-4	0.66	0.71	0.05	14.31	<.001
Genuine self-f.			0.72	0.79	0.04	21.40	<.001

Note. V. = Victim, O. = Offender.

^a Standardised estimates vary slightly across lags; estimates for the first relevant lag are reported here.

Table 9. *Cross-Lagged Models for Co-Reflection/Co-Brooding, Offender Rumination, and Self-Punitiveness*

			Standardised Estimate ^a	Unstandardised Estimate	SE	t	p
Cross-lagged effects							
Co-reflection	→	O. rumination	0.12	0.16	0.05	3.30	<.001
Co-reflection	→	Self-punitiveness	-0.01	-0.01	0.03	-0.35	.728
O. rumination	→	Co-reflection	0.09	0.08	0.06	1.37	.170
Self-punitiveness	→	Co-reflection	0.12	0.18	0.08	2.40	.016
O. rumination	→	Self-punitiveness	0.18	0.10	0.03	3.79	<.001
Self-punitiveness	→	O. rumination	0.22	0.36	0.07	5.59	<.001
Stabilities							
Co-reflection			0.63	0.79	0.07	10.63	<.001
O. rumination			0.52	0.49	0.05	10.48	<.001
Self-punitiveness			0.71	0.71	0.04	18.19	<.001
Cross-lagged effects							
Co-brooding	→	O. rumination	0.11	0.19	0.08	2.51	.012
Co-brooding	→	Self-punitiveness	0.16	0.17	0.05	3.60	<.001
O. rumination	→	Co-brooding	0.02	0.01	0.03	0.39	.700
Self-punitiveness	→	Co-brooding	0.10	0.09	0.04	2.23	.026
O. rumination	→	Self-punitiveness	0.12	0.07	0.03	2.76	.006
Self-punitiveness	→	O. rumination	0.22	0.32	0.07	4.86	<.001
Stabilities							
Co-brooding			0.79	0.83	0.05	15.71	<.001
O. rumination		Time 1-2	0.46	0.39	0.06	6.32	<.001
		Time 2-3-4	0.59	0.61	0.05	12.29	<.001
Self-punitiveness			0.69	0.68	0.04	17.37	<.001

Note. V. = Victim, O. = Offender.

^a Standardised estimates vary slightly across lags; estimates for the first relevant lag are reported here.

