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Suicide and Life-Threatening BEHAVIOR

ORIGINAL ARTICLE

Perceived responsiveness in suicidal ideation: An experience sampling study in psychiatric patients

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Abstract

Introduction: Perceived responsiveness, or the extent to which one feels understood, validated and cared for by close others, plays a crucial role in people's well-being. Can this interpersonal process also protect people at risk? We assessed whether fluctuations in suicidal ideation were associated with fluctuations in the degree of perceived responsiveness that psychiatric patients (admitted in the context of suicide or indicating suicidal ideation) experienced in daily interactions immediately after discharge.

Methods: Fifty-seven patients reported on suicidal ideation (5 times a day) and perceived responsiveness (daily) for four consecutive weeks. The effects of established risk factors—thwarted belongingness, perceived burdensomeness, and hopelessness—were assessed as well.

Results: The more patients felt that close others had been responsive to them, the less suicidal ideation they reported. At low levels of thwarted belongingness, perceived burdensomeness, or hopelessness, perceived responsiveness seemed to play a protective role, negatively co-occurring with suicidal ideation. When thwarted belongingness, perceived burdensomeness, and hopelessness were high, perceived responsiveness did not have an effect.

Conclusion: Perceived responsiveness could be a protective factor for suicidal ideation for people at risk only when they are experiencing low levels of negative perceptions. When experiencing highly negative perceptions, however, perceived responsiveness seems to matter less.

KEYWORDS

hopelessness, interpersonal theory of suicide, perceived responsiveness, suicidal ideation, suicidal thoughts

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INTRODUCTION

Suicide is one of the leading causes of death worldwide (WHO, 2019). A better understanding of suicidal ideation, which is likely to result in a better ability to predict and prevent suicide, is therefore of global concern. Suicidal ideation is more common than suicidal behavior, and one of the most important predictors of death by suicide (Jobes & Joiner, 2019; Ribeiro et al., 2016). Despite centuries of scientific research on the topic, however, the understanding of suicidal ideation remains surprisingly limited (Nock et al., 2019).

Identifying proximal factors that predict changes in suicidal ideation is deemed crucial to advance existing knowledge (Kleiman & Nock, 2018). Suicidal ideations fluctuate within hours and days, and can escalate quickly (e.g., Kleiman et al., 2017). Consequently, knowledge about predictors of short-term change is necessary for effective prevention and intervention. Fortunately, recent advancements in technology and statistical methods have prompted an increase of research on suicidal ideation and predictors (for an overview, see e.g., Gee et al., 2020).

The link between interpersonal problems and suicidal ideation is well-established, and one of the most influential theories of suicide posits a central role to it (Van Orden et al., 2010). Specifically, the Interpersonal Theory of Suicide states that suicidal ideation is caused by the simultaneous presence of two interpersonal constructs: thwarted belongingness and perceived burdensomeness. Thwarted belongingness is a multidimensional construct that describes the experience of alienation from others, encompassing loneliness and the absence of reciprocal care (relationships in which individuals both feel cared about and demonstrate care of another). Perceived burdensomeness describes the experience of having the feeling that one's existence is a burden on others, encompassing self-hate and feelings of liability. Both are expected to be impacted by inter- and intra-personal factors such as family conflict, living alone, and lacking social support. Besides these two core interpersonal risk factors, a general sense of hopelessness is seen as a main depressive feature accentuating suicidal ideation (Beck et al., 1993). By now, thwarted belongingness (and its key factor loneliness; Kleiman et al., 2017), perceived burdensomeness, and hopelessness have been linked to increases in suicidal ideation, showing small-to-moderate effect sizes (for an overview, see Gee et al., 2020).

Empirical research on the specific interpersonal processes that might feed into or protect against thwarted belongingness and perceived burdensomeness, which are more generalized interpersonal perceptions, is currently missing. Such dynamic, interactional processes have received much less attention, while they would help to understand the circumstances under which interpersonal perceptions might improve or worsen suicidal ideations. A better conceptual understanding of such processes would enhance clinical utility as specific interactional processes could be explicitly targeted, and therapists and close others could be trained. Many empirical studies of suicidal ideation focus on risk factors, while neglecting protective factors (Franklin et al., 2017). Proximal protective factors—that is, factors that buffer immediate increases in suicidal ideation—have been largely overlooked (for important exceptions, see Coppersmith et al., 2019; Husky et al., 2017). However, those factors could be of paramount importance for suicide prevention and intervention as they represent immediate, modifiable factors that can decrease risk (e.g., Berman & Silverman, 2020; Glenn & Nock, 2014).

