

# *Intimate sounds of silence: its motives and consequences in romantic relationships*

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# Intimate sounds of silence: its motives and consequences in romantic relationships

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## Abstract

Silence shared between partners is a rich and understudied feature of romantic relationships. Within relationships, silence may be experienced in meaningfully different ways as a function of the motivations underlying it. These internally rich experiences may affect partners differently than silence that occurs spontaneously (i.e., without intentional initiation). In four studies, we tested the motives of silence and corresponding affect and relationship quality, operationalized through psychological need satisfactions and inclusion of other into self. Studies relied on complementary methods to explore the phenomenon of silence, namely cross-sectional, daily diary, and experimental designs. Findings across studies showed that intrinsically motivated silence was felt with more positive affect and less negative affect, and that relationships were closer and more need satisfying during intrinsically motivated moments of silence. Introjected and externally motivated silences, on the other hand, were often linked to more negative affect and lower relational outcomes. Spontaneous moments of silence were not consistently linked to affect or need satisfaction.

**Keywords** Silence · Romantic relationships · Affect · Need satisfaction · IOS · Self-determination theory

Consider two exchanges between romantic partners: They look into each other's eyes sharing intimacy and mutual understanding, or, a glance instead expresses judgment and displeasure as now they achieve a shared understanding that one partner has let down the other. In both instances, nothing is said yet much is communicated. Defined by the absence of verbal cues in an interaction (Jaworski, 1992), silence shared between individuals can mean a

multitude of things. It may be an important indicator of felt positive or negative affect, and may reflect intimacy or the lack of intimacy shared between partners. This paper was aimed at building an understanding of silence and its consequences in romantic relationships. Informed by self-determination theory (SDT; Deci & Ryan, 1985), we tested the idea that self-initiated (internal) or other-initiated (external) motives can characterize the reasons that people share silence with their partner. We also test the notion that those motives shape psychological need satisfaction when people share silence. Further informed by the self-expansion model (Aron et al., 2001), we argue that an intrinsically motivated form of silence can be a shared space where a relational identity fosters intimacy between two partners, whereas psychological distance is created under less advantageous forms of silence.

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## Silence in romantic relationships

Silence is one aspect of communication that is often overlooked and underestimated (Acheson, 2008; Berger, 2004; Bruneau, 1973; Kenny, 2018). Researchers have

failed to recognize that like speech, silence is active rather than passive (Acheson, 2008), and like speech, it is specific rather than ambiguous (Acheson, 2008; Jaworski, 1992). In those cases where the interpersonal qualities of silence have received some relatively modest consideration, it has been in evaluating political communications. In this context, theorists argue that silence is an important way of communicating meaning (Jungkunz, 2013). Theorists have also addressed silence in communication studies (Jaworski, 1992), but have not yet systematically explored the nature and function of the construct. References to silence in common speech (i.e., “silence is golden”) underscore its potential to enhance relationships. Alternatively, silence is seen to detract from relationships; “The silent treatment,” “awkward silence,” and associations with the “right to silence” all suggest that silence can be a way of self-protection for those with nefarious intentions (Cotterill, 2005). In this paper, we examined the affective and psychological need correlates of silence to describe a model of silence in relationships, and romantic relationships, in particular.

Silence is important in the context of romantic relationships for several reasons. First, silence seems to be better appreciated in romantic relationships rather than in interactions with friends and acquaintances (Damron, 2009), and so it may convey interpersonal information and thereby influence affect in these relationships. Second, in any interaction the presence of silence is a collaboration between partners: only one needs to speak for the moment of silence to end (Jaworski, 1992). In casual relationships, this might mean that moments of silence often go by fleetingly and unnoticed. However, in romantic relationships, patterns of interacting over time might mean that partners develop habits and expectations around silence and ways of interpreting its meaning (Rusbult et al., 2001). Indeed, silence in the form of passively and ambiguously remaining loyal in response to a partner’s transgression, anger, or criticism has been shown to yield mixed benefits for the relationship, but when individuals notice their partner’s acts of loyalty, and label them accordingly, it can have benefits (Drigotas et al., 1995).

In these cases, silence may play a more important role in shaping affect in romantic relationships. Furthermore, silence may offer opportunities for projecting meaning into an interpersonal space that further shapes the relational and felt experiences of interactions (Johannesen, 1974; Sperber & Wilson, 1986), and through this may create intimacy or conflict. To better understand the variety of meaningful experiences within romantic relationships, it is therefore useful to define and describe experiences within silence.

## Motives for silence

Theorists have pointed to the need to recognize and categorize the varied forms of silence (Kenny, 2018; Sim, 2007). The takeaway from these discussions is that the experience of silence is highly variable: “silence is golden” at times, but at others “[the constraint of...] silence is the most miserable of all” (Francis Bacon; Spedding et al., 2011; p. 485). The answer as to why the experience of silence varies may lie in no small part in the reasons for it. For example, silence may be self-imposed because of shyness or of a sense of personal inadequacy, used to freeze partners out (Kenny, 2018), or instead silence may be used to signal understanding (Graybar & Leonard, 2005). That is, much of the meaning of silence is derived from what it is intended to communicate. People seem to understand this intuitively. When they are asked to identify the relationship consequences of silence, positive and intimate consequences are identified as frequently as those that are negative and promote distance (Berger, 2004); thus, silence varies substantially, with both beneficial and detrimental impacts.

We explore motives for silence through the lens of self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000, 2017). SDT describes motivation as lying on a continuum of internalization, where on one end motives reflect the values and needs of the self, and on the other end motives are reactions to external demands from the environment. Motivation that is internal to the self, volitional, and driven by one’s own needs is termed intrinsic motivation. Alternatively, motivation can be characterized by external pressures (external motivation), or those that are partially internalized and self-imposed (introjected motivation; Ryan & Deci, 2000). SDT-based research has shown that as an activity is driven by intrinsic motivation, it is more likely to yield a sense of wellness (Ryan & Deci, 2000), and foster connection with others (Deci & Ryan, 2008; La Guardia & Patrick, 2008). Conversely, the more introjected and extrinsic motivations drive interpersonal behaviors outside the context of silence, the more detrimental are the outcomes for well-being (Cuevas et al., 2018; La Guardia & Patrick, 2008).<sup>1</sup> In the context of romantic relationships, more

<sup>1</sup> We did not test two other motives lying on the SDT spectrum: namely, identified motivation and integrated motivation. Identified motivation is closely concerned with action because of its felt importance; whereas romantic partners may identify that silence is important to them, it seemed unlikely they would pursue silence for its importance, and we found no evidence of this motive in writing and reviews of silence in work out of philosophy, communication, or literature, that discussed silence. In addition, integrated motivation refers to motivation that emerges from identity; this motivation, though not tested here, may be particularly important for examining dispositional relationship with silences versus examining key moments. We see these as a future direction for research, providing that researchers disagree with us on this point.

intrinsic and less introjected and external motives for relationship behaviors are linked to higher partner well-being (Knee & Petty, 2013; La Guardia & Patrick, 2008). Further, intrinsic motivation for the relationship facilitates pro-relationship responses such as forgiveness and accommodation to partner transgressions (Hadden et al., 2018), and intrinsic interdependence, more generally, yields greater relationship benefits than obligatory (i.e., introjected) interdependence (Hadden & Girme, 2020). With regard to silence in relationships, the literature has identified that *strategic* silence to facilitate self-disclosure, as one aspect of invisible support, can feel supportive to avoidant partners (Girme et al., 2019). However, more research is needed to explore silence as a standalone interpersonal behavior and, furthermore, to understand the various motives underlying shared moments of silence.

### Intrinsically motivated silence

Driven by basic needs of the self, intrinsically motivated silence reflects silence that is motivated from the self's natural desire to connect with others (Deci & Ryan, 2014). Though Western cultural biases in favor of talking foster negative perceptions of silence (Ollin, 2008), silence may have a profound ability to create positive and productive interpersonal spaces. One of the potential benefits is generating intimacy. This may be in no small part because of the capacity of silence to amplify the present and eliminate distractions. Outside of relationships, Trappist monks are known to embrace silence to eschew distractions in favor of mindful spiritual presence, in search for intimacy with the self (Merton, 1980). In the context of conversations between people, the space created by silence can be used to engage, listen, and reflect on what is said, as can be exemplified in psychotherapeutic practices (Hermans & Dimaggio, 2004). In the context of romantic relationships, intrinsically motivated silence may create a sense of intimacy and enhance mutual understanding (Jaworski, 1992) and relationship closeness (Richmond et al., 2003). Thus, intrinsically motivated silence emerges most prominently from the intrinsic desire of the self to connect with one's romantic partner, with multitude potential intrapersonal – emotional, and interpersonal – relational – benefits for the silent partner and the couple.

### Introjected silence

In contrast to intrinsic motives for silence, individuals may be silent because of self-imposed pressures and demands on themselves to say or do the right thing. Introjected silence has been observed in participants who were asked to identify reasons for silence. These participants elicited themes of anxiety and inhibition, and fear of being judged

negatively (Berger, 2004). In this research, individuals recognized a motive for silence driven by judgments and pressures imposed on the self. Such introjected silence may be experienced as unpleasant and disruptive in close social relationships, as well. Nascent evidence speaking to this identifies self-silencing behaviors in unhealthy relationships wherein partners feel unable to express their feelings. In these contexts, introjected silence may be energized from a desire to maintain harmony in the relationship or to avoid rejection from the other person (Harper & Welsh, 2007; Harper et al., 2006).

### Externally motivated silence

Though introjected motives emanate from within the self, albeit through self-imposed external pressures, a third motive for silence reflects influence directly from outside the self – in this case, as an instrumental tool in reaction to one's romantic partner. Externally motivated silence has been indirectly referred to in work that suggests silence can imply secrecy and disengagement (Ciulei, 2014), and it can be a way of imposing social control (Seljamaa & Siim, 2016). Externally motivated silence can come from a sense that one's partner is requiring or forcing silence onto the interaction, or when using silence to punish a partner; such silence can therefore be viewed as being a reactive instrument that is a reaction to a non-supportive social context.