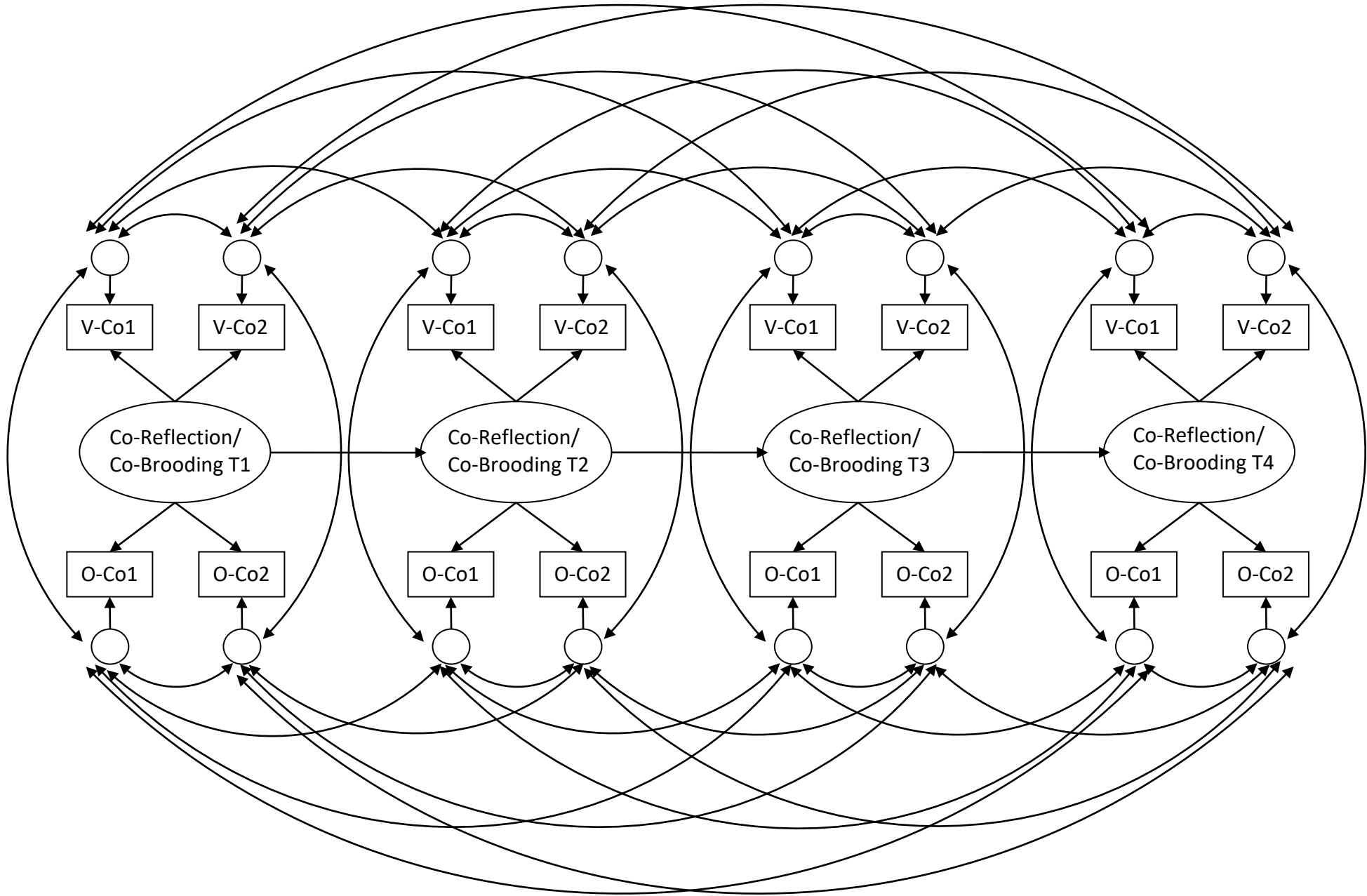


Figure 1. Dyadic measurement model of co-reflection/co-brooding over four time-points. (Victim and offender seriousness ratings, as Time 1 covariates, are omitted from the graph.) V = Victim, O = Offender, Co1 = Item 1 of Co-Reflection or Co-Brooding, Co2 = Item 2 of Co-Reflection or Co-Brooding. Item loadings for corresponding items, and stabilities between latent factors, set equal across time-points.

