HOW INTERNET USE MAY AFFECT OUR RELATIONSHIPS
Chapter 4

Compulsive Internet Use, Responsiveness and Exclusion in Relationships
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Abstract
Perceived partner exclusion threatens the foundation of loving and trusting relationships and reduces relationship quality. People are sensitive to signs that they are being excluded, and can detect subtle cues. Some of these cues include not responding or attending to the other. Compulsive Internet use might communicate a lack of responsiveness to one’s partner. This research examined whether and how compulsive Internet use (CIU) affects perceptions of responsiveness and exclusion in a partner. An online survey showed that perceived partner responsiveness partially mediated the relation between perceived partner CIU and perceived partner exclusion. A prospective dyadic study among newlyweds confirmed these findings. Cross-partner and actor effects are discussed. The results suggest CIU might undermine responsiveness towards one’s partner, which affects the partner’s feelings of exclusion.
Perceived partner exclusion, the perception that one is separated from and excluded by one’s partner, threatens the foundation of loving and trusting relationships (Reis, Clark, & Holmes, 2004), and reduces relationship quality (Finkenauer, Kerkhof, Righetti, & Branje, 2009). Because people need high quality relationships (Baumeister & Leary, 1995), it is important for them to detect relationship threats and possible exclusion. Indeed, people are sensitive to any sign that they are being ignored and excluded, and can detect even subtle cues (Baumeister & Leary, 1995; Kerr & Levine, 2008; Pickett & Gardner, 2005). Some of these cues of exclusion include not responding or attending to the other and minimizing or avoiding interaction (Kerr & Levine, 2008). Here we propose that people use the perception of compulsive Internet use in one’s partner as a sign of exclusion.

Compulsive Internet use (CIU) is Internet use with addictive characteristics including withdrawal reactions when Internet use is impossible (e.g., unpleasant emotions), lack of control over Internet use (e.g., use of the Internet despite the intention or desire to stop or to decrease the use), and cognitive and behavioral preoccupation with the Internet (LaRose, Lin, & Eastin, 2003; van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008). Since CIU keeps people from engaging with their kin and from paying attention to their immediate social surroundings (Meerkerk, 2007; Wellman, Haase, Witte, & Hampton, 2001), perceiving CIU in one’s partner may serve as a signal for exclusion. To our knowledge, there is only one other study that proposes and tests a mechanism through which CIU might impact the quality of close relationships (Muusses, Finkenauer, Kerkhof, & Righetti, 2013). The study showed that people use the perception of their partner’s CIU as a gauge for their partner’s self-control, which they use in turn to judge their partner’s trustworthiness. Perceived CIU thus impacts evaluation of one’s partner. In this research we examine a mechanism through which perceived partner CIU affects how a person feels about the relationship. We propose and test the mechanism that people use the perception of their partner’s CIU as a signal that he/she is excluding them. Importantly, we propose that perceived partner responsiveness mediates this effect.

Perceived partner responsiveness, the belief that one’s partner cares about one’s welfare and will attend and respond to one’s desires, needs, concerns and goal strivings, is experienced by an individual when his or her partner understands, validates, and cares for the self (Reis et al., 2004). People use behavioral cues to infer responsiveness in their partner. The
behaviors associated with perceived partner CIU may represent such behaviors. Furthermore, based on evidence showing that people are highly sensitive to cues of exclusion, and that unresponsiveness and inattentiveness are used as such cues (Baumeister & Leary, 1995; Kerr & Levine, 2008; Pickett & Gardner, 2005), we pose that people in close relationships use perceived partner responsiveness as a sign of in- or exclusion by the partner. Consequently, the present study investigates whether people use perceived partner CIU as a cue for perceived partner exclusion, and whether this link is mediated by perceived partner responsiveness.

Compulsive Internet Use and Perceived Partner Responsiveness

Although online activities can be social in nature, the use of Internet devices is often not shared with people in the user's physical surrounding. Online activities can keep people from engaging with their kin, and the Internet can draw people's attention away from their immediate physical and social surroundings (Wellman et al., 2001; Young & Rodgers, 1998; Yang, Choe, Baity, Lee, & Cho, 2005). Therefore, people are likely to experience a lack in partner responsiveness when their partner uses the Internet. The feelings of a lack in responsiveness may be particularly pronounced for partners of more compulsive Internet users.

Different terms have been used for CIU (for an overview, see LaRose et al., 2003; Turel, Serenko, & Bontis, 2011). In this study, we use the term CIU to refer to a continuum of an overarching set of characteristics of Internet-related behaviors and preoccupations that can be experienced in the use of all Internet-mediated applications, ranging from less to more severe. CIU has been documented to be increasingly prevalent (e.g., Johansson & Götestam, 2004; Fu, Chan, Wong, & Yip, 2010; Park, Kim, & Cho, 2007). CIU affects relationship quality negatively, both for the person using the Internet compulsively (Kerkhof, Finkenauer, & Muusses, 2011), as for his or her relationship partner (Muusses et al., 2013).