Therefore, we investigated the role of perceived responsiveness as a proximal protective factor for suicidal ideation. Perceived responsiveness is the active ingredient that underlies satisfying, healthy relationships (Reis & Le, 2022). It is the result of an interactional process through which individuals come to believe that close others attend to, respect, and support core aspects of their selves, such as their needs, goals, and welfare (Reis et al., 2004). Specifically, it reflects the degree to which people feel understood, validated, and cared for by close others during interactions, and in this way, is constitutive for the establishment of intimacy (Laurenceau et al., 1998) and supportive relationships (Maisel & Gable, 2009). Perceived responsiveness is thus a core feature of the quality of relationships and relational functioning (Reis & Le, 2022). Next to interpersonal outcomes, perceived responsiveness has been shown to predict a host of individual outcomes such as better emotional well-being (Selcuk & Karagobek, 2018), better physical functioning (Wilson et al., 2017), less pain (O'Neill et al., 2020), better stress responses regulation (Dooley et al., 2018; Kane et al., 2019), and better physiological markers of stress such as sleep quality (Selcuk et al., 2017) or cortisol reactivity (Slatcher et al., 2015).

For a better understanding of the interpersonal logic of suicide risk factors, these conceptualizations and findings from relationship research seem to be highly relevant, yet have not been integrated into clinical research. When individuals disclose personally relevant information to close others, such as important feelings, thoughts, or concerns, perceived responsiveness matters, indicating whether the close other's response has been experienced as thoughtful and caring, or, alternatively, disinterested or rejecting. The quality of the close interactions one experiences might therefore activate or deactivate perceptions of thwarted belongingness and perceived burdensomeness. Specifically, perceiving responsiveness from close others

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might work to disconfirm more general cognitive-affective states of social isolation and perceptions that nobody cares about oneself (thwarted belongingness) or that one is a liability to others (perceived burdensomeness). With regard to the latter, perceived responsiveness has been shown to lower threats to self-worth such as defensive reactions to failures (Caprariello & Reis, 2011) and self-concept threat (Reis et al., 2018).

In addition to affecting suicidal ideation by impacting thwarted belongingness and perceived burdensomeness, perceived responsiveness might impact suicidal ideation through its stress regulating effects. Having close others react responsively to one's stressful circumstances and needs may counteract the potential detrimental impact of daily life stressors, which might otherwise contribute to worsening of suicidal ideation in vulnerable individuals (Kleiman et al., 2018). This reasoning also aligns with recent findings on negative associations between suicidal ideation and social support (Coppersmith et al., 2019), which is related to perceived responsiveness (but not the same, see e.g., Maisel & Gable, 2009).

In short, we build upon the emerging research on the role of interpersonal processes in suicidal ideation (i.e., interpersonal perceptions and social support; Coppersmith et al., 2019; Kaurin et al., 2020) by investigating perceived responsiveness and its interplay with thwarted belongingness, perceived burdensomeness, and hopelessness in high-risk individuals. We investigate psychiatric patients post-discharge who had been admitted to a psychiatric hospital in the context of suicidal ideation or a suicidal attempt, or who had expressed suicidal ideations during their intake. The experience sampling design started immediately after individuals were discharged, capturing an especially high-risk period in which increases in suicidal ideation and behavior often occur (Valenstein et al., 2009). To our knowledge, this is the first study to investigate how interpersonal risk and protective factors interact in predicting suicidal ideation as assessed in patients' daily lives. We aimed to answer two questions: (1) Are changes in perceived responsiveness associated with changes in suicidal ideation? (2) How do perceived responsiveness and three established risk factors (thwarted belongingness, perceived burdensomeness, and hopelessness) interact in predicting suicidal ideation?

METHOD

Participants and procedure

Participants were recruited from the Psychiatric University Hospital Zurich, Switzerland. Specific inclusion criteria were as follows: (1) admission to the hospital after a suicide attempt or in the context of suicidal ideation, and/or suicidal ideation being identified in the first diagnostic intake interview, (2) sufficient knowledge of the German language, (3) having a smartphone, and (4) discharge in accord with a clinician, with established outpatient care.

A total of 1088 patients was screened, of which the majority did not comply or expressed no interest in participation, resulting in a sample of 88 eligible patients who provided written consent to participate. The final sample consisted of 57 participants with valid ESM data. For participants for whom we had background information, the average age was 35 (SD = 12.27, range = 18–57). Sixty-two percent identified as female and 38% as male. About half of the participants identified as single (52%), 27% was in a relationship, but living alone, and 21% was cohabiting/married. The majority was Swiss (82.09%).

The study consisted of a baseline assessment, a 4-week period of ecological momentary assessment consisting of experience sampling methodology (ESM) and passive mobile sensing, and a follow-up. The ESM-part started immediately after hospital discharge. Participants were prompted five times a day for 4 weeks (for more details on the prompting schedule, see Sels et al., 2021). Although compliance was promoted through several strategies, it was low (31%, with an SD of 26%). From the 140 beeps that participants received, on average, 43 beeps were answered per person (SD = 36, Min = 1, Max = 129), with most participants answering 5 to 9 beeps in total. Participants received 30 CHF for study participation.

Measures

Table 1 reports the descriptive statistics for the key variables and within- and between-person correlations. Multilevel reliabilities are reported for each measurement and calculated by the function omegaSEM, using multilevel structural equation modeling (Geldhof et al., 2014).