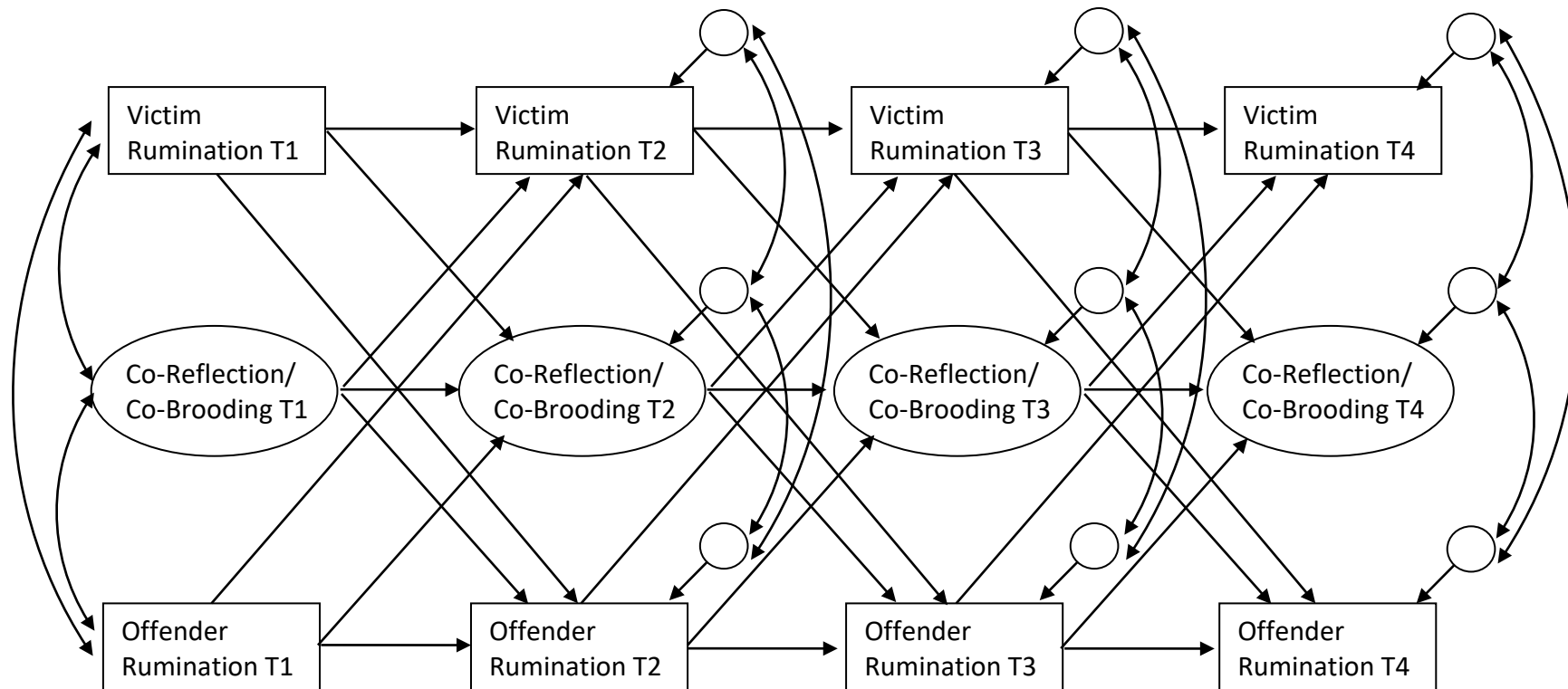


Figure 2. Cross-lagged regression model, with latent co-reflection/co-brooding constructs (measurement model omitted), and victim and offender variables as observed variables. The default model has corresponding cross-lagged paths and stabilities constrained to be equal across time-points. (Victim and offender seriousness ratings, as Time 1 covariates, are omitted from the graph.)