Perceived partner responsiveness is an essential feature of close relationships, and a prime marker of relationship health and well-being (Clark & Mills, 1979; 1993; Laurenceau, Barrett, & Pietromonaco, 1998; Laurenceau, Barrett, & Rovine, 2005; Lemay, Clark, & Feeney, 2007; Reis et al., 2004). People use their perception of certain behaviors to gauge a partner's responsiveness. Although the extant literature mostly focuses on the presence of positive behaviors as a signal for perceived partner responsiveness (e.g., Kubacka, Finkenauer, Rusbult, & Keijsers, 2011; Laurenceau et al., 1998), it is likely that the absence of these behaviors and the presence of negative behaviors (e.g., not doing one's chores, being angry or irritable) also affect people's perception of partner responsiveness (Finkenauer, Wijngaards-de Meij, Reis, & Rusbult, 2010).

Partners of people who use the Internet more compulsively might be less likely to believe that their partner is responsive to their desires, needs, concerns, and goal strivings. We propose that perceiving one's partner to use the Internet compulsively might be used as a gauge for partner responsiveness. Although using online communication can increase time spent with existing friends and the quality of these relationships in adolescents (Valkenburg & Peter, 2007), preferring to
spend time online instead of spending time with others and conflict with social and partner relations are characteristics of CIU (Meerkerk, 2007). When people perceive that their partner is spending less time with them and more time on the Internet, they might interpret this perceived imbalance as a lowered interest in their welfare, needs, and concerns. Also, people might feel that their partner’s having trouble to stop using the Internet leads to failure to meet agreements with them, which might be perceived as being unresponsive to their needs. Finally, compulsive Internet users sometimes experience unpleasant and negative emotions when Internet use is ceased or becomes impossible (Meerkerk, 2007). People who perceive their partner to have these negative emotions might feel that their partner has more attention for his/her own negative feelings than for their welfare or concerns. Consequently, the characteristics of CIU and behaviors and emotions associated with it, lead us to propose that people who perceive CIU in their partner are more likely to infer lowered responsiveness from their partner. In turn, perceived partner responsiveness might affect perceived partner exclusion.

**Perceived Partner Responsiveness and Perceived Partner Exclusion**

Being excluded is harmful for people because it threatens the need to belong (Baumeister & Leary, 1995). The need to belong is defined as people’s need to form and maintain a minimum quantity of lasting, positive, and significant interpersonal relationships. They need to experience frequent, affectively pleasant interactions with others, which take place in the context of a temporally stable and enduring framework, which is characterized by mutual affective concern. A lack of belongingness constitutes severe deprivation and causes cognitive, emotional, and even physical ill effects (Baumeister & Leary, 1995). Social exclusion threatens the possibility for frequent and pleasant interactions within a stable and enduring framework of close relationships. Given its importance for survival and wellbeing, research established that people are highly sensitive to threats to the need to belong (Baumeister & Leary, 1995; Kerr & Levine, 2008; Pickett & Gardner, 2005). Detection of signals of exclusion elicits feeling of pain and distress, which can help in identifying social exclusion (Williams, 2007) and motivates attempts to strengthen and/or re-establish relationships (Kerr & Levine, 2008).

People use behavioral cues to infer their status of inclusion and exclusion, such as when the other minimizes or avoids interaction with them (e.g., giving very short responses; unanimated speech), when the other ignores social norms for interactions with them (e.g., failing to acknowledge their presence when entering the room), or when the other is not attending or responding to them (e.g., not noticing signals for attention or help; using mobile devices while talking to them; long pauses before responding; not making eye contact; not listening attentively) have been found to elicit feelings of exclusion (Kerr & Levine, 2008). These types of behaviors are similar to behaviors indicating a lack of responsiveness, suggesting that people might use a lack of perceived partner responsiveness as a signal of exclusion by the partner. The idea that people interpret a lack of responsiveness from their partner as a signal of
exclusion is supported by a study by Maisel and Gable (2009). This research showed that when people perceive support offered as being low in responsiveness, it is detrimental to their feelings of relationship connectedness (Maisel & Gable, 2009). Relationship connectedness (e.g., reverse coded measured by asking if people felt out of touch and disconnected from their partner) can be considered the opposite of partner exclusion (e.g., measured by asking if people experienced a lack of companionship in their relationship with their partner and if they felt separated from your partner). Consequently, Maisel and Gable’s (2009) results suggest that perceived partner responsiveness negatively affects perceived partner exclusion. We propose that relationship partners might use perceived partner responsiveness as a signal for perceived partner exclusion.

**Aims and Hypotheses**

To our knowledge, there is only one other study that proposes and tests a mechanism through which CIU might impact the quality of close relationships (Muusses et al., 2013). The present study aims to further our understanding of the ways in which CIU affects relationship quality in two important ways. First, in contrast to existing research emphasizing the positive role of responsiveness, our article focuses on the deleterious effects a perceived lack of responsiveness has on relationship partners. Second, it focuses on a behavioral cue for perceived partner responsiveness and exclusion that has not yet been investigated, namely CIU. Thus, by researching the proposed mechanism, the results contribute to the literature on CIU and intimate relationships.

In this research, we test our prediction that perceived partner compulsive Internet use is positively related to perceived partner exclusion (H1), because the Internet can draw people’s attention away from their immediate physical and social surroundings (Wellman et al., 2001; Young & Rodgers, 1998; Yang et al., 2005). Secondly, we examine if perceived partner compulsive Internet use is negatively related to perceived partner responsiveness (H2), because compulsive Internet users are described to be less attentive and responsive to their surroundings (Meerkerk, 2007; van den Eijnden et al., 2008). We also test if perceived partner responsiveness is negatively related to perceived partner exclusion (H3), because people are sensitive to signs of exclusion (Williams, 2007), and in close relationships a lack of responsiveness should register as one of those signs (Kerr & Levine, 2008). Finally, we predict and test whether perceived partner responsiveness at least partially mediates the relationship between perceived partner compulsive Internet use and perceived partner exclusion (H4) (for an overview of the hypotheses, see Figure 1).