Suicidal ideations were assessed at each beep (five times a day) by four validated items (Forkmann et al., 2018). Two items assessed active suicidal ideation: "At the moment, I want to die by suicide" and "At the moment, I think about taking my life." Two items assessed passive suicidal ideation: "At the moment, I feel that life is not worth living." and "At the moment, I have more reasons to die than to live." Participants indicated their agreement with the items on a slider scale ranging from "not at all" (recoded into 0) to "extremely" (100). Of those, a mean score was computed ($\Omega_{with} = 0.86$, $\Omega_{betw} = 0.96$).

Perceived responsiveness was assessed once per day. Each evening, participants indicated with whom they had spent most time, answering three items by indicating agreement

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TABLE 1 Descriptive statistics for key variables.

Variable	*M*	SD_{wp}	SD_{bp}	ICC	SI	PR	TB	PB	H
Suicidal ideation (SI)	26.58	11.14	23.66	0.78	–	−0.22	0.67	0.74	0.77
Perceived responsiveness (PR)	69.20	12.76	14.35	0.33	−0.1	–	−0.25	−032	−0.29
Thwarted belongingness (TB)	41.71	14.61	24.85	0.62	0.53	−0.2	–	0.85	0.88
Perceived burdensomeness (PB)	44.20	14.57	25.20	0.67	0.55	−0.2	0.63	–	0.94
Hopelessness (H)	44.51	16.08	26.80	0.60	0.57	−0.14	0.69	0.69	–

Note: Between-person correlations are shown above the diagonal; average within-person correlations are shown below the diagonal. wp, within-persons; bp, between-persons; ranges of all variables: 0–100.

on the slider scales ("not at all" to "fully," recoded from 0 to 100). These items assessed the three components of perceived responsiveness: perceived understanding ("To what extent did you feel that this person understood you?"), validation ("To what degree did you feel that this person valued your abilities and opinions?"), and care ("To what degree did you feel that this person expressed liking and encouragement for you?") (Gadassi et al., 2016). Of those, a mean score was computed ($\Omega_{with} = 0.88$, $\Omega_{betw} = 0.98$).

Thwarted belongingness was assessed at each beep with two validated items (Forkmann et al., 2018) on a slider scale ("not at all" to "extremely," recoded from 0 to 100): "At this moment, I feel lonely" and "At this moment, I feel like I do not belong." Of those, a mean score was computed ($\Omega_{with} = 0.72$, $\Omega_{betw} = 0.88$).

Perceived burdensomeness was assessed at each beep with two validated items (Forkmann et al., 2018) on a slider scale ("not at all"—"extremely", recoded from 0 to 100): "At this moment, I feel like a burden for others" and "At this moment, I feel useless." Of those, a mean score was computed ($\Omega_{with} = 0.83$, $\Omega_{betw} = 0.96$).

Hopelessness was assessed at each beep with the item "At this moment, I feel hopeless," which was answered on a slider scale ("not at all"—"extremely", recoded from 0 to 100) (Kleiman et al., 2017).

Data analyses

These data have a three-level structure: Repeated measurements (Level 1) are nested within days (Level 2) within individuals (Level 3). This structure is considered by applying multilevel analyses. Empty three-level models provided insight into the relative magnitude of between-person variability and within-person variability (at a day and momentary level) over time, showing that variation at the day and within person level were significant. Perceived responsiveness was measured at a day level only, and we brought this variable to the momentary level by replicating it, in this way avoiding a loss of data. We omitted days in which participants reported not to have interacted with someone close. For comparison, we conducted analyses on the day level, aggregating the momentary variables across days, which led to similar results. All analyses for which statistics are not reported in the manuscript, can be found on https://osf.io/uwdb9/ in the Rmarkdown file "analyses."

Because we were interested in within-person associations, time-variant predictors were person-centered. Person-means of the predictors were also included in the models to completely rule out between-person associations. We allowed errors to be correlated over time, and used random intercepts and fixed slopes. In first analyses, we also set random slopes for individuals, but as these analyses did not converge (also not after taking several steps to improve convergence), the random effect structure was simplified. All analyses were conducted in R, and we used the nlme (Pinheiro et al., 2013) package for multilevel modeling.