### Amotivated silence

Finally, there may be moments where silence just *is* (Li, 2004). In these cases, silence is shared without a salient motivating reason. This amotivated silence may be felt to be spontaneous, as has been observed when participants are asked to describe silence. In this research, participants readily identify seemingly spontaneous moments absent of deep personal dynamic processes, such as being presented with unexpected information or lacking information (Berger, 2004). From a motivational perspective, by virtue of these moments of silence emerging with relatively little intentionality (either constructive or destructive), they may have less impact on relationship dynamics and on affect within the relationship.

### Outcomes of silence

Understanding the role of silence in relationships first requires that we examine the way that silence is experienced in terms of the subjective experiences that influence well-being and closeness in romantic relationships. We focus on three categories: (1) affect, (2) need satisfaction, and (3)

inclusion of partner into self, integrating the insights of self-expansion theory.

## Affect

First, key to understanding how interpersonal interactions are experienced is the positive or negative affect partners feel during those interactions, which have implications for a number of key relationship outcomes such as commitment and satisfaction (Shiota et al., 2004). To understand how silence is experienced, it is helpful to begin with an examination of the affect during silent moments in relationships. In past research, studies seeking to understand emotional consequences of relationship patterns have focused on positive and negative affect (e.g., Hicks & Diamond, 2008; Impett et al., 2010; Rafaeli et al., 2008), but more focus is being placed on the distinction between low-arousal, relaxed affect, and high-arousal, activated affect (Harmon-Jones et al., 2009; Jallais & Gilet, 2010). For example, moments characterized by low levels of stimulation, such as when individuals are in solitude or alone, tend to especially elicit low-arousal positive affect (Quietude; Nguyen et al., 2018). The valence X arousal design thus offers a highly sensitive approach to exploring the phenomenon of interpersonal silence.

## Psychological need satisfaction

Given this work is informed by the theoretical framework of self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000, 2017), we operationalize relationship quality, in part, through basic psychological need satisfaction within the relationship (Eryilmaz & Dogan, 2013; Hadden et al., 2015; Le & Agnew, 2001; Patrick et al., 2007; Uysal et al., 2010). Within SDT, relationship motivation theory (RMT; Deci & Ryan, 2014) argues that true intimacy is expressed by two psychological needs in particular: autonomy (the sense of being able to be one's self and give expression to self-processes and experiences) and relatedness (closeness and connection with others). Silence, when intrinsically motivated – may create an important relational space for such intimacy, opening a relational space for feeling closeness and connection with one's partner. Silence should also correlate with lower relatedness psychological need satisfaction when it is motivated through self-inhibition or hostility. Perhaps even more intriguing, silence may link with autonomy need satisfaction: the experience that individuals are able to be who they are, express themselves congruently, and that they are free from relational pressures. Despite silence involving no verbal self-expression, links with autonomy need satisfaction

would suggest that, counterintuitively, silence can foster the sense that one is self-congruently expressing.

To test these possibilities we explored the impact on both relatedness – the experience that one is close and connected to one's partner, and autonomy—the feeling that one can express oneself fully and behave congruently – during silence (e.g., Ryan & Deci, 2000) as two indicators of relationship quality. A third psychological need posited by SDT – competence (feeling effective in activities and able to pursue and achieve meaningful goals; Deci & Ryan, 2000) – is less relevant for understanding silence because it is typically related to external task or goal pursuit (Elliot et al., 2002); silence, in contrast, involves 'just being' with one's partner, a distinct and often not goal-directed experience (Thomas, 2023).

## Self-expansion

Positing a final indicator of relationship quality, self-expansion theory offers a different but complementing perspective of relatedness in the form of perceiving oneself as a united 'we' with one's partner (Aron & Fraley, 1999; Aron et al., 1991). Including one's partner into the self is understood to be an important indicator of intimacy (Aron & Fraley, 1999; Oriña et al., 2002), and predicts further investment in relationships (Aron et al., 1991). The relation between silence and inclusion of partner is fascinating because it suggests that partners perceive a sense of mutuality and intimacy in those moments where no (verbal) exchange is directly taking place.

## Present research

"When language ceases, silence begins. But it does not begin because language ceases. It is not merely the negative condition... rather an independent whole" (Picard, 1953; p. 17). Understanding silence as a form of communication, the current paper examines this understudied phenomenon and explores different conditions when silence occurs. We explored four general forms of silence in romantic relationships characterized by their motivation: intrinsically motivated silence, introjected silence, externally motivated silence, and spontaneous silence. Subsequently, we also looked at how different motives relate to affect in silence and how motives for silence contributed to romantic couples' need satisfaction and intimacy when sharing silence. Four studies employed cross-sectional, daily diary, and experimental methods to explore the role of silence as it is lived,



presently experienced, and recalled. Study expectations were pre-registered prior to data collection, and materials are available to download on the project page ([https://osf.io/3gtpu/?view\\_only=9d7df796015d45cfa43c22d3b83c7458](https://osf.io/3gtpu/?view_only=9d7df796015d45cfa43c22d3b83c7458)).<sup>2</sup>

We tested four hypotheses, which were based on an underlying but untested assumption: Silence could be differentiated into four forms characterized by the motives underlying them: intrinsic, introjected, external, and spontaneous.

- 1) Intrinsically motivated silence would be linked to more positive affect, and less negative affect, in solitude, and to better relationship quality (in terms of higher satisfaction of the needs for autonomy and relatedness, and more relationship closeness (IOS) during silence).
- 2) Introjected silence would be linked to less positive affect, and more negative affect, and to worse relationship quality (in terms of lower satisfaction of the needs for autonomy and relatedness, and less relationship closeness (IOS) during silence).
- 3) Externally motivated silence would be linked to less positive affect and more negative affect, and to worse relationship quality (in terms of lower satisfaction of the needs for autonomy and relatedness, and less relationship closeness (IOS) during silence).
- 4) Spontaneous (i.e., amotivated) silence would not be consistently linked to positive or negative affect, or to relationship quality (in terms of need satisfactions and IOS).

Since this work was aimed at developing a richer understanding of silence in romantic relationships, alongside pre-registered analyses we asked additional descriptive questions of the data. Specifically, we explored frequencies of the four forms of silence in romantic relationships to better understand the extent to which they are each representative of people's romantic relationship experiences. Similarly, we explored levels of affect endorsed for silence, on the whole, to describe the overall role of silence as either a positive, neutral, or negative experience within romantic relationships.

## Study 1

Study 1 was designed as a first comprehensive exploration of the forms of silence, operationalized in terms of the motives underlying them. In this first study, we examined

our assumption that four distinct forms of silence can be characterized by the following motives underlying them: Intrinsically motivated (self-initiated pursuit or expression of closeness); Introjected (felt pressure to be silent); Externally motivated (instrumental for amplifying relationship discord); Spontaneous (amotivated silence, that just *is*). More specifically, we explored the affective and relational, in terms of relationship quality, correlates of each form of silence to test directional Hypotheses 1–4. To this end, we asked participants to reflect on their general event recollections of silence (Conway & Pleydell-Pearce, 2000); these summarized events are the most salient forms of recollections and efficiently communicate to both oneself and to others the specifics of one's past (Conway, 1992, 1996).

## Method

### Participants and procedure

A-priori power analysis using Gpower (Faul et al., 2007) indicated that a sample size of  $N=110$  was needed to achieve a power of above 0.90 to detect a small to medium effect size, namely,  $r=0.30$ . In case of missing data, we posted 120 slots on Prolific Academic with an inclusion criterion that participants must be in a romantic relationship and received 121 responses (74 females, 44 males, 3 missing) between the age of 19 and 63 years ( $M_{\text{age}}=32.69$  years,  $SD=9.37$ ). The majority of participants reported either being in a steady relationship ( $n=58$ ) or being married ( $n=46$ ), with only a few people who were engaged ( $n=8$ ) or dating ( $n=9$ ).

Participants were asked to reflect on silence with partner relationships using the following text: "*There are moments when partners in a relationship stay silent together for whatever reasons, except for times when you two are in the middle of an activity that is difficult for talking like exercising, or in a situation where silence is expected, such as listening to someone talk, being at a noisy place, sitting in class, in the library, at church, or at the movie theater. Those moments might be rare or might happen quite often in different relationships.*" Participants were asked to reflect on these moments, and then responded to a number of measures asking about their experiences in silence, which are described below. Approval for this, and Studies 3 and 4, was given by [blinded for peer review] Ethics Committee (EC.19.09.10.5686). The full set of materials, data and code used for this and future studies is available for researcher use by request.

### Materials

Measures were focused on experiences within silence in one's romantic relationship. This included a measure we developed to assess the motives of silence to differentiate

<sup>2</sup> We pre-registered hypotheses and analytic plans for three additional studies not reported below. Findings from these additional studies are largely consistent with the four studies reported in this paper but were cut due to paper length.