We tested our hypotheses in two studies. First, an online survey examined the associations between perceived partner CIU, perceived partner responsiveness and perceived partner exclusion. Secondly, in a 4-year prospective study among a large sample of married couples including 5 data-points, we examined the same associations as well as their directionality. Results from both studies contribute to our understanding of the effect of CIU on and the relation between responsiveness and exclusion in close relationships.
Study 1

To test if perceived partner CIU is positively related to perceived partner exclusion (H1), perceived partner CIU is negatively related to perceived partner responsiveness (H2), perceived partner responsiveness is negatively related to perceived partner exclusion (H3) and perceived partner responsiveness mediates the relationship between perceived partner CIU and perceived partner exclusion (H4), an online survey was conducted.

Method

Participants
The data were collected through social media and e-mail on two separate occasions (May 2013 and January 2014) by thirty undergraduate students that utilized their network to recruit participants. Of the 712 participants that started the questionnaire, 489 were included in analysis because they reported being in a relationship and that their partner had not previously filled out the questionnaire. The participants (134 males, 355 females) had an age range from 16 to 84 years (M = 27.35; SD = 11.67) and the modal highest level of education was an academic education (46.8%). Seventeen out of the 489 participants were in a homosexual relationship.

Procedure
Respondents were asked to participate in a survey by means of e-mails and messages on social networking sites. The message stated that the researchers were studying Internet use and relationships. Recipients of the message who were in a relationship were asked to participate in a survey that would take about 10 minutes of their time. Recipients of the message were also asked to forward the message to other people. The message contained a link, which led to the survey, where they were asked to fill out a questionnaire. Before measuring the main constructs, respondents were asked if they were in a relationship, and if their partner had already filled out the questionnaire. After completion of the questionnaire participants were thanked for their participation.

Materials
The data used for this study are derived from an online survey that, apart from the relevant questionnaires, also contained questions on jealousy. Only measures of interest for this research are described below. Perceived partner compulsive Internet use was assessed using a shortened adapted version of the Compulsive Internet Use Scale (CIUS; Meerkerk, van den Eijnden, Vermulst, & Garretsen, 2009). The original questionnaire consists of 14 items and has shown high reliability in previous studies and contains items about loss of control, withdrawal symptoms, conflict with regard to the use of the Internet (Meerkerk et al., 2009). We used a
5-item short version of the original 14-item CIUS scale, rated on a 5-point Likert scale (1 = not at all to 5 = very much). Item selection was based on the factor loadings reported in the three studies that Meerkerk et al. (2009) used in their scale construction. We selected the five items with the highest average loadings on the single factor that the authors found during scale construction (Meerkerk et al., 2009). The items were slightly modified because the original items were aimed at adolescents rather than at an adult population (see Kerkhof et al., 2011; Muusses et al., 2013). Specifically, we asked participants: “How often…. (1) does your partner find it difficult to stop using the Internet when he/she is online? (2) does your partner continue to use the Internet despite his/her intention to stop?, (3) does your partner prefer to use the Internet instead of spending time with others (e.g., you, children, parents, friends)? (4) is your partner short of sleep because of the Internet?, (5) does your partner feel restless, frustrated, or irritated when he/she cannot use the Internet?” (α = .84).

Perceived partner responsiveness (Kubacka et al., 2011) was assessed using an 18-item questionnaire, rated on a 5-point scale (1 = not at all to 5 = very much), that was conceptually modeled with the work of Reis and Shaver (1988). Respondents were asked to rate the degree to which they felt their partner accepts them (e.g., “My partner values and respects me”), understands them (e.g., “My partner fully understands me”), and cares for them (e.g., “My partner tries to fulfill my needs”) (α = .94).

Perceived partner exclusion (Finkenauer et al., 2009) was assessed using three items: “How often do you experience a lack of companionship in the relationship with your partner?” “How often do you feel excluded from your relationship?” and “How often do you feel separated from your partner?”. Participants rated themselves on a 5-point Likert scale (ranging from 1 = never to 5 = very often). Their responses were averaged to yield an exclusion score, with higher values indicating greater feelings of perceived partner exclusion (α = .85).

Results

Preliminary analyses
We performed preliminary analyses to explore possible moderation of the hypothesized effects by participant gender, by including participant gender and the interaction with the predictor variable in the analyses testing all possible effects. These analyses revealed few significant gender effects: One out of six possible effects involving gender was significant (p < .05). None of the three possible effects of the main variables of interest changed in direction or level of significance when adding gender. Given that only one of the associations was significantly moderated by participant gender, and given that none of the hypothesized effects changed in direction or level of significance, we dropped participant gender from the analyses.
Key analyses
To test the hypotheses, we performed a series of regression analyses. Confirming H1, the analysis showed that perceived partner compulsive Internet use was significantly related to perceived partner exclusion ($\beta = .30, p < .001, R^2 = .09$). Consistent with H2, the analyses showed that perceived partner compulsive Internet use was negatively significantly related to perceived partner responsiveness ($\beta = -.27, p < .001, R^2 = .07$). Consistent with H3, the analyses showed that perceived partner responsiveness was negatively significantly related to perceived partner exclusion ($\beta = -.56, p < .001, R^2 = .32$).