First, we investigated whether changes in perceived responsiveness were associated with changes in suicidal ideation, and next, we investigated interactions between perceived responsiveness and the three established risk factors (thwarted belongingness, perceived burdensomeness, and hopelessness). The hypotheses and data-analytic plan for this study were preregistered on https://osf.io/5famv/. There were some small deviations from this preregistration, which are described in the Appendix S1.[i]

RESULTS

Because low participant compliance could bias the estimated models, we first investigated potential predictors of momentary compliance, using a similar procedure to Rintala et al. (2020). If predictors explained momentary compliance, they were added as control variables in statistical models. In a multilevel mixed-effect logistic regression model, we included participants' age, sex (0 = female, 1 = male), Beck Scale for Suicide Ideation (BSS) and Beck's Depression Inventory (BDI) scores, and day number as level 2 predictors of momentary compliance (0 = missed observation, 1 = fulfilled observation). We allowed the intercept to vary over participants. Results showed that only

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sex ($b = -1.39$, SE = 0.45, $p = 0.002$, 95% CI [−2.28, −0.50]) and day number ($b = -0.10$, SE = 0.00, $p < 0.001$, 95% CI [−0.11, −0.09]) predicted lower probability of answering the actual survey. In a second model, we lagged reported suicidal ideation to investigate whether it was a momentary predictor to compliance. Results showed that suicidal ideation was not associated to momentary compliance ($b = 0.00$, SE = 0.00, $p = 0.377$, 95% CI [−0.01, 0.00]). Based on those results, we decided to only include sex as a control variable in the following models by including it as a dummy variable. We did not include day number as it is already taken into account in the multilevel structure of the next models.

Next, we investigated whether perceived responsiveness was associated with suicidal ideation over time by including daily perceived responsiveness as a predictor for momentary suicidal ideation. We found that perceived responsiveness was negatively associated with suicidal ideation ($b = -0.08$, SE = 0.03, $p = 0.01$, 95% CI [−0.14, −0.02]). This means that the more participants felt that close others had been responsive to them that day, the less momentary suicidal ideation they reported.

Consecutively, we investigated how perceived responsiveness interacted with perceived burdensomeness, thwarted belongingness, and hopelessness, by adding each variable as a main and interaction effect in separate models. Because these three risk factors correlated highly (Table 1) and revealed similar results, we only report the exact results for perceived burdensomeness here (Table 2 and Figure 1). Results for the other risk factors can be found on https://osf.io/uwdb9/ in the Rmarkdown file "analyses."

Each risk factor significantly predicted suicidal ideation, and significantly interacted with perceived responsiveness, whose main effect disappeared. For example, the main effect of perceived responsiveness on suicidal ideation diminished, but there was a strong positive interaction effect between perceived responsiveness and perceived burdensomeness. This means that the effect of perceived responsiveness on suicidal ideation depended on the level of perceived burdensomeness participants experienced. Simple slope analyses revealed that the association between perceived responsiveness and suicidal ideation mattered only at low levels of perceived burdensomeness (low perceived burdensomeness: $b = -0.11$, SE = 0.03, $p < 0.001$, 95% CI [−0.16, −0.00], for high perceived burdensomeness: $b = 0.01$, SE = 0.03, $p = 0.58$, 95% CI [−0.04, 0.07]). As can be seen in Figure 1, when people did not feel like a burden toward others, suicidal ideation was impacted by the extent to which people felt that close others had been responsive to them. However, when perceived burdensomeness was high, there was no significant relationship between perceived responsiveness and suicidal ideation.

We conducted a series of ancillary tests to look for artifacts and confounders, but none were found.

DISCUSSION

This study builds on and substantially extends existing research by investigating the role of perceived responsiveness in momentary suicidal ideation. Importantly, the observed effects of perceived responsiveness on suicidal ideation were overwritten by the effects of more general, established interpersonal risk factors. Specifically, more daily perceived responsiveness was associated with less momentary suicidal ideation, but this relationship was moderated by the levels of thwarted belongingness/perceived burdensomeness/hopelessness that participants reported to experience. At low levels of thwarted belongingness, perceived burdensomeness or hopelessness, perceived responsiveness seemed to play a protective role. This means that the more participants felt that close others had been responsive to them that day, the less suicidal ideation they reported. When thwarted belongingness, perceived burdensomeness and hopelessness were high, perceived responsiveness did not matter. Consistent with the previous research, thwarted belongingness, perceived burdensomeness, and hopelessness each positively predicted suicidal ideation (e.g., Hallensleben et al., 2019; Kleiman et al., 2017; Kyron et al., 2018). Here, we show

TABLE 2 Model predicting suicidal ideation by perceived burdensomeness, perceived responsiveness, and their interaction.

Model for perceived burdensomeness			
Predictors	***B* (SE)**	**95% CI**	***p***
Intercept	−10.07 (13.99)	−37.53 to 17.39	0.472
Perceived burdensomeness	0.29 (0.02)	0.26 to 0.32	**<0.001**
Perceived responsiveness	−0.05 (0.02)	−0.09 to 0.00	0.070
Perceived responsiveness*perceived burdensomeness	0.00 (0.00)	0.00 to 0.01	**<0.001**
Person-mean perceived burdensomeness	0.67 (0.10)	0.48 to 0.86	**<0.001**
Person-mean perceived responsiveness	0.09 (0.17)	−0.26 to 0.44	0.608
Sex	−2.97 (5.08)	−13.19 to 7.26	0.562

Note: *p* values < 0.001 should be indicated as bold.