**Table 1** Study 1 exploratory factor analyses with an Oblimin rotation for silence motives

	1 Introjected	2 Intrinsic	3 Spontaneous	4 External
Because I felt inhibited	<b>.81</b>	-.04	-.05	.09
Because I feared he/she would be mad at me if I said something	<b>.76</b>	-.13	-.06	-.07
Because I felt afraid to express myself	<b>.89</b>	.04	-.11	-.02
Because I wasn't sure what would be a correct thing to say	<b>.79</b>	.06	-.17	.05
Because I felt he/she would not understand me	<b>.62</b>	-.33	.15	.13
<i>Because negative feelings were getting in the way of me speaking</i>	<b>.81</b>	.14	.12	.10
<i>Because I felt disengaged and distant</i>	<b>.76</b>	.02	.11	.11
Because those silent moments are usually fun	.06	<b>.86</b>	-.10	.07
Because I often find those silent moments enjoyable and pleasant	.02	<b>.81</b>	.15	-.09
Because I value silent moments in our relationship	-.05	<b>.79</b>	.10	-.03
Because I cherish moments when I am able to be next to him/her even if we aren't speaking	-.14	<b>.64</b>	.23	-.17
Because the silence added to our feelings of intimacy	-.13	<b>.82</b>	-.20	.12
Because I didn't need to speak for my partner to get me	.21	<b>.59</b>	.22	-.27
No specific reason; I didn't pay attention to why it happened	-.08	.15	<b>.79</b>	.26
No specific reason; it just happened to be that way	-.03	-.09	<b>.85</b>	-.17
Because I wanted him/her to feel bad	.08	.01	.18	<b>.87</b>
Because I wanted to punish him/her	.26	.06	-.03	<b>.71</b>
Because he/she wanted me to be silent	.05	-.12	-.08	<b>.55</b>

Components emerging from exploratory factor analysis using Oblimin rotation. Italicized items were initially intended for the 'external' silence subscale, but loaded onto 'introjected' silence instead

the four forms of silence under study. We further evaluated affective and relationship quality correlates within silence. To control for overall relationship positivity driving any effects identified, we tested and controlled for psychological need satisfactions and IOS at the relationship level when predicting those outcomes for silence, specifically. Because we did not measure relationship-level affect, we instead controlled for relationship satisfaction – a measure broadly reflecting contentment with one's partner (Hendrick et al., 1988) – when predicting affect during silence.

**Frequency of silence** Participants responded to the item "How often can you recall these instances in your relationship with your partner?" using a 6-point scale ranging from 1 (*almost never / very infrequently*) to 6 (*every time we are together*). The average response on this scale was,  $M = 3.41$  ( $SD = 1.42$ ).

**Motives for silence** Participants were given the instructions: "There are many reasons why moments of silence occur in a relationship; at times they are pretty neutral, and other times they can be unpleasant or pleasant. Please indicate, in general, to what extent each of the following reasons is characteristic of those moments that occur in your relationship," with response options ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Eighteen items were designed to try

to measure each of the four motives for silence: intrinsic (6 items); introjected (5 items); external (5 items); and spontaneous (2 items). These were subjected to an exploratory factor analysis (EFA).

The EFA, using an Oblimin rotation, revealed four factors with eigenvalues  $> 1.0$ , which are presented in Table 1. A first factor that emerged explained 35.33% of the variance in the full set of items and consisted of seven items representing silence motivated by *introjection* ( $\alpha = 0.91$ ). The second factor explained 18.86% additional variance and reflected through six items silence motivated *intrinsically* with one's partner ( $\alpha = 0.87$ ). A third factor comprising of two items explained an additional 7.92% of variance in the full scale, and those items represented silence that occurs *spontaneously*, without any specific reasons ( $r = 0.47$  between the two items measuring spontaneous (i.e., amotivated) silence,  $p < 0.01$ ). Finally, a last factor of three items explained 6.04% additional, and represented *external* silence ( $\alpha = 0.68$ ). Although, against expectations, two items loaded onto the *introjected* dimension rather than the *externally motivated silence* factor, we retained those items on their new factor since there was no evidence of cross-loadings onto the anticipated factor (see Table 1; items italicized). Silence motives variables were normally distributed (intrinsically motivated silence (skew = -0.54; kurtosis = 0.01); introjected silence



(skew = 0.42; kurtosis = -0.87); externally motivated silence (skew = 0.87; kurtosis = -0.34); spontaneous silence (skew = -0.42; kurtosis = 0.02)). In sum, we observed four types of silence motivated by different reasons: introjected silence, intrinsically motivated silence, spontaneous silence, and externally motivated silence.

**Affect (context: within silence)** State-level affect during silence was measured with a 12-item scale from De Dreu et al. (2008), which differentiated high-arousal positive affect (i.e., happy, elated, excited;  $\alpha = 0.76$ ), high-arousal negative affect (i.e., afraid, worried, angry;  $\alpha = 0.86$ ), low-arousal positive affect (i.e., calm, relaxed, at ease;  $\alpha = 0.87$ ), and low-arousal negative affect (i.e., bored, depressed, lonely, sad, drained;  $\alpha = 0.73$ ). Participants reported how much each affect reflected their experiences in silence with a scale ranging from 1 (*not at all*) to 5 (*very much*).

**Psychological need satisfaction (context: within silence & in relationship)** Autonomy and relatedness need satisfactions were measured with the six items of the Basic Psychological Needs scale (BPNS; La Guardia et al., 2000). For example, participants were prompted to reflect how much, during moments of silence shared with their partner, they “felt free to be who I am” (autonomy need satisfaction;  $\alpha = 0.84$ ), and “felt loved and cared about” (relatedness need satisfaction;  $\alpha = 0.89$ ). Items were paired with a seven-item scale ranging from (1) *not at all* to (7) *very much*. The same items were used to measure relationship-level psychological autonomy and relatedness need satisfaction, this time referring to experiences with one’s partner, in general (autonomy need satisfaction;  $\alpha = 0.70$ ; relatedness need satisfaction;  $\alpha = 0.78$ ).

**Inclusion of other into self (IOS; context: within silence & in relationship)** Participants selected one of seven increasingly overlapping circles, labelled “me” and “partner,” adapted from the Inclusion of Other into Self (IOS) scale (Aron et al., 1992), which has been previously used to assess interpersonal closeness (Agnew et al., 2004). Participants responded to the stem, “Please choose the picture that best describes how you felt about your relationship with your romantic partner during that instance [of silence].” The average response on the 1–7 scale was somewhat high, at  $M = 5.03$ ,  $SD = 1.71$ . Participants also reported on their relationship-level IOS, referring to experiences with one’s partner, in general ( $M = 5.41$ ,  $SD = 1.11$ ).

**Relationship satisfaction (context: in relationship)** Relationship satisfaction was measured with four items of the Relationship Satisfaction Scale (RSS; Levesque, 1993) which are “In general, I am satisfied with our relationship,” “Compared to other people’s relationships ours is pretty good,” “Our relationship has met my best expectations,” and “Our relationship

is just about the best relationship I could have hoped to have with anybody,” paired with a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Overall internal reliability was high,  $\alpha = 0.91$ .

## Results

### Portrayal of silence and its motives

**Correlates of the motives for silence** Table 2 presents zero-order correlations. Low correlations were observed between all four forms of silence. Notably, spontaneous silence correlated weakly to moderately with the three forms of motivated silence ( $r = -0.07$  to  $0.33$ ). The single highest correlation observed was between introjected and externally motivated silence ( $r = 0.57$ ). These patterns suggest distinctiveness between the four types of silence under study.

Further, all four forms of silence meaningfully correlated with affect and relational outcomes when tested separately. Specifically, intrinsically motivated silence was linked to more positive, and less negative affect, and more positive relational experiences on all indicators. Both introjected and externally motivated silence showed links with less positive experiences both in terms of affect and relationships. Finally, an examination of Table 5 shows that spontaneous silence, which was not characterized by any particular motive, showed weaker relations with study outcomes. This was supported from findings applying the “Paired.R” function of the “Psych” package in R, comparing spontaneous silence coefficients with those for intrinsic, introjected, and external silence across each study outcome (Table 3). However, even spontaneous silence was linked to more low-arousal positive affect, and more autonomy and relatedness need satisfaction.

**How frequent is silence and its motives?** On average, participants reported experiencing meaningful silence with their partners approximately once a week ( $M = 3.41$ ,  $SD = 1.42$ ); they were generally able to reflect back to previous and somewhat recent experiences of silence. A repeated measures analysis of variance (ANOVA) indicated that motives were experienced at different frequencies;  $F(3, 357) = 115.67$ ,  $p < 0.001$ ,  $\eta^2 = 0.49$ . Moments of silence were intrinsically motivated ( $M = 4.68$ ,  $SD = 1.30$ , 95% CI [4.45, 4.92]), and they occurred spontaneously ( $M = 4.87$ ,  $SD = 1.38$ ; 95% CI [4.62, 5.12]). As compared to intrinsically motivated silence, lower frequencies were reported for introjected ( $M = 2.80$ ,  $SD = 1.41$ ; 95% CI [2.55, 3.06],  $t(118) = 9.61$ ,  $p < 0.001$ ), and externally motivated ( $M = 2.29$ ,  $SD = 1.37$ ; 95% CI [2.05, 2.54],  $t(118) = 12.51$ ,  $p < 0.001$ ) silence. In sum, both intrinsic and spontaneous forms of silence were reported at higher rates than introjected and

**Table 2** Study 1 descriptives and zero-order correlations between self-reported variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Intrinsic	4.68	1.30												
2. Introjected	2.80	1.41	-.25**											
3. External	2.29	1.37	-.23*	.57***										
4. Spontaneous	7.98	6.33	.33**	-.07	-.07									
5. Rel. length	4.87	1.38	-.14	.10	.11	.17								
6. Rel. Sat	5.54	1.29	.42***	-.50***	-.37***	.16	-.16	—						
7. Low positive	3.50	1.26	.54***	-.43***	-.46***	.30***	-.13	.49***	—					
8. Low negative	1.69	0.94	-.42***	.59***	.45***	-.15	.12	-.45***	-.65***	—				
9. High positive	2.65	1.06	.41***	-.31***	-.29**	.03	-.10	.39***	.67***	-.46***	—			
10. High negative	1.62	0.95	-.31***	.53***	.40***	-.13	.01	-.25**	-.59***	.84***	-.36***	—		
11. Aut. NS	5.49	1.46	.56***	-.50***	-.47***	.33***	-.10	.52***	.81***	-.74***	.56***	-.65***	—	
12. Related. NS	5.11	1.73	.63***	-.52***	-.42***	.31***	-.17	.62***	.81***	-.79***	.60***	-.65***	.87***	—
13. IOS	4.40	2.06	.39***	-.37***	-.30***	.12	-.09	.52***	.60***	-.48***	.40***	-.38***	.64***	.67***

Var. 1–4=types of silence. Var. 5=relationship length. Var. 6=relationship satisfaction. Var. 7–10=four types of affect. Var 11: Aut. NS=autonomy need satisfaction; Var 12: Related. NS=relatedness need satisfaction; Var 13: IOS=inclusion of other into self. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

**Table 3** Study 1 effect size comparisons between spontaneous silence and introjected and external silence for study outcomes

	<i>Spontaneous vs. Intrinsic</i>		<i>Spontaneous vs. Introjected</i>		<i>Spontaneous vs. External</i>	
	<i>t-value</i>	<i>p-value</i>	<i>t-value</i>	<i>p-value</i>	<i>t-value</i>	<i>p-value</i>
Low positive	-2.64	.009	6.14	< .001	6.66	< .001
Low negative	2.76	.007	-6.55	< .001	-5.00	< .001
High positive	-3.78	< .001	2.63	.001	2.47	.015
High negative	1.76	.081	-5.69	< .001	-4.30	< .001
Aut. NS	-2.58	.011	7.51	< .001	7.15	< .001
Related. NS	-3.77	.000	7.55	< .001	6.29	< .001
IOS	-2.72	.007	3.90	< .001	3.28	.001

externally motivated silence, the two more destructive forms of silence.