To examine whether perceived partner responsiveness mediates the effect of perceived partner CIU on perceived partner exclusion (H4), we conducted mediation analyses using the bootstrapping method (Preacher & Hayes, 2004). The bootstrap estimates are based on 5,000 bootstrap samples. The results revealed that the total effect of perceived partner compulsive Internet use on perceived partner exclusion (total effect = .26, $p < .001$) did not become non-significant when perceived partner responsiveness was included in the model (direct effect of PCIU = .15, $p < .001$). However, the analyses revealed that the total indirect effect was significant with a point estimate of .107 and a 99% confidence interval (CI) of .03-.20, confirming partial mediation. Thus, the hypothesis that perceived partner responsiveness partially mediates the relationship between perceived partner CIU and perceived partner exclusion (H4) is confirmed.

Discussion
Consistent with H1, H2, and H3, this study provides support for the idea that perceived partner CIU positively predicts perceived partner exclusion, perceived partner CIU negatively predicts perceived partner responsiveness, and perceived partner responsiveness negatively predicts perceived partner exclusion. The study showed that the association between perceived partner CIU and perceived partner exclusion is partially mediated by perceived partner responsiveness.

Study 2
Although Study 1 provided support for the hypotheses, its cross-sectional design prevents us from drawing conclusions about the directionality of the effects. Opposite directionalities are possible, for example, feeling excluded could make partners more prone to perceive the other’s Internet use as compulsive. To be able to confirm the hypothesized directionalities, Study 2 uses longitudinal data.
In Study 2 we also look at the relationship between partners’ self-reported CIU and self-reported responsiveness, to explore whether partners perceive themselves as less responsive, as a consequence of their CIU. CIU should decrease responsiveness over time, for the same reasons that perceived partner CIU should decrease perceived partner responsiveness: the
characteristics of CIU make it more difficult to be responsive to others. Subsequently, we examine the relation between self-reported CIU and perceived partner CIU. Perceived partner CIU should be driven for the most part by observations of the partner. Therefore, assuming that people are reliable at recalling their own behavior, the self-reported CIU and the perceived partner CIU are based on behaviors of the partner, and should, at least partially, converge. Because of the dyadic nature of the data, we will be able to draw conclusions about the relation between CIU and responsiveness and about the relation between CIU and perceived partner CIU, as well as the other possible relations (see Figure 2).

Finally, we strengthen the results by controlling for commitment, partner commitment, relationship adjustment, and partner relationship adjustment. These are factors that could potentially diminish the hypothesized effects because they are stabilizing factors in relationships. If results occur after controlling for these factors, this would suggest that the hypothesized relations are general effects that occur regardless of relationship strength and quality.

**Method**

**Participants**

The data used for this study are derived from the VU University Panel on Marriage and Well-Being, a 5-wave longitudinal study among married couples in the Netherlands (Finkenauer, 2006-2010). Respectively 199, 190, 190, 157, and 140 newlywed couples participated in wave 1, 2, 3, 4 and 5. The first wave of this study took place one month after marriage (for more information see Finkenauer et al., 2009; Pollmann & Finkenauer, 2009). Couples had been romantically involved on average for $5.77$ (SD = 3.07) years and had been living together for an average of $3.81$ (SD = 2.31) years. Partners’ age ranged between 25 and 40 with averages of $32.07$ (SD = 486) for husbands and $29.20$ (SD = 4.28) for wives. Nearly all the couples (98.5% of the husbands and 96.4% of the wives) were Dutch.

**Procedure**

Participants were recruited via the municipalities in which they got married. The municipalities were average sized Dutch cities. Selection criteria were that (1) for all participants this was their first marriage, (2) at the first data collection, couples had no children from this marriage or from previous relationship partners, (3) both partners were between 25 and 40 years old, and (4) couples were heterosexual. Nineteen percent of the couples that were sent a letter of invitation to participate in the study agreed to participate. This response rate is similar to other studies recruiting participants from public records in the United States (e.g., Kurdek, 1993). This study was introduced to participants as a study on the influence of personal dispositions, behavior in the relationship, and partner perception on marital wellbeing in the first years of marriage. The first wave took place in the summer of 2006, the following waves took place...
at one-year intervals. At the data collections, both members of the couple separately filled out an extensive questionnaire at home in the presence of a trained interviewer, who visited them at home. The interviewer’s presence ensured that partners independently completed the questionnaires without consulting each other. The questionnaire took about 90 minutes to complete. At each data collection, after they completed the questionnaire, couples received 15 Euros and a small gift (e.g., pen-set, gift voucher). To increase commitment, we sent birthday cards to each participant. Only scales relevant to this article are described in the following sections. For a more detailed description of the study, see studies by Finkenauer et al. (2009) and Finkenauer et al. (2010).

**Measures**

All variables were measured using the same questionnaires as in Study 1 (see above). 

*Compulsive Interne use* (CIU) was assessed in all five waves, and *perceived partner compulsive Internet use* was assessed only in waves 3, 4 and 5, using a shortened adapted version of the Compulsive Internet Use Scale (CIUS; Meerkerk et al., 2009). Therefore analyses involving CIU and perceived partner compulsive Internet use can only use wave 3, 4 and 5. CIU and perceived partner CIU had good reliability, with Cronbach’s α for CIU ranging between .61 and .85 and Cronbach’s α for perceived partner CIU ranging between .79 and .89 across waves and genders.