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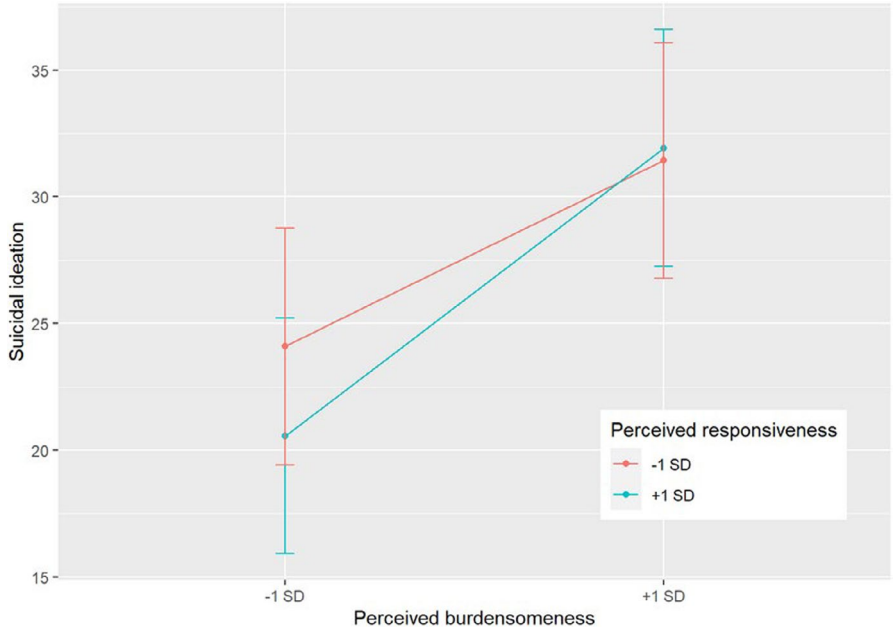


FIGURE 1 Interaction effects of perceived burdensomeness with perceived responsiveness on suicidal ideation. The figure shows associations between perceived burdensomeness and suicidal ideation and the moderation of this effect by perceived responsiveness, showing no differences in the magnitude of suicidal ideation under high levels of perceived burdensomeness (where suicidal ideation was equally high in those with higher and lower perceived responsiveness) and smaller suicidal ideation in those with lower perceived burdensomeness when scoring higher on perceived responsiveness. Lines represent the simple slopes of low (red; −1 SD) and high (blue; +1 SD) perceived responsiveness, at low (−1 SD) and high (+1 SD) perceived burdensomeness. The error bars represent the confidence intervals of the predicted means.

that being in high states of these risk factors also diminish the effects of close, social connections as indicated by perceived responsiveness on suicidal ideation.

The disappearance of the main effect of perceived responsiveness when controlling for the established risk factors might be explained by the shared conceptual overlap between these factors and perceived responsiveness. Just like perceived responsiveness, the risk factors thwarted belongingness, perceived burdensomeness, and hopelessness are interpersonal, and include perceptions about the quality of people's social bonds. In fact, we hypothesized that the effects of perceived responsiveness would partly take place by activating perceptions of thwarted belongingness, perceived burdensomeness, and hopelessness. These risk factors are also suicide-specific, in contrast to the construct of perceived responsiveness, and it therefore logically follows that they are more immediately predictive of suicidal intention when looked at together.

Although perceived responsiveness and its importance for well-being has been clearly established (Canevello & Crocker, 2010), its role in clinical samples remains under researched, and to our knowledge, has not been investigated in samples with suicidal ideation yet. Understanding whether and how the importance of perceived responsiveness transfers to clinical samples, is important to know theoretically and clinically (see also Milner et al., 2020). What is it precisely about social bonds that matter for suicidal ideation? Additionally, could our investigation identify new targets for improving it in interventions, at least in a subgroup of patients? Negative perceptions such as thwarted belongingness fluctuate, and perceiving responsive support in interactions seems helpful for reducing suicidal ideation in high-risk individuals when negative perceptions are not triggered. This changes when these negative perceptions are triggered, and highly accessible to individuals.

Indeed, results of this study might help to explain why not only people without any social bonds, but also people in loving relationships with close, supportive bonds, are experiencing suicidal impulses. In moments when their negative perceptions are too high, attention might better be dedicated to perceptions of being a burden, not belonging to these people, and hopelessness, and the situations that trigger the states associated with these perceptions rather than attending to and working on interactional processes of close others, or perceptions of these, such as reminding the suicidal person of their loved ones and how much they care. This is consistent with the role of perceived social disconnection in suicidality (Van Orden et al., 2010) and also relates to research showing how cognitive biases can be triggered by negative moods and stressors, in this way maintaining depression (e.g., Hallion & Ruscio, 2011). Another explanation is that people who

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are high on these risk factors, do not report perceived responsiveness in their interactions anymore. However, this explanation is not likely, as perceived responsiveness correlated with these risk factors, but also showed substantial differential validity (effect sizes were small). Further, descriptive plots (see https://osf.io/uwdb9/) showed considerable variability and no clear patterns.