**Which affect are most likely experienced in silence?** A second repeated-measures ANOVA predicting all four affect indicators simultaneously suggested that silence also differentially linked to affect,  $F(3, 351) = 75.84$ ,  $p < 0.001$ ,  $\eta^2 = 0.39$ . Setting aside their motives, moments of silence were characterized by low-arousal positive affect ( $M = 3.50$ ,  $SD = 1.26$ , 95% CI [3.27, 3.73]), and to a lesser degree by high-arousal positive affect ( $M = 2.65$ ,  $SD = 0.94$ ; 95% CI [2.46, 2.85],  $t(118) = 9.53$ ,  $p < 0.001$ ). Silence was also less likely characterized by low-arousal negative ( $M = 1.69$ ,  $SD = 1.06$ ; 95% CI [1.52, 1.86], as compared to high-arousal positive,  $t(118) = 6.16$ ,  $p < 0.001$ ), or high-arousal negative ( $M = 1.62$ ,  $SD = 0.95$ ; 95% CI [1.45, 1.80], as compared to high-arousal positive,  $t(118) = 6.75$ ,  $p < 0.001$ ) affect. High- and low-arousal negative affect were experienced in similar rates,

$t(118) = 1.27$ ,  $p = 0.21$ . In sum, silence was experienced with positive, more than negative affect, and particularly with *low-arousal* positive affect.

### Motives for silence and its correlates (experience of silence)

**Affect (intrapersonal) correlates** Multiple linear regression models regressed affect within silence onto the four motives for silence and the two control variables: relationship satisfaction and length of relationship. These six predictors accounted for 34% to 46% of variance in affect in silence. Table 4 presents findings. Neither relationship satisfaction nor relationship length related to affect in these models accounting for silence motives. Intrinsically motivated silence predicted more positive, and less negative, affect in silence. Introjected silence related to less low-arousal *positive* affect, while spontaneous silence linked to higher reports of these affect. On the other hand,

**Table 4** Study 1 regression analyses predicting affect from silence motives and control variables

		95% CI						95% CI							
		$\beta$	lower	upper	$pr$	$t$	$p$			lower	upper	$pr$	$t$	$p$	
		Low Arousal PA								Low Arousal NA					
		$\Delta R^2 = .46$								$\Delta R^2 = .40$					
1	Relationship sat	.14	-.04	.32	.11	1.58	.117	1	-.07	-.26	.12	-.05	-0.74	.459	
2	Relationship length	-.04	-.19	.10	-.04	-0.60	.549	2	.02	-.13	.17	.02	0.28	.779	
3	Intrinsic	<b>.33</b>	<b>.17</b>	<b>.49</b>	<b>.29</b>	<b>4.06</b>	<b>&lt;.001</b>	3	<b>-.25</b>	<b>-.41</b>	<b>-.08</b>	<b>-.21</b>	<b>-2.90</b>	<b>.005</b>	
4	Introjected	-.10	-.28	.09	-.08	-1.06	.290	4	<b>.41</b>	<b>.23</b>	<b>.60</b>	<b>.31</b>	<b>4.34</b>	<b>&lt;.001</b>	
5	External	<b>-.25</b>	<b>-.42</b>	<b>-.08</b>	<b>-.20</b>	<b>-2.87</b>	<b>.005</b>	5	.12	-.05	.30	.10	1.40	.164	
6	Spontaneous	<b>.16</b>	<b>.01</b>	<b>.32</b>	<b>.15</b>	<b>2.12</b>	<b>.037</b>	6	-.02	-.18	.13	-.02	-0.31	.755	
		High Arousal PA								High Arousal NA					
		$\Delta R^2 = .24$								$\Delta R^2 = .34$					
1	Relationship sat	.19	-.02	.43	.15	1.79	.077	1	.15	-.05	.34	.12	1.51	.133	
2	Relationship length	.02	-.16	.43	.02	0.23	.819	2	-.05	-.21	.10	-.05	-0.66	.513	
3	Intrinsic	<b>.32</b>	<b>.13</b>	<b>.54</b>	<b>.27</b>	<b>3.29</b>	<b>.001</b>	3	<b>-.23</b>	<b>-.39</b>	<b>-.04</b>	<b>-.19</b>	<b>-2.48</b>	<b>.015</b>	
4	Introjected	-.09	-.32	.14	-.07	-0.80	.426	4	<b>.47</b>	<b>.26</b>	<b>.65</b>	<b>.36</b>	<b>4.60</b>	<b>&lt;.001</b>	
5	External	-.08	-.30	.13	-.07	-0.80	.427	5	.14	-.05	.32	.11	1.43	.155	
6	Spontaneous	-.12	-.32	.07	-.11	-1.31	.194	6	-.03	-.20	.13	-.03	-0.40	.689	

Results are bolded where type of silence has a statistically significant relation with affective correlates

“Relationship-level” refers to the relationship level variable corresponding to the outcome being tested in the particular model. For example, for IOS, it refers to the degree of IOS with one's partner in general when predicting IOS within silence. \*\*When controlling for relationship satisfaction, the models predicted 56%, 61%, and 41% of the variance in the three outcomes, effectively 0, 1, and 0% more than predicted by the original variables

externally motivated silence related to both higher *negative* affect (both low- and high-arousal).

**Relationship quality** We regressed each of the relational quality indicators (autonomy need satisfaction, relatedness need satisfaction, and self-partner inclusion) onto the four motives for silence. Table 5 presents findings. Relationship-level standing linked robustly to corresponding silence-specific outcomes. Intrinsically motivated silence strongly and positively correlated with autonomy need satisfaction, relatedness need satisfaction, and self-partner inclusion, even after equivalent relationship-level variables were controlled for. Introjected silence negatively correlated with relatedness need satisfaction and self-partner inclusion during silence, while externally motivated silence was linked to lower autonomy need satisfaction during silence.

## Conclusions

In Study 1, we explored three motives for silence: intrinsically motivated, introjected, and externally motivated, and differentiated them from silence that occurs spontaneously. Analyses showed that silence in current romantic relationships was most likely intrinsically motivated and that it often occurred spontaneously. Furthermore, silence was most likely characterized by positive, and especially low-arousal,

positive affect, in line with findings from previous research studying *solitude* that benefits attained when not actively interacting with others lie in lower arousal affect (Nguyen et al., 2018). Interestingly, when comparing relational experiences within silence to those same relational experiences across the relationship (outside the context of silence), we found higher reporting of both autonomy and relatedness need satisfactions in silence than those same need satisfactions across the relationship. This suggested that silence can serve as a positive opportunity for relational connection and self-expression, despite the lack of vocalized content.

Testing our hypotheses, we found strong support for our Hypothesis 1 regarding the correlates of intrinsically motivated silence. In both correlational analyses and in more conservative simultaneous regression analyses, intrinsically motivated silence related to more positive and less negative affect in silence. Examining relationship quality, intrinsically motivated silence related to both need satisfactions and IOS, even when controlling for relationship-level standing on these variables.

A different set of patterns emerged for introjected and externally motivated silence in conservative simultaneous models as compared to correlational analyses. In correlational analyses, both detrimental forms of silence linked consistently and in expected directions to unfavorable affect and relationship quality experiences. In more conservative analyses, only introjected silence related to a

**Table 5** Study 1 regression analyses predicting relationship quality from silence motives and control variables

		$\beta$	95% CI		<i>pr</i>	<i>t</i>	<i>p</i>
			lower	upper			
Autonomy NS $\Delta R^2 = .56$							
1	Relationship length	-.03	-.16	.10	-.03	-0.37	.661
2	Relationship-level	.27	.11	.43	.21	2.94	.001
3	Intrinsic	<b>.34</b>	<b>.20</b>	<b>.48</b>	<b>.30</b>	<b>4.44</b>	<b>&lt;.001</b>
4	Introjected	-.13	-.31	.04	-.10	-0.14	.135
5	External	<b>-.20</b>	<b>-.36</b>	<b>-.05</b>	<b>-.17</b>	<b>-2.54</b>	<b>.011</b>
6	Spontaneous	<b>.14</b>	<b>.01</b>	<b>.29</b>	<b>.13</b>	<b>2.00</b>	<b>.046</b>
Relatedness NS $\Delta R^2 = .60$							
1	Relationship length	-.04	-.17	.10	-.03	-0.53	.600
2	Relationship-level	.24	.07	.41	.17	2.84	.005
3	Intrinsic	<b>.39</b>	<b>.24</b>	<b>.52</b>	<b>.32</b>	<b>5.31</b>	<b>&lt;.001</b>
4	Introjected	<b>-.24</b>	<b>-.24</b>	<b>-.08</b>	<b>-.18</b>	<b>-2.95</b>	<b>.004</b>
5	External	-.08	-.23	.07	-.06	-1.06	.292
6	Spontaneous	<b>.13</b>	<b>-.00</b>	<b>.27</b>	<b>.12</b>	<b>1.94</b>	<b>.056</b>
IOS $\Delta R^2 = .41$							
1	Relationship length	-.01	-.17	.14	-.01	-0.15	.881
2	Relationship-level	.41	.27	.59	.40	5.37	<.001
3	Intrinsic	<b>.21</b>	<b>.05</b>	<b>.38</b>	<b>.19</b>	<b>2.55</b>	<b>.012</b>
4	Introjected	<b>-.21</b>	<b>-.39</b>	<b>-.03</b>	<b>-.17</b>	<b>-2.28</b>	<b>.025</b>
5	External	-.09	-.28	.09	-.07	-1.00	.317
6	Spontaneous	.06	-.10	.23	.06	0.75	.455