*Responsiveness* and *perceived partner responsiveness* was assessed in all five waves, using an 18-item questionnaire (Reis & Shaver, 1988; Kubacka et al., 2011). Responsiveness and perceived partner responsiveness had good reliability, with Cronbach’s α for responsiveness ranging between .78 and .92 and Cronbach’s α for perceived partner responsiveness ranging between .92 and .96 across waves and genders.

*Perceived partner exclusion* (Finkenauer et al., 2009) was assessed in all five waves, using three items: “How often do you experience a lack of companionship in the relationship with your partner?”, “How often do you feel excluded from your relationship?” and “How often do you feel separated from your partner?”. Partners rated themselves on a 5-point Likert scale (ranging from 1 = *never* to 5 = *very often*). Their responses were averaged to yield an *exclusion score* with higher values indicating greater feelings of perceived partner exclusion. Perceived partner exclusion had good reliability, with Cronbach’s α ranging between .73 and .90 across waves and genders.

Finally, we assessed *commitment* and *partner commitment* using the Rusbult, Martz and Agnew (1998) Scale (8 items). Commitment had good reliability, with Cronbach’s α ranging between .88 and .94 across waves and genders. We also assessed *relationship adjustment* and *partner relationship adjustment* using the Dyadic Adjustment Scale (Spanier, 1976; Spanier & Thompson, 1982; Carey, Spector, Lantinga, & Kraus, 1993) (45 items). Adjustment had good reliability, with Cronbach’s α ranging between .85 and .90 across waves and genders.
Results

Strategy of analysis
The data provided by a given participant on multiple research occasions are nonindependent, as are data from the two partners in a given relationship. Accordingly, we analyzed our data using hierarchical linear modeling (Raudenbush & Bryk, 2002). This technique accounts for the nonindependence of observations by simultaneously examining variance associated with each level of nesting, thereby providing unbiased hypothesis tests. Following recommended procedures for couples research, we represented intercept terms as random effects and represented slope terms as fixed effects (Kenny, Mannetti, Pierro, Livi, & Kashy, 2002). For the longitudinal models, we performed residualized lagged regression analyses. In these analyses we regressed each criterion variable onto the earlier predictor and the earlier measure of the criterion. Such analyses allowed us to assess how much the predictor variable account for change over time in the criterion. We performed lagged analyses, in that we simultaneously predict Time 2 criteria from Time 1 predictors, predict Time 3 criteria from Time 2 predictors, etc. Furthermore, we checked if the effect sizes of the predicted paths were significantly stronger than the ones of the reverse path. Because not all variables were measured in all five waves, the described analyses will involve the waves in which all involved variables have been measured.

Preliminary analyses
We performed preliminary analyses to explore possible moderation by participant gender, by including main effects and interaction effects for participant gender to the analyses testing all possible effects. These analyses revealed very few gender effects: Out of 20 possible main effects or interactions involving participant gender, only 5 effects were significant ($p < .05$). None of the 10 possible effects of the main variables of interest changed in direction or level of significance when adding gender as a main effect or inter-action term. Given that very few associations were significantly moderated by participant gender, none of the hypothesized effects changed in direction or level of significance, and we had no theoretical reason to suspect gender differences in our hypotheses, we dropped participant gender from the analyses. Consequently, we treated dyad members as if they were indistinguishable. Furthermore, to test the validity of our model, we tested whether it held above and beyond commitment, partner commitment, relationship adjustment and partner relationship adjustment. We did this by adding the control variables and their interactions with the predictor variable, one by one to the predicted associations and to all other possible associations. Four out of 40 possible effects changed in level of significance, but not direction. All other 36 possible effects remained the same level of significance and in their original direction while adding the control variables and the interactions. Of the four effects that changed the level of significance, only one was a hypothesized effect. Because the effect
remained in the original direction and was still marginally significant, we saw no reason to doubt the original hypotheses. Furthermore, because commitment and adjustment showed not to cloud the results, we concluded that the proposed model holds independent from relationship quality.

**Predicting key model variables cross-sectionally**

Consistent with H1, perceived partner compulsive Internet use was significantly positively related to perceived partner exclusion (β = .21, \( p < .001 \); Wave 3, 4 and 5). Consistent with H2, perceived partner compulsive Internet use was significantly negatively associated with perceived partner responsiveness (β = -.14, \( p < .001 \); Wave 3, 4 and 5). Perceived partner responsiveness was also significantly negatively related to perceived partner exclusion (β = -.48, \( p < .001 \); Wave 1, 2, 3, 4 and 5), confirming H3. To examine whether perceived partner responsiveness mediates the effect of perceived partner CIU on perceived partner exclusion, we regressed perceived partner compulsive Internet use and perceived partner responsiveness onto perceived partner exclusion. The analysis showed that the effect of perceived partner CIU on perceived partner exclusion decreased when controlling for perceived partner responsiveness: The effect of perceived partner CIU on perceived partner exclusion dropped from β = .21, \( p < .001 \) to β = .16, \( p < .001 \). The effect of perceived partner responsiveness on perceived partner exclusion remained significant (β = -.51, \( p < .001 \)) when adding perceived partner CIU. This result suggests partial mediation, which we tested by using a Sobel’s test. The Sobel’s test revealed that perceived partner responsiveness partially mediated the effects of PCIU on perceived partner exclusion (Sobel Z = 4.09, \( p < .001 \)) (H4).