This study had some limitations. First, being part of a larger study on suicidal ideation, perceived responsiveness was only assessed daily instead of multiple times a day such as the momentary variables. This means that the momentary variables had more variance, and thus more power to detect effects. This could be an alternative explanation for the stronger effects that were found for thwarted belongingness, perceived burdensomeness, and hopelessness. Also conceptually, perceived responsiveness is likely to fluctuate for each interaction with each specific person, while participants were asked once daily about their interactions throughout the day with the person with whom they had spent most time. Further research is needed with a more fine-grained assessment of perceived responsiveness together with more specific assessments of relationship type and quality with the interaction partners. Second, although the study population is a hard-to-reach population, and the obtained sample is larger than or in line with previous studies, the large number of missing data points might have limited the power to detect effects below a certain magnitude, and prevented further predictive analyses. The predictive analyses resulted in a loss of 18 participants and 1/3th of the observations, which meant not only a loss of power, but also investigating a different sample in both set of analyses. Therefore, we decided to omit these analyses. However, given the correlational design and the focus on same-moment associations, no causal inferences are possible. To better understand the temporal dynamics and underlying processes of perceived responsiveness, larger studies with more observations per participant are needed. Third, as in most suicidal risk research, the self-selection of participants, the compliance, and drop-out are likely to be related to key variables such as suicidal ideation severity, which limits generalizability. However, missingness analyses showed that momentary suicidal ideation did not predict if participants missed the survey the next moment.

Taken together, this is the first study investigating the role of perceived responsiveness as a protective factor for suicidal ideation in a high-risk sample. Our results suggest that perceived responsiveness might be a time-varying protective factor for suicidal ideation that interacts with more general interpersonal risk factors in that its effects are visible in moments that these risk factors are low. Because of the important theoretical and clinical implications of these findings for suicide prevention and just-in-time interventions, future investigation is warranted.

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CONFLICT OF INTEREST STATEMENT

One of the co-authors (Tobias Kowatsch; TK) is affiliated with the Centre for Digital Health Interventions (CDHI), a joint initiative of the Institute for Implementation Science in Health Care, University of Zurich, the Department of Management Technology, and Economics at ETH Zurich, and the Institute of Technology Management and School of Medicine at the University of St.Gallen. CDHI is funded in part by CSS, a Swiss health insurer. TK is also a co-founder of Pathmate Technologies, a university spin-off company that creates and delivers digital clinical pathways. However, neither CSS nor Pathmate Technologies were involved in this research. There are no other interests to declare.

DATA AVAILABILITY STATEMENT

This dataset is part of a larger study and detailed information can be found in the published protocol (Sels et al., 2021). Unrelated questions have been investigated, of which the resulting publications can be found on https://osf.io/uwdb9/. This OSF link also contains relevant code and data to conduct the reported analyses. The hypotheses and data-analytic plan of this study were preregistered on https://osf.io/rgzy9. A preprint of this manuscript is published on https://psyarxiv.com/9xzds/.

ETHICS STATEMENT

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human subjects/patients were approved by the Ethics Committee of the Faculty of Arts and Social Sciences of the University of Zurich.

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ENDNOTE

[i] In this preregistration, we planned to investigate both concurrent and predictive associations (does perceived responsiveness at time *t*−1 predict suicidal ideation at time *t*). However, the predictive analyses resulted in a loss of 18 participants and 1/3th of the observations, which meant not only a loss of power, but also investigating a different sample in both set of analyses. Therefore, we decided to omit these analyses.

REFERENCES

Beck, A. T., Steer, R. A., Beck, J. S., & Newman, C. F. (1993). Hopelessness, depression, suicidal ideation, and clinical diagnosis of depression. *Suicide & Life-Threatening Behavior*, *23*(2), 139–145. https://doi.org/10.1111/j.1943-278X.1993.tb00378.x

Berman, A. L., & Silverman, M. M. (2020). Near term suicide risk assessment: A commentary on the clinical relevance of protective factors. *Archives of Suicide Research*, *24*(S2), S370–S380.

Canevello, A., & Crocker, J. (2010). Creating good relationships: Responsiveness, relationship quality, and interpersonal goals. *Journal of Personality and Social Psychology*, *99*(1), 78–106. https://doi.org/10.1037/a0018186

Caprariello, P. A., & Reis, H. T. (2011). Perceived partner responsiveness minimizes defensive reactions to failure. *Social Psychological and Personality Science*, *2*(4), 365–372. https://doi.org/10.1177/1948550610391914

Coppersmith, D., Kleiman, E. M., Glenn, C. R., Millner, A. J., & Nock, M. K. (2019). The dynamics of social support among suicide attempters: A smartphone-based daily diary study. *Behaviour Research and Therapy*, *120*, 103348. https://doi.org/10.1016/j.brat.2018.11.016