Results are bolded where type of silence has a statistically significant relation with affective correlates

“Relationship-level” refers to the relationship level variable corresponding to the outcome being tested in the particular model. For example, for IOS, it refers to the degree of IOS with one's partner in general when predicting IOS within silence. \*\*When controlling for relationship satisfaction, the models predicted 56%, 61%, and 41% of the variance in the three outcomes, effectively 0, 1, and 0% more than predicted by the original variables

majority of the outcomes tested: namely, to negative, but not positive, affect, and to lower relatedness need satisfaction and IOS. However, introjected silence did not relate to autonomy need satisfaction, an unexpected finding since inhibition should undermine felt self-expression aspects of autonomy need satisfaction (e.g., Ryan et al., 2016).

Further, externally motivated silence related to very few of the affective and relational correlates tested, and specifically to higher negative affect and lower autonomy. In sum, we found substantial, but not full, support for our Hypothesis 2 regarding the detrimental affective and relational quality correlates of introjected silence, and partial support for our third hypothesis linking externally motivated silence to affect and relationship quality in silence. Finally, we did not have strong expectations regarding spontaneous motives, but found that in simultaneous models, spontaneous motives for silence related weakly ( $pr = 0.13$ – $0.15$ ) to more low-arousal positive affect, suggesting that silence offers an opportunity for relaxation and self-congruency and self-expression.

## Study 2

Following our initial investigation of silence and its correlates at the individual level, in a second study we examined the motives behind silence, and their affective and relationship quality correlates, at the daily level. Experiences of silence within romantic relationships likely vary from day to day. Measuring moments of silence more closely in time to when they occur could provide additional evidence of the robustness of the phenomenon on a daily basis. Assessing moments of silence at the within-person level allows us to examine whether daily experiences of silence are accompanied by similar affective and relationship quality correlates as we found in Study 1. To this end, this study used an ecological momentary assessment methodology with individuals in a romantic relationship, assessing silence in their daily interactions with partners across fourteen days. We once again tested our hypotheses 1–4 regarding the beneficial role of intrinsically motivated silence (Hypothesis 1), detrimental roles of introjected silence (Hypothesis 2) and externally motivated silence (Hypothesis 3), and the

role of spontaneous silence, for which we did not have a directional hypothesis.

In Study 2, we took a confirmatory theory-testing approach to conceptually replicate the core findings from Study 1 (Munafò et al., 2017). However, it is worth noting a deviation from the registered analysis plan: ([https://osf.io/3gtpu/?view\\_only=9d7df796015d45cfa43c22d3b83c7458](https://osf.io/3gtpu/?view_only=9d7df796015d45cfa43c22d3b83c7458)). Specifically, although we planned to control for relationship satisfaction alongside relationship-level versions of the outcomes (e.g., relationship-level need satisfactions), we found across studies that the two types of measures (relationship satisfaction and relationship-level quality measures, for example) were highly correlated; we selected to stay consistent with the Study 1 strategy of controlling for relationship satisfaction only when a relationship-level version of the silence-specific outcome had not been measured.

## Participants

We attempted to recruit the maximum number of individuals during the last month of an academic semester and recruited 107 participants currently in a romantic relationship. Post-hoc sensitivity analyses using G\*Power (Faul et al., 2007) indicated our sample achieved a power of above 0.80 to detect a small to medium effect size, namely,  $r = 0.30$ . Participants were between the age of 18 and 24 years ( $M_{\text{age}} = 20.36$  years,  $SD = 1.36$ ). The sample consisted of 50 (46.7%) Caucasians, 36 (33.6%) Asians or Asian Americans, 7 (6.5%) Blacks or African Americans, 3 (2.8%) who are American Indian/Alaska Native or multiracial. Twenty (18.7%) participants identified as Hispanic or Latino. Fourteen (13.1%) participants reported they were dating casually, 92 (86%) reported they were dating exclusively, and 1 participant was engaged at the time of the study. The average length of relationships was low at  $M = 2.0$  months, but with  $SD = 1.0$  year.

## Procedure and materials

Participants were recruited who were students in a mid-sized North American university. This study received ethical approval ([masked] University Ethics Approval: IRB# 3620). To sign up for the study, participants first completed an initial survey assessing their general experiences over the past two weeks and general experiences within their romantic relationships. These comprised relationship-level controls: autonomy need satisfaction ( $\alpha = 0.79$ ), relatedness need satisfaction ( $\alpha = 0.75$ ), relationship-level IOS ( $M = 5.24$ ,  $SD = 1.42$ ), and relationship satisfaction ( $\alpha = 0.86$ ) with the measures used in Study 1. Participants

were also asked questions about their social media activities, included for a different study and not discussed in this paper.

Participants were contacted starting the Monday following the baseline survey to complete surveys daily for 14 days. In each daily survey, participants responded to questions about their experiences of silence when spending time with their partners. If participants indicated that they had not physically been around their partner that day, they were instead asked questions focused on envisioning an absent partner. These questions were used to mask the purpose of the study and so that participants would not be tempted to reduce the participation time with false reports that they had not seen their partners; these will not be analyzed here. Out of 107 participants that completed the initial survey, 87 (81%) provided diary data. *T*-test comparisons of those who did and did not complete the diary portion of the study showed only one significant difference between the two groups – predicting IOS – out of four tests conducted: those higher in IOS ( $M = 5.80$ ,  $SD = 0.75$  vs.  $M = 5.64$ ,  $SD = 0.82$ ) were more likely to complete the diary portion of the study,  $t(105) = 2.54$ ,  $p = 0.01$ ,  $d = 0.20$ . There was no significant difference between these two groups in relationship length, psychological need satisfactions, or relationship satisfaction,  $t_s(105) < 1.40$ ,  $p_s > 0.16$ . Three out of 87 participants did not report seeing their partners on any day of the 14 days, so they did not provide any silence-related data and were excluded from the present study. Therefore, we only reported the results on those 84 participants that remained in the study. Overall, the average completion rate was 61.4%, with 58 out of 84 participants (69%) completing at least 7 out of the 14 days, and 75 out of 84 participants (89%) completing at least 3 days.

Participants completed a shortened version of the motives for silence scale to reduce participant burden inherent to a diary methodology (Fisher & To, 2012). This time, four items – the highest loading from Study 1 – reflected intrinsically motivated silence since this was a robust predictor in the previous study ( $\alpha = 0.89$ ), two items measured introjected silence ( $\alpha = 0.85$ ), two externally motivated silence ( $\alpha = 0.86$ ), and one represented spontaneous ( $M = 3.92$ ,  $SD = 1.93$ ) silence.

Affects in silence were tested using one item for each, from the same scales as Study 1: low-arousal positive (calm:  $M = 3.60$ ,  $SD = 1.17$ ), low-arousal negative (sad:  $M = 1.72$ ,  $SD = 1.06$ ), high-arousal positive (happy:  $M = 3.35$ ,  $SD = 1.17$ ), and high-arousal negative (anxious:  $M = 1.90$ ,  $SD = 1.10$ ). We measured relationship quality outcomes: autonomy psychological need satisfactions ( $\alpha = 0.80$ ), relatedness need satisfaction ( $\alpha = 0.73$ ), and daily IOS ( $M = 4.27$ ,  $SD = 1.50$ ), using the same scales as in the previous study.



**Table 6** Study 2 descriptives, ICCs, and zero-order correlations between self-reported variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. Intrinsic	3.73	1.52	(.60)										
2. Introjected	1.76	1.21	-.16**	(.48)									
3. External	1.49	1.00	-.19**	.60**	(.50)								
4. Spontaneous	3.92	1.93	.10*	-.15**	-.21**	(.43)							
5. Low positive	3.60	1.17	.38**	-.35**	-.33**	.19**	(.35)						
6. Low negative	1.72	1.06	-.24**	.59**	.46**	-.21**	-.47**	(.36)					
7. High positive	3.35	1.17	.55**	-.33**	-.28**	.12**	.58**	-.50**	(.43)				
8. High negative	1.90	1.10	-.17**	.45**	.31**	-.08	-.49**	.59**	-.36**	(.39)			
9. Aut. NS	5.53	1.26	.40**	-.65**	-.55**	.23**	.48**	-.56**	.54**	-.42**	(.55)		
10. Related. NS	5.43	1.25	.56**	-.51**	-.52**	.19**	.50**	-.56**	.63**	-.34**	.73**	(.49)	
11. IOS	4.17	1.46	.19**	-.26**	-.19**	.06	.24**	-.23**	.33**	-.09*	.30**	.43**	(.63)

Var 1–4=daily motives for silence compiled across days. Var 5–8=daily affect within silence compiled across days. Var 9–11=daily relational experiences within silence compiled across days (Aut. NS=autonomous need satisfaction; Related. NS=relatedness need satisfaction; IOS=inclusion of other within silence). Italicized values along the diagonal show Intraclass Correlation Coefficients (ICCs) for each variable.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

## Results

### Preliminary analyses

**Correlates of motives for silence** Variables were compiled across days to explore their individual-difference level relations (Table 6). This preliminary analysis indicated significant but moderate individual-level relations between the forms of silence, with the strongest correlation being, as may be expected, between external and introjected silence ( $r = 0.60$ ). At the individual level, higher standing on each of the three silence motives was significantly related to more affective and relational correlates in the anticipated directions ( $r_s = \pm 0.17$ – $0.65$ ), whereas effect sizes were weaker and mixed for spontaneous silence and affective and relational correlates ( $r_s = \pm 0.02$ – $0.23$ ). Where spontaneous silence did relate significantly to affect and relational correlates, it was in the direction of spontaneous silence as a positive experience, with more positive and less negative low-arousal affect, in particular ( $r_s = 0.19$  &  $-0.21$ ), and higher autonomy need satisfaction ( $r = 0.23$ ).