**Additional analyses**

To test if CIU was associated with responsiveness, we regressed responsiveness onto CIU. This showed that CIU was negatively related to responsiveness (β = -.13, \( p < .001 \); Wave 1, 2, 3, 4 and 5), indicating that partners who reported more CIU also reported less responsiveness towards their partner. To test if CIU of partner A was associated with perceived partner CIU of partner B, we regressed partner B’s perceived partner CIU onto partner A’s CIU. This showed that partner A’s CIU was positively related to partner B’s perceived partner CIU (β = .40, \( p < .001 \); Wave 3, 4 and 5), indicating that when one partner reported more CIU, the other reported perceiving more CIU in their partner. We also tested whether partner A’s responsiveness and partner B’s perceived partner responsiveness were related. This analysis showed they were positively related (β = .17, \( p < .001 \); Wave 1, 2, 3, 4 and 5), indicating that when one partner reported more responsiveness, the other reported perceiving more responsiveness in their partner. Furthermore, we tested whether partner A’s CIU and partner B’s perceived partner responsiveness were related. This showed they were negatively related (β = -.06, \( p = .013 \); Wave 1, 2, 3, 4 and 5), indicating that when one partner reported more CIU, the other reported perceiving less responsiveness in their partner. We also tested whether partner A’s
responsiveness and partner B’s perceived partner exclusion were related. The analyses showed a negative association ($\beta = -.19, p < .001; \text{Wave 1, 2, 3, 4 and 5}$), which means that when one partner reported less responsiveness, the other reported feeling more excluded by their partner.

The associations described above provide the possibility to test for the meditational mechanisms that we proposed in our introduction. Sobel’s tests revealed that partner B’s perceived partner compulsive Internet use partially mediated the effect of partner A’s CIU on partner B’s perceived partner responsiveness (Sobel Z = -3.98, $p < .001$), partner B’s perceived partner responsiveness partially mediated the effects of partner A’s CIU on partner B’s perceived partner exclusion (Sobel Z = 2.46, $p < .015$), partner A’s responsiveness partially mediated the effects of partner A’s CIU on partner B’s perceived partner responsiveness (Sobel Z = -4.44, $p < .001$) and partner B’s perceived partner responsiveness partially mediated the effects of partner A’s Responsiveness on partner B’s perceived partner exclusion (Sobel Z = -7.03, $p < .001$). These results confirm the model as displayed in Figure 2 and suggest that partners base their perceptions on the behavior of the partner quite accurately, and that CIU is indeed related to lower responsiveness.

**Longitudinal analyses**

**Testing of the hypotheses over time**

The hypotheses confirmed H1 ($\beta = .11, p = .006, \text{Wave 3, 4 and 5}$), H2 ($\beta = -.09, p = .008; \text{Wave 3, 4 and 5}$) and H3 ($\beta = -.21, p > .001, \text{Wave 1, 2, 3, 4 and 5}$) (see Table 1). To examine whether earlier perceived partner responsiveness mediates the effect of earlier perceived partner CIU on later perceived partner exclusion, we regressed earlier perceived partner compulsive Internet use and perceived partner responsiveness onto later perceived partner exclusion. The analysis showed that the effect of earlier perceived partner CIU on later perceived partner exclusion decreased slightly when controlling for earlier perceived partner responsiveness: The effect of earlier perceived partner CIU on later perceived partner exclusion changed from $\beta = .11, p = .006$ to $\beta = .10, p = .005$. The effect of perceived partner responsiveness on perceived partner exclusion remained significant when adding perceived partner CIU ($\beta = -.23, p < .001$, for perceived partner CIU and perceived partner responsiveness respectively). This suggests a small partial mediation, which we tested by using a Sobel’s test. The Sobel’s test revealed that earlier perceived partner responsiveness partially mediated the effects of earlier perceived partner CIU on later perceived partner exclusion (Sobel Z = 2.53, $p < .02$) (H4). The effects of H1, H2 and H3 were all stronger than its reverse, meaning that the data provides support for the hypothesized directions (see Table 1).
**Additional analyses**

Again we tested the additional analyses in both directions. Earlier CIU marginally negatively predicted later Responsiveness ($\beta = -.04, p = .083$, Wave 1, 2, 3, 4 and 5), and its reverse (earlier Responsiveness predicting later CIU) was not significant ($\beta = -.01, p = .704$, Wave 3, 4 and 5). Earlier CIU positively predicted later perceived partner compulsive Internet use ($\beta = .12, p < .001$, Wave 3, 4 and 5). The effect of its reverse was, although slightly less strong, also significant, ($\beta = .10, p = .002$, Wave 3, 4 and 5). Furthermore, earlier responsiveness significantly positively predicted later perceived partner responsiveness ($\beta = .08, p < .001$, Wave 1, 2, 3, 4 and 5). The effect of its reverse was almost as strong ($\beta = .08, p = .001$, Wave 1, 2, 3, 4 and 5). Neither the effect of earlier CIU on later perceived partner responsiveness, nor the effect of the reverse direction were significant ($\beta = .01, p = .790; \beta = -.01, p = .942$, Wave 1, 2, 3, 4 and 5, respectively). Finally, earlier responsiveness negatively predicted later perceived partner exclusion in the other partner ($\beta = -.07, p = .003$, Wave 1, 2, 3, 4 and 5), but this effect was not stronger than that in the reverse direction ($\beta = -.09, p < .001$, Wave 1, 2, 3, 4 and 5). Thus, partners of people who are less responsive perceive more exclusion one year later, just as partners of people who feel more excluded report being less responsive one year later.