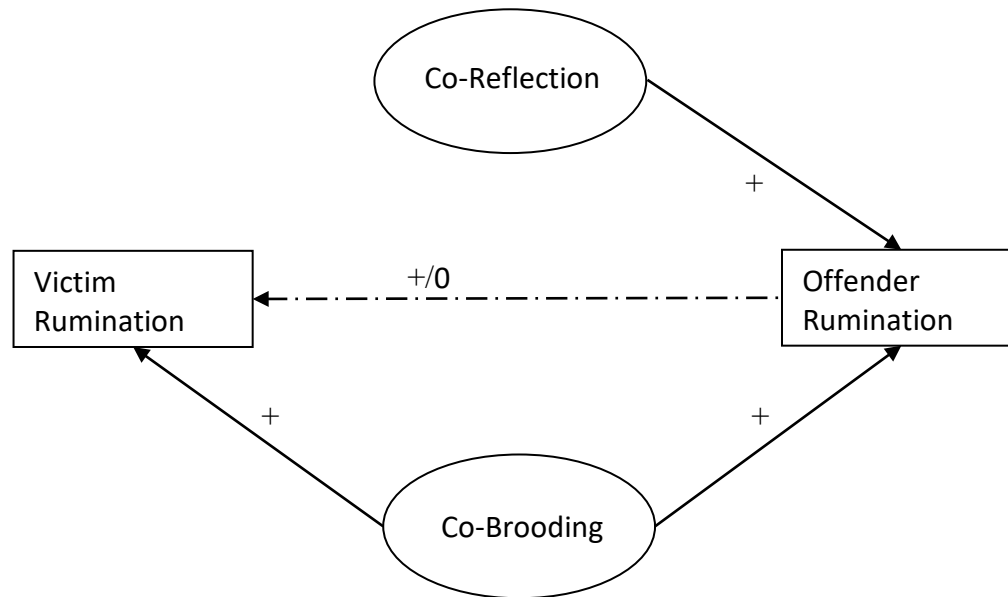


Figure 3. Summary depiction of cross-lagged effects for individual and co-rumination variables. Dash-dotted arrows indicate inconsistent results between the two models; result before the slash is from the model with co-reflection, the result after the slash is from the model with co-brooding.

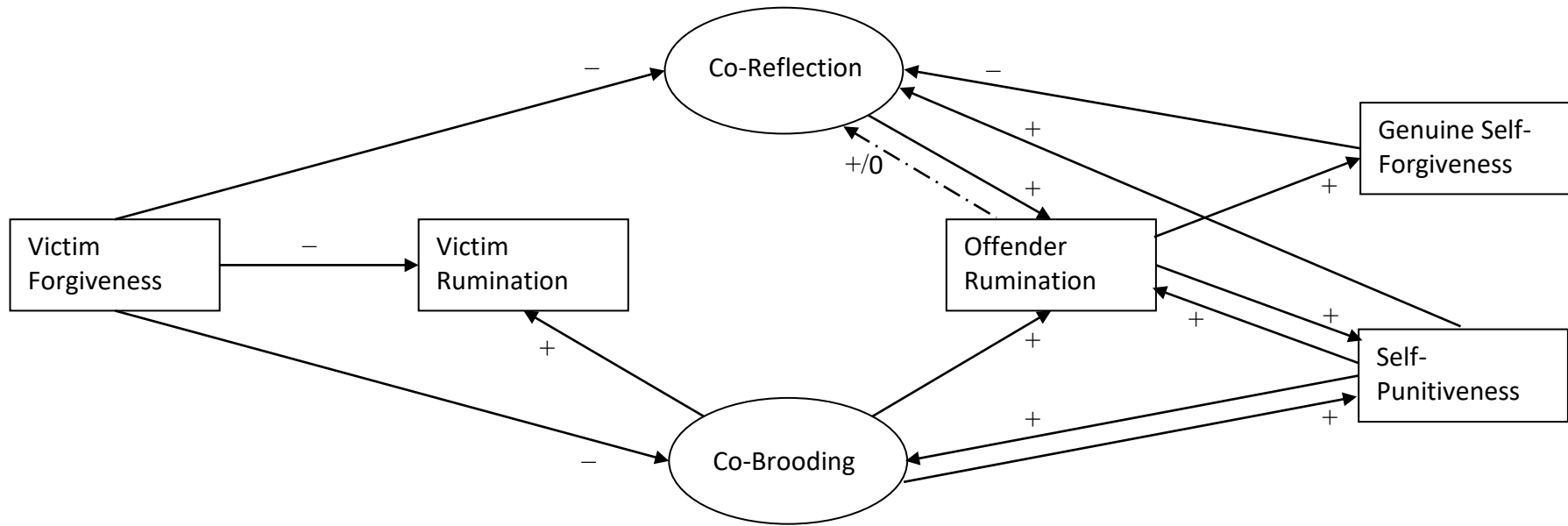


Figure 5. Summary depiction of cross-lagged effects for (self-)forgiveness, individual rumination, and co-rumination variables. Dash-dotted arrows indicate inconsistent results between the two models; result before the slash is from the model with genuine self-forgiveness, the result after the slash is from the model with self-punitiveness.