Dooley, M. K., Sweeny, K., Howell, J. L., & Reynolds, C. A. (2018). Perceptions of romantic partners' responsiveness during a period of stressful uncertainty. *Journal of Personality and Social Psychology*, *115*(4), 667–687. https://doi.org/10.1037/pspi0000134

Forkmann, T., Spangenberg, L., Rath, D., Hallensleben, N., Hegerl, U., Kersting, A., & Glaesmer, H. (2018). Assessing suicidality in real time: A psychometic evaluation of self-report items for the assessment of suicidal ideation and its proximal risk factors using ecological momentary assessments. *Journal of Abnormal Psychology*, *127*(8), 758–769. https://doi.org/10.1037/abn0000381

Franklin, J. C., Ribeiro, J., Fox, K. R., Bentley, K. H., Kleiman, E. M., Huang, X., & Nock, M. K. (2017). Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. *Psychological Bulletin*, *143*, 187–232. https://doi.org/10.1037/bul0000084

Gadassi, R., Bar-Nahum, L. E., Newhouse, S., Anderson, R., Heiman, J. R., Rafaeli, E., & Janssen, E. (2016). Perceived partner responsiveness mediates the association between sexual and marital satisfaction: A daily diary study in newlywed couples. *Archives of Sexual Behavior*, *45*(1), 109–120.

Gee, B. L., Han, J., Benassi, H., & Batterham, P. J. (2020). Suicidal thoughts, suicidal behaviours and self-harm in daily life: A systematic review of ecological momentary assessment sudies. *DIGITAL HEALTH*, *6*, 1–38. https://doi.org/10.1177/2055207620963958

Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods*, *19*(1), 72–91. https://doi.org/10.1037/a0032138

Glenn, C. R., & Nock, M. K. (2014). Improving the short-term prediction of suicidal behavior. *American Journal of Preventive Medicine*, *47*(3), S176–S180. https://doi.org/10.1016/j.amepre.2014.06.004

Hallensleben, N., Glaesmer, H., Forkmann, T., Rath, D., Strauss, M., Kersting, A., & Spangenberg, L. (2019). Predicting suicidal ideation by interpersonal variables, hopelessness, and depression in real-time. An ecological momentary assessment study in psychiatric inpatients with depression. *European Psychiatry*, *56*, 43–50. https://doi.org/10.1016/j.eurpsy.2018.11.003

Hallion, L. S., & Ruscio, A. M. (2011). A meta-analysis of the effect of cognitive bias modification on anxiety and depression. *Psychological Bulletin*, *137*(6), 940–958. https://doi.org/10.1037/a0024355

Husky, M., Swendsen, J., Ionita, A., Jaussent, I., Genty, C., & Courtet, P. (2017). Predictors of daily life suicidal ideation in adults recently discharged after a serious suicide attempt: A pilot study. *Psychiatry Research*, *256*, 79–84. https://doi.org/10.1016/j.psychres.2017.06.035

Jobes, D. A., & Joiner, T. E. (2019). Reflections on suicidal ideation. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, *40*(4), 227–230. https://doi.org/10.1027/0227-5910/a000615

Kane, H. S., Wiley, J. F., Dunkel, C. S., & Robles, T. F. (2019). The effects of interpersonal emotional expression, partner responsiveness, and emotional approach coping on stress responses. *Emotion*, *19*, 1315–1328. https://doi.org/10.1037/emo0000487

Kaurin, A., Dombrovski, A. Y., Hallquist, M., & Wright, A. G. (2020). Momentary interpersonal processes of suicidal surges in borderline personality disorder. *Psychological Medicine*, *52*, 2702–2712. https://doi.org/10.1017/S0033291720004791

Kleiman, E. M., Fedor, S., Turner, B. J., Beale, E. E., & Huffman, J. C. (2017). Examination of real-time fluctuations in suicidal ideation and its risk factors: Results from two ecological momentary assessment studies. *Journal of Abnormal Psychology*, *26*(6), 726–738. https://doi.org/10.1037/abn0000273

Kleiman, E. M., & Nock, M. K. (2018). Real-time assessment of suicidal thoughts and behavior. *Current Opinion in Psychology*, *22*, 33–37. https://doi.org/10.1016/j.copsyc.2017.07.026

Kleiman, E. M., Turner, B. J., Chapman, A. L., & Nock, M. K. (2018). Fatigue moderates the relationship between perceived stress and suicidal ideation: Evidence from two high-resolution studies. *Journal of Clinical Child & Adolescent Psychology*, *47*(1), 116–130.

Kyron, M. J., Hooke, G. R., & Page, A. C. (2018). Daily assessment of interpersonal factors to predict suicidal ideation and non-suicidal self-injury in psychiatric inpatients. *Journal of Consulting and Clinical Psychology*, *86*(6), 556–567. https://doi.org/10.1037/ccp0000305

Laurenceau, J.-P., Paula, R. P., & Barrett, L. F. (1998). Intimacy as an interpersonal process: The importance of self-disclosure, partner disclosure, and perceived partner responsiveness in

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interpersonal exchanges. *Journal of Personality and Social Psychology*, *74*(5), 1238–1251.