**Discussion**

Study 2 provides additional support for the hypotheses. Perceived partner compulsive Internet use positively predicts perceived partner exclusion. Perceived partner compulsive Internet use negatively predicts perceived partner responsiveness, which in turn negatively predicts perceived partner exclusion. Perceived partner responsiveness partially mediates the effect of perceived partner compulsive Internet use on perceived partner exclusion. Finally, Study 2 shows that the hypothesized directions are stronger than the reverse directions, thus providing support for the hypothesized directions.

**General Discussion**

The present research aimed to examine whether perceiving one’s partner’s compulsive Internet use (CIU) predicts feelings of exclusion by one’s partner and whether perceived partner responsiveness mediates the effect of perceived partner CIU on perceived partner exclusion. Consistent with our hypotheses, Study 1 demonstrated that perceived partner CIU is positively related to perceived partner exclusion (H1), perceived partner CIU is negatively related to perceived partner responsiveness (H2), and perceived partner responsiveness is negatively related to perceived partner exclusion (H3). The study also demonstrated that perceived partner responsiveness partially mediated the relation between perceived partner CIU and perceived partner exclusion (H4).
Study 2 replicated the cross-sectional results and crucially extended Study 1 by testing the hypotheses in a prospective longitudinal design. Importantly, it showed that the hypothesized directional effects were stronger than the reverse effects. Furthermore, the hypothesized effects held while controlling for indicators of relationship quality (e.g., commitment, relationship adjustment), gender, and frequency of Internet use. This suggests that these effects occur in both happy and unhappy couples, regardless of gender, and that they are driven by compulsive Internet use, not frequent Internet use.

Study 2 also showed that within individuals, self-reported CIU is indeed related to lower responsiveness to one’s partner over time. Thus, Partner A’s earlier compulsive Internet use decreases his/her responsiveness towards Partner B later. This suggests that CIU is a good gauge for others’ level of responsiveness. Finally, the study showed that people’s perception of their partner’s behavior is anchored in reality: Partner A’s earlier self-reported CIU predicts Partner B’s perception of Partner A’s level of compulsive Internet use later, just as Partner A’s earlier self-reported responsiveness predicts Partner B’s perception of Partner A’s level of responsiveness later.

**Implications**

The present research is, to our knowledge, the second study to propose, test, and confirm a mechanism through which perceived partner CIU impacts close relationships (Muusses et al., 2013). The findings indicate that people use the perception of CIU in one’s partner as a sign of exclusion. Although existing research showed that people are sensitive to cues that they are being excluded (Baumeister & Leary, 1995; Kerr & Levine, 2008; Pickett & Gardner, 2005), the suggestion that perceived partner CIU functions as one of those cues is new. It remains unclear however exactly which CIU related behavior is the cause of the perceived exclusion by the partner. The literature suggested that CIU keeps people from engaging with their kin and from paying attention to their immediate social surroundings (Meerkerk, 2007; Wellman et al., 2001). We hypothesized that this behavior may serve as a signal for exclusion, but it is also possible that other Internet-related behaviors, such as sharing more with Internet-based friends than with one’s partner, are the main signals used to perceive exclusion. Future research should examine which specific CIU related behavior makes people feel that their partner is excluding them from the relationship.

The findings also indicate that perceived partner responsiveness partially mediates the effect of perceived partner CIU on perceived partner exclusion. The literature suggested that people use their perception of certain behaviors to gauge a partner’s responsiveness (Laurenceau et al., 1998). Although the literature mostly focused on the presence of positive behaviors as a signal for perceived partner responsiveness (e.g., Kubacka et al., 2011; Laurenceau et al., 1998), the absence of positive behaviors and the presence of negative behaviors also may affect people’s perception of partner responsiveness (Finkenauer et al., 2010). The current study finds support for that notion, by showing that perceived CIU is used as a gauge for a decrease
in perceived partner responsiveness. Future research could focus on the question of whether the presence of negative behaviors (e.g., being angry or irritable) or the absence of positive behaviors (e.g., not doing one’s chores) is mostly to blame.

Furthermore, the results confirm earlier findings that suggested that unresponsiveness is used as a cue for exclusion in romantic relationships (Kerr & Levine, 2008; Maisel & Gable, 2009). The literature suggested that unresponsive behaviors would be used as cues for exclusion in social relationships (Kerr & Levine, 2008) and found that in romantic relationships, support that is perceived to be low in responsiveness decreases relationship connectedness (which can be considered the opposite of partner exclusion) (Maisel & Gable, 2009). The present research is, to our knowledge, the first to provide empirical evidence for the link between perceived partner responsiveness and perceived partner exclusion in close relationships. Exclusion and a lack of belongingness are harmful for people (Baumeister & Leary, 1995), and detection of signals of exclusion elicits feelings of pain and distress (Williams, 2007). By suggesting that in romantic relationships, perceived partner responsiveness indeed functions as a signal for exclusion, the findings of this research show that a lack of responsiveness towards one’s partner might potentially have detrimental effects on the partner.