**How likely are the daily motives of silence?** A repeated measures ANOVA indicated, as before, that different motives were endorsed, this time on a day level,  $F(3, 2170) = 418.19$ ,  $p < 0.001$ ,  $\eta^2 = 0.37$ . When reflecting back to experiences within the day, participants reported experiencing more intrinsically motivated ( $M = 3.73$ ,  $SD = 1.52$ , 95% CI [3.60, 3.85]) and spontaneous ( $M = 3.92$ ,  $SD = 1.93$ , 95% CI [3.80, 4.05]) silence as compared to introjected ( $M = 1.76$ ,  $SD = 1.21$ , 95% CI [1.64, 1.88],  $t_s = 22.26$  and  $24.49$ ,  $p_s < 0.001$ ) and externally motivated ( $M = 1.49$ ,  $SD = 1.00$ , 95% CI [1.37, 1.61],  $t_s = 25.31$  and  $27.55$ ,  $p_s < 0.001$ ) silence

on a daily basis. These findings echoed those of Study 1, highlighting that both intrinsically motivated and spontaneous silence were experienced more frequently than more detrimental forms.

**Which affect are most likely experienced in daily silence?** A repeated measures ANOVA predicted differences between the four types of affect across all participants and days,  $F(3, 2158) = 339.16$ ,  $p < 0.001$ ,  $\eta^2 = 0.36$ . Across days and participants, daily silence was characterized by low-arousal positive affect (calm;  $M = 3.60$ ,  $SD = 1.17$ , 95% CI [3.51, 3.70]), and to a lesser degree by high-arousal positive affect (happy;  $M = 3.35$ ,  $SD = 1.17$ , 95% CI [3.25, 3.44],  $t = -3.76$ ,  $p = 0.001$ ). Silence was also less likely characterized by low-arousal negative (sad;  $M = 1.72$ ,  $SD = 1.06$ , 95% CI [1.63, 1.82]), as compared to high-arousal positive,  $t = -23.70$ ,  $p < 0.001$ , or less likely characterized by high-arousal negative (anxious;  $M = 1.90$ ,  $SD = 1.10$ , 95% CI [1.81, 2.00]), as compared to high-arousal positive,  $t = -21.02$ ,  $p < 0.001$ ) affect. There was a smaller difference between high- and low-arousal negative affect,  $t = 2.67$ ,  $p = 0.039$ . In sum, silence was experienced with positive, more than negative affect, and particularly with low-arousal positive affect.

### Motives for silence and its correlates (experience of silence)

**Analytic approach** We conducted a multilevel regression model with estimation of both fixed and random effects using the ‘lmer’ function in R. We entered all four forms of motivation for silence simultaneously into the models that predict four types of affect experienced in silence, satisfaction of relatedness and autonomy needs in silence, and inclusion of others in self in silence. We included random intercepts for participants. We furthermore included



**Table 7** Study 2 multilevel analyses predicting affect from silence motives and control variables

		$\beta$	95% CI		$t$	$p$			$\beta$	95% CI		$t$	$p$
			lower	upper						lower	upper		
		Calm					Sad						
		$\Delta R^2 = .26$					$\Delta R^2 = .39$						
1	Relationship length	.02	-.09	.14	0.39	.699	1	.06	-.05	.17	1.10	.273	
2	Relationship satisfaction	.15	.02	.28	2.19	.031	2	-.03	-.15	.09	-0.44	.662	
3	Intrinsic	<b>.29</b>	<b>.20</b>	<b>.38</b>	<b>6.33</b>	<b>&lt; .001</b>	3	<b>-.17</b>	<b>-.25</b>	<b>-.09</b>	<b>-4.01</b>	<b>&lt; .001</b>	
4	Introjected	<b>-.18</b>	<b>-.28</b>	<b>-.08</b>	<b>-3.54</b>	<b>&lt; .001</b>	4	<b>.42</b>	<b>.33</b>	<b>.51</b>	<b>9.26</b>	<b>&lt; .001</b>	
5	External	<b>-.12</b>	<b>-.22</b>	<b>-.02</b>	<b>-2.42</b>	<b>.016</b>	5	<b>.20</b>	<b>.11</b>	<b>.28</b>	<b>4.30</b>	<b>&lt; .001</b>	
6	Spontaneous	<b>.08</b>	<b>.00</b>	<b>.16</b>	<b>1.95</b>	<b>.052</b>	6	-.07	-.15	.00	-1.94	.053	
		Happy					Anxious						
		$\Delta R^2 = .42$					$\Delta R^2 = .19$						
Step 1													
1	Relationship length	.01	-.12	.14	0.10	.917	1	.06	-.07	.18	0.87	.389	
2	Relationship satisfaction	.08	-.06	.23	1.13	.262	2	-.09	-.24	.05	-1.22	.225	
3	Intrinsic	<b>.49</b>	<b>.41</b>	<b>.57</b>	<b>12.05</b>	<b>&lt; .001</b>	3	<b>-.12</b>	<b>-.21</b>	<b>-.03</b>	<b>-2.60</b>	<b>.010</b>	
4	Introjected	<b>-.23</b>	<b>-.31</b>	<b>-.14</b>	<b>-5.20</b>	<b>&lt; .001</b>	4	<b>.29</b>	<b>.19</b>	<b>.39</b>	<b>5.80</b>	<b>&lt; .001</b>	
5	External	<b>-.17</b>	<b>-.25</b>	<b>-.08</b>	<b>-3.84</b>	<b>&lt; .001</b>	5	<b>.11</b>	<b>.01</b>	<b>.21</b>	<b>2.19</b>	<b>.029</b>	
6	Spontaneous	.03	-.04	.10	0.86	.388	6	.05	-.03	.13	1.16	.248	

Relationship length and satisfaction were defined at Level 2; silence motives were defined at Level 1. Results are bolded where type of silence has a statistically significant relation with affective correlates

relationship length and relationship satisfaction as controls when predicting silence-related affect. For silence-related autonomy, relatedness, and IOS, we controlled for relationship-level autonomy, relatedness, and IOS, respectively. Grand-mean centering across all variables resulted in Level 1 intercepts that control for these Level 2 predictors (Nezlek & Mroziński, 2020).

**Affective and relationship quality correlates** Complementing Study 1, as can be observed in Table 7, daily experiences of intrinsically motivated silence corresponded with more experience of calm and happiness in silence (low- and high-arousal positive affect), and less experience of sadness and anxiety in silence (low- and high-arousal negative affect). Summarized in Table 8, intrinsically motivated silence also positively correlated with feeling autonomy and relatedness when experiencing silence with partner on the day. In contrast, introjected and externally motivated silence were both negatively associated with daily calmness and happiness in silence, positively related to daily sadness and anxiety in silence, and linked to lower experience of autonomy and relatedness in silence with partner (see Tables 7 and 8). Whereas the links with intrinsically motivated silence conceptually replicated findings of Study 1, there was more support for Hypothesis 3 regarding the negative relations with externally motivated silence in this study. This discrepancy may have resulted from recollections of silence being more immediate, and at the daily level rather than broadly retrospective. As in Study 1, spontaneous silence showed inconsistent positive relations; most robustly, it was linked

with need satisfactions for autonomy and relatedness, and more felt closeness to partners.

## Discussion

The fourteen-day diary study explored daily occurrences of motives for silence and its experience in an experiential setting that allowed us to examine silence as it occurred. With larger samples of silence experiences, we observed some clear and larger effect sizes of how different motives of silence related to experiences in silence with romantic partners. In this setting, we saw that, on days in which participants reported more intrinsically motivated silence, and also less introjected silence, they also reported more positive and lower negative affect within their silence with partners, and greater need satisfaction. At the daily level, we observed relations of externally motivated silence with positive affect and relationship quality outcomes, which had not been evident in Study 1.