Maisel, N. C., & Gable, S. L. (2009). The paradox of received social support: The importance of responsiveness. *Psychological Science*, *20*(8), 928–932. https://doi.org/10.1111/j.1467-9280.2009.02388

Milner, A. J., Robinaugh, D. J., & Nock, M. K. (2020). Advancing the understanding of suicide: The need for formal theory and rigorous descriptive research. *Trends in Cognitive Sciences*, *24*(9), 704–716. https://doi.org/10.1016/j.tics.2020.06.007

Nock, M. K., Ramirez, F., & Rankin, O. (2019). Advancing our understanding of the who, when, and why of suicide risk. *JAMA Psychiatry*, *76*(1), 11–12. https://doi.org/10.1001/jamapsychiatry.2018.3164

O'Neill, A. S., Mohr, C. D., Bodner, T. E., & Hammer, L. B. (2020). Perceived partner responsiveness, pain, and sleep: A dyadic study of military-connected couples. *Health Psychology*, *39*(12), 1089–1099. https://doi.org/10.1037/hea0001035

Pinheiro, J., Bates, D., Debroy, S., Sarkar, D., Heisterkamp, S., Van Willigen, B., & Maintainer, R. (2013). *Package 'nlme'. Linear and nonlinear mixed effects models*, *Version 3(1)*.

Reis, H. T., Clark, M. S., & Holmes, J. G. (2004). *Handbook of closeness and intimacy* (pp. 211–236). Psychology Press.

Reis, H. T., & Le, J. D. (2022). How perceived partner responsiveness contributes to well-being. In E. Rieger, R. Costanza, I. Kubiszewski, & P. Dugdale (Eds.), *Towards an integrative science of well-being*. Oxford University Press.

Reis, H. T., Lee, K. Y., O'Keefe, S. D., & Clark, M. S. (2018). Perceived partner responsiveness promotes intellectual humility. *Journal of Experimental Social Psychology*, *79*, 21–33. https://doi.org/10.1016/j.jesp.2018.05.006

Ribeiro, J. D., Franklin, J. C., Fox, K. R., Bentley, K. H., Kleiman, E. M., Chang, B. P., & Nock, M. K. (2016). Self-injurious thoughts and behaviors as risk factors for future suicide ideation, attempts, and death: A meta-analysis of longitudinal studies. *Psychological Medicine*, *46*(2), 225–236. https://doi.org/10.1017/S0033291715001804

Rintala, A., Wampers, M., Myin-Germeys, I., & Viechtbauer, W. (2020). Momentary predictors of compliance in studies using the experience sampling method. *Psychiatry Research*, *286*, 112896. https://doi.org/10.1016/j.psychres.2020.112896

Selcuk, E., & Karagobek, A. B. (2018). Responsiveness as a key predictor of happiness: Mechanisms and unanswered questions. In D. Melikşah & N. Sümer (Eds.), *Close relationships and happiness across cultures* (pp. 1–18). Springer.

Selcuk, E., Stanton, S. C., Slatcher, R. B., & Ong, A. D. (2017). Perceived partner responsiveness predicts better sleep quality through lower anxiety. *Social Psychological and Personality Science*, *8*(1), 83–92.

Sels, L., Homan, S., Ries, A., Santhanam, P., Scheerer, H., Colla, M., Vetter, S., Seifritz, E., Galatzer-Levy, I., Kowatsch, T., Scholz, U., & Kleim, B. (2021). SIMON: A digital protocol to monitor and predict suicidal ideation. *Frontiers in Psychiatry*, *12*, 554811. https://doi.org/10.3389/fpsyt.2021.554811

Slatcher, R. B., Selcuk, E., & Ong, A. D. (2015). Perceived partner responsiveness predicts diurnal cortisol profiles 10 years later. *Psychological Science*, *26*(7), 979–982. https://doi.org/10.1177/0956797615575022

Valenstein, M., Kim, H. M., Ganoczy, D., McCarthy, J. F., Zivin, K., Austin, K. L., & Olfson, M. (2009). Higher-risk periods for suicide among VA patients receiving depression treatment: Prioritizing suicide prevention efforts. *Journal of Affective Disorders*, *112*(1–3), 50–58. https://doi.org/10.1016/j.jad.2008.08.020

Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S., Selby, E. A., & Joiner, E. T., Jr. (2010). The interpersonal theory of suicide. *Psychological Review*, *117*(2), 575–600. https://doi.org/10.1037/a0018697

Wilson, S. J., Martire, L. M., & Sliwinski, M. J. (2017). Daily spousal responsiveness predicts longer-term trajectories of patients' physical function. *Psychological Science*, *28*(6), 786–797. https://doi.org/10.1177/0956797617697444

World Health Organization. (2019). *Suicide in the world: Global health estimates*. Retrieved from https://apps.who.int/iris/handle/10665/326948

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