In the present research we mostly examined the partner effects of CIU: we investigated perceived partner CIU, perceived partner responsiveness and perceived partner exclusion. In Study 2 however, we explored the effect of one’s earlier self-reported CIU on one’s later self-reported responsiveness. The results suggested that within partners, CIU decreases responsiveness towards the partner over time. We can only speculate about why compulsive Internet users become less responsive over time. One of the possibilities is that the characteristics of CIU directly affect people’s capability to be responsive: It is possible that being preoccupied with the Internet causes people to pay less attention to their offline surroundings, including their partner. Furthermore, it is possible that spending more time online decreases the amount of time spent with one’s partner, which might cause the compulsive Internet user to lose touch with the needs and concerns of their partner. Another possibility is that partners might request to cease or decrease Internet use, which might evoke negative emotions towards the partner. It is also possible that online content could affect how much effort partners want to invest in their relationship. For example, if the Internet offers many attractive alternatives (in the form of alternative partners, sexual partners, or people who react supportive when sharing personal stories) perhaps commitment and investment will decrease (Rusbult, 1983). Future research could focus on why CIU decreases responsiveness over time by studying the specific behaviors that could possibly be to blame. The outcome might also shed light on why compulsive Internet users experience a decrease in relationship quality and invest less in their relationship over time (Kerkhof et al., 2011).
Strengths and Limitations

Before concluding we should acknowledge some limitations of this research. First of all, by testing the hypotheses in a prospective longitudinal design, we were able to examine long-term directionality of the effects. However, directionality is not causality, and future research should focus on testing the hypotheses in an experimental design. Although we did not test causality of the effects, we were able to show that hypothesized direction were stronger than the reverse. Furthermore, while testing the effect of the earlier predictor variable on the later outcome variable, we controlled for the earlier score on the outcome variable, thus determining the effect of the predictor variable on the change in the outcome variable (e.g., we determined the effect of perceived partner CIU on change in perceived partner responsiveness over time).

Furthermore, it is important to note that the tested mechanisms do not explain all of the variance in the outcome variables. The suggested mediating mechanism (perceived partner responsiveness) also did not fully mediate the effect of perceived partner CIU on perceived partner exclusion. Other mechanisms might underlie this link. For example, previous research showed that over time, compulsive Internet users disclose less and conceal more in their relationship (Kerkhof et al., 2011). Perceived concealment has been found to contribute to feelings of exclusion in marital relationships (Finkenauer et al., 2009). Thus, if it is the case that partners notice concealment, this too might affect feelings of being excluded.

While the present research focused on romantic relationships, it remains unclear whether the proposed mechanism is at play in other types of relationships as well. Given that responsiveness is one of the key ingredients of almost all close relationships (Reis et al., 2004), we expect that the effects observed in the current research may replicate in other types of close relationships, such as friendships or dating relationships.

Several strengths of this research should also be acknowledged. First, we tested and replicated the hypothesized effects in two studies using diverse research methods and different samples. By using a longitudinal design among both partners of married couples, we were able to examine long-term effects, as well as directionality. Importantly, the dyadic nature of Study 2 made it possible to chart both the effects for the partner of the compulsive Internet user, and the effects for the compulsive Internet user him/herself. It thereby sheds a unique light on the relational implications CIU has for partners in relationships and their relationship with each other. Finally, we controlled for several confounds and factors that might be of influence on the predicted relations, ruling out effects of Internet frequency and relationship quality and gender effects as alternative explanations for the results.

Conclusions

Perceived partner exclusion is a serious threat to people’s need for belongingness with their partner, and people use different cues to detect signs of perceived partner exclusion. The present work illuminates one behavioral cue that people use to detect exclusion by their
partner: perceived partner CIU. Two studies supported the hypothesis that people use their perception of their partner’s CIU as a cue for being excluded by their partner. The studies also supported the hypothesis that perceived partner responsiveness partially mediates this effect: The perception of one’s partner’s CIU leads to a decrease in perceived partner responsiveness, which in turn is used as a cue for exclusion by their partner.

Table 1

Residualized lagged analyses β’s for the predicted change in the later dependent variable by the earlier criterion variable, while controlled for the earlier dependent variable, and the reverse directions

<table>
<thead>
<tr>
<th>Criterion → Dependent variable</th>
<th>Stability of the dependent variable over time</th>
<th>Effect of criterion on change in dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPCIU → PPR</td>
<td>.72**</td>
<td>-.09**</td>
</tr>
<tr>
<td>PPR → PPE</td>
<td>.40**</td>
<td>-.21**</td>
</tr>
<tr>
<td>PPCIU → PPE</td>
<td>.56**</td>
<td>.11**</td>
</tr>
<tr>
<td>PPCIU and PPR → PPE</td>
<td>.46**</td>
<td>.10** and -.23**</td>
</tr>
</tbody>
</table>

Reverse directions

<table>
<thead>
<tr>
<th></th>
<th>Stability of the dependent variable over time</th>
<th>Effect of criterion on change in dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPR → PPCIU</td>
<td>.78**</td>
<td>-.01</td>
</tr>
<tr>
<td>PPE → PPR</td>
<td>.59**</td>
<td>-.11**</td>
</tr>
<tr>
<td>PPE → PPCIU</td>
<td>.76**</td>
<td>.04</td>
</tr>
</tbody>
</table>

Note: *p < .05, **p < .01.
Note: PPCIU = perceived partner compulsive Internet use; PPR = perceived partner responsiveness; PPE = perceived partner exclusion.

Figure 1

Process model of the hypothesized relationships
Figure 2

Process model of the hypothesized relationships and possible cross-partner and other relationships