## Study 3

Study 3 expanded on the previous ones in four ways. The most important of these was that, through this study, we sought experimental evidence linking motives for silence to outcomes observed correlationally in Studies 1 and 2. To do this, we randomly assigned participants to each of four conditions asking them to reflect on one of the four types of silence identified in previous studies. Such reflections have

**Table 8** Study 2 multilevel analyses predicting relationship quality variables from silence motives and control variables

		$\beta$	95% CI		$t$	$p$
			lower	upper		
Silence-related autonomy NS $\Delta R^2 = .52$						
1	Relationship length	.01	-.09	.12	0.27	.787
2	Relationship-level autonomy	.14	.03	.25	2.55	.013
3	Intrinsic	<b>.25</b>	<b>.18</b>	<b>.32</b>	<b>7.20</b>	<b>&lt; .001</b>
4	Introjected	<b>-.39</b>	<b>-.46</b>	<b>-.32</b>	<b>-1.41</b>	<b>&lt; .001</b>
5	External	<b>-.20</b>	<b>-.27</b>	<b>-.12</b>	<b>-5.21</b>	<b>&lt; .001</b>
6	Spontaneous	<b>.08</b>	<b>.02</b>	<b>.14</b>	<b>2.66</b>	<b>.008</b>
Silence-related relatedness NS $\Delta R^2 = .58$						
1	Relationship length	.03	-.06	.12	0.70	.485
2	Relationship-level relatedness	.18	.09	.28	3.59	.001
3	Intrinsic	<b>.44</b>	<b>.37</b>	<b>.51</b>	<b>12.62</b>	<b>&lt; .001</b>
4	Introjected	<b>-.21</b>	<b>-.29</b>	<b>-.14</b>	<b>-5.54</b>	<b>&lt; .001</b>
5	External	<b>-.28</b>	<b>-.35</b>	<b>-.20</b>	<b>-7.25</b>	<b>&lt; .001</b>
6	Spontaneous	<b>.07</b>	<b>.01</b>	<b>.13</b>	<b>2.23</b>	<b>.026</b>
Daily IOS $\Delta R^2 = .41$						
1	Relationship length	.01	-.13	.14	0.09	.927
2	Conversation-level IOS	.55	.41	.69	7.45	.000
3	Intrinsic	<b>.25</b>	<b>.18</b>	<b>.32</b>	<b>6.72</b>	<b>&lt; .001</b>
4	Introjected	<b>-.13</b>	<b>-.20</b>	<b>-.05</b>	<b>-3.22</b>	<b>.001</b>
5	External	-.08	-.15	.00	-1.95	.051
6	Spontaneous	.00	-.07	.06	-0.12	.902

Relationship length and relationship-level correlates were defined at Level 2; silence motives were defined at Level 1. Results are bolded where type of silence has a statistically significant relation with affective correlates. “relationship-level” refers to the relationship level variable corresponding to the outcome being tested in the particular model. For example, for IOS, it refers to the degree of IOS with one's partner in general when predicting IOS within silence. \*\*When controlling for relationship satisfaction, the models predicted 56%, 61%, and 41% of the variance in the three outcomes, effectively 0, 1, and 0% more than predicted by the original variables

been used successfully in past research (Aguinis & Bradley, 2014) and show effects comparable with other experimental designs, for example, in manipulating salience of trust (Bauer & Freitag, 2018), autonomy-support (Weinstein et al., 2017), and listening (Itzchakov et al., 2020). Second, the previous studies focused on general event recollections of silence, rather than a particular episode of silence – an event-specific memory. Both types of self-knowledge occur in a hierarchy (Conway & Pleydell-Pearce, 2000), and both are meaningful cognitive representations of our experiences (Barsalou, 1988). Although summarized events such as those used in previous studies are commonly used to capture recollections of meaningful past experiences, specific events may have more distinctive characteristics that could influence the nature of relationships between variables under study (Conway, 1992, 1996). Therefore, the experimental manipulation used in this study asked participants to reflect on a specific event within their relationship. A third change of this study is that, although we controlled for relationship-level need satisfaction and IOS in previous studies, we did not account for relationship-level affect that allows for a

more precise differentiation from silence-specific affect. As such, in this study we measured affect at the relationship level, along with other relationship-level controls. Finally, in this study we explored potential implications for silence on global evaluation of the relationship (Knee & Petty, 2013), an outcome that yields itself more readily to being tested in an experimental paradigm where the causal direction can be readily inferred.

## Method

### Participants

As registered, we posted 200 slots participants to test a four-condition experiment, allowing dropout and requiring samples of  $n=45$  to achieve a power of 0.80 for effect size  $d=0.50$ . Despite this, after excluding the pre-registered exclusion criterion of ability to recall a time of silence (i.e., “I could/could NOT recall instances of silences such as the one described to me in the instructions”), the final sample

comprised of 173 eligible participants (75 (43.4%) men, 87 (56.6%) women).

Participants were between the age of 18 and 65+ years ( $M_{\text{age}} = 37.04$  years,  $SD = 12.23$ ), and were recruited through Prolific Academic and compensated monetarily; we selected for individuals who identified themselves to be in a committed relationship for at least one year. Relationship length varied from one year to over ten years ( $M_{\text{length}} = 9.73$  years,  $SD = 3.22$ ). One (0.6%) participant identified that they were dating, 76 (43.9%) that they were in a steady relationship, 12 (6.9%) were engaged, and 84 (48.6%) were married.

### Procedure and materials

Participants completed surveys as in previous studies: Relationship-level scales included: autonomy and relatedness need satisfaction ( $\alpha = 0.82 - 0.88$ ), relationship-level IOS ( $M = 5.10$ ,  $SD = 1.57$ ), and relationship satisfaction ( $\alpha = 0.95$ ). In this study, participants also completed the affect scale used in relation to silence within previous studies, but this time reference-shifted to ask about the relationship, on the whole ( $\alpha = 0.83 - 0.90$ ). These baseline scales were presented in a randomized order.

Following this, participants received instructions based on random assignment to one of four conditions reflecting the four forms of silence of interest to this research. Based on assignment to condition, they then received one of four sets of instructions prefaced with, “There are many reasons why moments of silence occur in a relationship; at times they are pretty neutral, and other times they can be unpleasant or pleasant. Please think back to a time when you were silent when with your partner...” The Intrinsically motivated silence condition further described: “because it was fun, enjoyable, and added to the feeling of intimacy between you and your partner.” The Introjected silence condition described: “because you felt inhibited, were afraid to express yourself, or didn’t know the correct thing to say.” The Externally motivated silence condition further described: “because you wanted your partner to feel bad or punish him/her, or you felt he or she was forcing you to be silent,” and finally the Spontaneous silence condition described: “for no reason at all, it just happened that way.”

Participants spent one minute reflecting on, and writing about, this situation. They then completed the longer, 18-item version of the motives for silence scale described in Study 1: intrinsically motivated silence ( $\alpha = 0.93$ ), introjected silence ( $\alpha = 0.90$ ), externally motivated silence ( $\alpha = 0.71$ ), spontaneous silence ( $\alpha = 0.72$ ). Affect in silence were tested using the 12-item affect scale from Study 1, which showed acceptable internal reliability here, low-arousal positive ( $\alpha = 0.97$ ), low-arousal negative ( $\alpha = 0.77$ ), high-arousal positive ( $\alpha = 0.89$ ), and high-arousal negative

( $\alpha = 0.93$ ). As in the previous study, we measured the relationship quality indicators of autonomy psychological need satisfactions ( $\alpha = 0.89$ ), relatedness need satisfaction ( $\alpha = 0.94$ ), and IOS ( $M = 4.06$ ,  $SD = 2.01$ ) in silence.

**Representativeness of silence types** Participants were provided the single item: “How representative are these types of silence in your relationship?,” and responded on a scale from 1 (*not at all*) to 5 (*very representative*);  $M = 2.50$ ,  $SD = 1.05$ .

**Silence contribution to the relationship** Contribution to the relationship was measured with a single item: “Do you feel such moments of silences...?,” paired with a 5-point Likert-type scale (*worsened the relationship*), 3 (*did not influence the condition of the relationship*), and 5 (*improved the relationship*). On average, participants reported very little influence,  $M = 3.17$ ,  $SD = 1.36$ .

## Results

### Portrayal of silence and its motives

**Correlates of motives for silence** Table 9 presents zero-order correlations. In this study, all three forms of motivated silence (now tested as manipulation checks) correlated in expected directions and robustly with both affect and relationship quality within silence ( $rs = \pm 0.30 - .71$ ). This time, spontaneous silence was also consistently related to more positive correlates ( $rs = \pm 0.22 - 0.50$ ). In this study, both intrinsic and spontaneous silence were linked to more positive and less negative affect, and more positive relational experiences in both silence and conversations. Both introjected and externally motivated silence showed links with less positive affect and relationship quality experiences.

### Preliminary analyses

**Analytic approach** For preliminary, and pre-registered analyses below, we conducted an analysis of variance (ANOVA) predicting each outcome, and controlling for length of relationship.

**How representative is each motive for silence in long-term relationship?** When comparing how representative is each type of silence in the relationship, the omnibus effect across the three dummy codes was significant,  $F(3, 165) = 6.48$ ,  $p < 0.001$ ,  $r^2 = 0.11$ . Planned dummy codes showed that introjected silence was less representative in long-term relationship compared to intrinsically motivated silence,  $\beta = -0.27$ ,  $t(165) = -3.18$ ,  $p = 0.002$ ,  $pr = -0.23$ . Compared to intrinsically motivated silence, externally motivated silence was also less representative in long-term relationship,

**Table 9** Study 3 descriptives and zero-order correlations between self-reported variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. <i>Intrinsic</i>	3.88	1.61	–										
2. <i>Introjected</i>	2.65	1.50	-.54***	–									
3. <i>External</i>	2.10	1.26	-.31***	.59***	–								
4. <i>Spontaneous</i>	3.59	1.63	.52***	-.30***	-.18**	–							
5. <i>Rel. sat</i>	4.69	1.32	.27***	-.23**	-.17*	-.06	–						
6. <i>Low positive</i>	3.08	1.53	.79***	-.67***	-.48***	.50***	.25***	–					
7. <i>Low negative</i>	1.92	1.01	-.50***	.67***	.58***	-.27***	-.22**	-.59***	–				
8. <i>High positive</i>	2.26	1.22	-.53***	.71***	.54***	-.42***	-.11	-.72***	.81***	–			
9. <i>High negative</i>	2.06	1.23	.71***	-.49***	-.27***	.39***	.31***	.75***	-.43***	-.47***	–		
10. <i>Aut.NS</i>	5.14	1.57	.62***	-.74***	-.46***	.35***	.29***	.73***	-.62***	-.67***	.55***	–	
11. <i>Related. NS</i>	4.51	1.92	.73***	-.69***	-.46***	.38***	.42***	.83***	-.70***	-.71***	.68***	.83***	–
12. <i>IOS</i>	4.17	2.05	.54***	-.53***	-.33***	.22**	.43***	.62***	-.54***	-.54***	.54***	.57***	.74***

Pos and neg = positive and negative affect. Rel.sat = relationship satisfaction. Aut. NS = autonomous need satisfaction; Related. NS = relatedness need satisfaction. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

$\beta = -0.29$ ,  $t(165) = -3.38$ ,  $p = 0.001$ ,  $pr = -0.25$ , but spontaneous silence did not show any difference,  $\beta = -0.04$ ,  $t(165) = -0.17$ ,  $p = 0.869$ ,  $pr = -0.01$ .

**Manipulation checks** Manipulation checks tested whether dummy coded condition predicted higher levels of the corresponding types of silence in terms of their self-reports. The Intrinsically motivated silence condition was found to predict higher self-reporting of intrinsically motivated silence as compared to all other conditions,  $\beta_s = -0.59$  to  $-0.15$ ,  $ts(165) > -2.11$ ,  $ps < 0.037$ ,  $prs = -0.13$  to  $-0.50$ , the Introjected Silence condition predicted more introjected silence than the Intrinsically motivated silence condition to which it is compared,  $\beta = 0.68$ ,  $t(165) = 10.50$ ,  $p < 0.001$ ,  $pr = 0.59$ , as did the Externally motivated silence condition predicting externally motivated silence,  $\beta = 0.66$ ,  $t(165) = 9.42$ ,  $p < 0.001$ ,  $pr = 0.57$ . However, there was no difference between the Spontaneous and Intrinsically motivated silence conditions predicting self-reported spontaneous silence,  $\beta = 0.07$ ,  $t(165) = 0.87$ ,  $p = 0.387$ ,  $pr = 0.06$ . In sum, conditions elicited higher self-reports of the types of silence they were meant to elicit. The only exception was that, although the Spontaneous silence condition was felt to be less intrinsic than the Intrinsically motivated silence condition (as expected), both were felt to be similarly spontaneous; this finding might have been expected since the most important quality that differentiates the two types of silence is the depth of intimacy characterizing them.

**Silence contribution to the relationship: does silence contribute in positive or negative ways to the relationship?** A multiple regression analysis regressing this variable on dummy coded conditions indicated an overall effect of condition;  $F(3, 165) = 10.89$ ,  $p < 0.001$ ,  $r^2 = 0.17$ . As compared to

Intrinsically motivated silence, the Introjected silence condition reported that these types of silence worsened their relationship,  $\beta = -0.39$ ,  $t(165) = -4.73$ ,  $p < 0.001$ ,  $pr = -0.34$ ; as did those in the Externally motivated silence condition,  $\beta = -0.38$ ,  $t(154) = -4.64$ ,  $p < 0.001$ ,  $pr = -0.33$ ; however, no differences were apparent between the Spontaneous and Intrinsically motivated silence conditions,  $\beta = -0.14$ ,  $t(164) = -1.65$ ,  $p = 0.10$ ,  $pr = -0.13$ .

### Preregistered analyses

**Links between motivation for silence and silence-related outcomes** To test confirmatory hypotheses, we entered all four forms of motivation for silence simultaneously. For each silence-related outcome, we controlled for the relationship-related variable that corresponded to the outcome specified in the model: including inclusion of other in self, relationship need satisfaction, and affect. We controlled for relationship length throughout.<sup>3</sup>

Findings are presented in full in Table 10; effects described below are significant at  $p < 0.001$  unless noted otherwise.

Assignment to the Spontaneous silence condition (Dummy 3) did not differ from the Intrinsically motivated silence condition on low-arousal positive affect ( $pr = -0.08$ ,  $p = 0.072$ ), or autonomy need satisfaction ( $pr = -0.11$ ,  $p = 0.060$ ). It did, however, predict less high arousal positive ( $pr = -0.21$ ), and more low-arousal ( $pr = 0.11$ ,  $p = 0.041$ ), and

<sup>3</sup> At this point controlling for relationship satisfaction was unnecessary, since we had relationship-level controls for all DVs. However, we present findings with this additional control in supplementary materials.

**Table 10** Study 3 means and standard deviations for each of four conditions, and slopes for comparison between introjected, external, and spontaneous silence with intrinsic silence

	Total	<i>Intrinsic</i>	<i>Introjected (versus intrinsic)</i>		<i>External (versus intrinsic)</i>		<i>Spontaneous (versus intrinsic)</i>	
	<i>R</i> <sup>2</sup>	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	$\beta$ , <i>t</i>	<i>M</i> ( <i>SD</i> )	$\beta$ , <i>t</i>	<i>M</i> ( <i>SD</i> )	$\beta$ , <i>t</i>
Low Pos Affect	.63	4.27(0.90)	2.07(1.20)	-.61, -11.13**	1.57(0.99)	-.70, -12.91**	3.86(1.14)	-.10, -1.81
High Pos Affect	.52	1.22(0.42)	2.30(0.94)	-.61, -9.66**	2.86(1.04)	-.57, -9.09**	1.62(0.73)	-.24, -3.84**
Low Neg Affect	.52	3.20(0.98)	1.51(0.83)	.43, 6.83**	1.42(1.01)	.57, 8.94**	2.55(1.00)	.13, 2.05*
High Neg Affect	.59	1.12(0.32)	2.78(1.18)	.56, 9.62**	3.45(1.05)	.72, 12.30**	1.56(0.81)	.12, 2.01*
Autonomy NS	.49	6.20(0.83)	3.86(1.65)	-.61, -9.31**	4.25(1.38)	-.49, -7.64**	5.70(1.17)	-.12, -1.91
Relatedness NS	.62	5.93(1.21)	3.29(1.76)	-.55, -9.82**	2.80(1.31)	-.62, -11.04**	5.22(1.56)	-.15, -2.71**
IOS silence	.52	5.42(1.51)	3.05(1.82)	-.46, -7.34**	2.77(1.70)	-.51, -8.30**	4.44(1.75)	-.17, -2.72**

Findings are controlling for the same measures in relationship and relationship length

\*\* $p < .001$ , \* $p < .05$

high-arousal negative ( $pr = 0.10$ ,  $p = 0.046$ ) affect. Further, it predicted less relatedness need satisfaction ( $pr = -0.13$ ,  $p = 0.007$ ), and lower IOS ( $pr = -0.15$ ,  $p = 0.007$ ). These findings partially supported Hypothesis 1 regarding the beneficial effects of intrinsically motivated silence, when intrinsically motivated silence was compared to spontaneous silence.

Further, assignment to the Introjected versus Intrinsically motivated silence condition (Dummy 1) predicted lower low-arousal positive ( $pr = -0.53$ ) and lower high-arousal positive ( $pr = -0.52$ ) affect, and more low-arousal negative ( $pr = 0.37$ ) and more high-arousal negative ( $pr = 0.49$ ) affect. Further, the Introjected silence condition predicted lower autonomy ( $pr = -0.52$ ) and relatedness ( $pr = -0.48$ ) need satisfaction, and lower IOS ( $pr = -0.39$ ); these findings fully supported Hypothesis 2 regarding the detrimental effects of introjected silence.

Finally, assignment to the External versus Intrinsically motivated silence condition (Dummy 2) also predicted less low-arousal positive ( $pr = -0.61$ ) and less high arousal positive ( $pr = -0.49$ ), and more low arousal negative ( $pr = 0.48$ ), and more high arousal negative ( $pr = 0.62$ ) affect. Further, the External condition predicted less autonomy ( $pr = -0.43$ ) and relatedness ( $pr = -0.54$ ) need satisfaction, and lower IOS ( $pr = -0.45$ ). These findings fully supported Hypothesis 3 regarding the detrimental effects of externally motivated silence.

## Conclusions

Study 3 found experimental support that reflecting back to a specific episode of silence shared with a romantic partner predicted affect and relationship quality indicators as a function of the type of silence recalled. Findings showed robust differences between introjected and externally motivated

forms of silence as reducing positive, and increasing negative affect, reducing autonomy and relatedness need satisfaction, and lower inclusion of other within self. The effects of spontaneous silence were more varied, but in this study we found that intrinsically motivated silence was higher than spontaneous silence in high arousal positive affect, lower on both low and high arousal negative affect, and higher on two measurements of relationship quality (IOS, relatedness need satisfaction).

## Study 4

Across three studies we identified largely consistent effects of intrinsically motivated silence benefiting experiences within silence. On the other hand, findings for introjected silence, and even more so externally motivated silence, were mixed. Their unadjusted associations with both affect and relationship quality in silence were fairly modest, and their contributions in models simultaneously testing them alongside our other proposed forms of silence and relationship-level controls found inconsistent findings: at times they related to our outcomes in predicted directions, and at other times they did not. This was especially true in the case of externally motivated silence, which on a number of occasions did not show a statistically significant effect when other forms of silence were considered. Possibly, weaker findings were due to floor effects in these constructs – participants reported them, and especially externally motivated silence, at low rates and felt they were less representative of their relationships.

To increase the likelihood that participants are able to recall maladaptive interactions in their romantic relationships, we selected to test the role of silence in *past* romantic relationships, and even more specifically in *bad* romantic relationships of the past. Therefore, following

the successful manipulation of silence reflections within the context of a current relationship, Study 4 tried to get at the elusive negative forms of silence by directly recruiting participants whose bad relationship had ended, to isolate the role of silences in these experiences of the past.

A second reason that externally motivated silence showed weaker correlations in previous studies (particularly Study 1) may have been that the scale used included fewer items and was less reliable than the other subscales, as two of the items initially intended for this subscale were found to better reflect introjected silence (see Study 1). Furthermore, the external items employed in Study 2 were relatively negatively valenced. In Study 4, we added items to address the concern this reflected a broad relationship positivity bias. Although we once again relied on an experimental design with conditions, rather than the survey itself, defined as the predictors, our manipulation check in this study included three new items developed to better test externally motivated silence in romantic relationships.

## Method

### Participants

We registered that 200 slots would be provided to test this four condition experiment as in the previous study, but collected 220 following lower than expected rates of eligible participants in the previous study (11.4% reported they couldn't recall the type of instance in the manipulation – that number did not change between conditions, though it was slightly higher in the Externally motivated silence condition (10% Intrinsically motivated; 7.8% Introjected; 16.3% Externally motivated; 11.1% Spontaneous); and 13.6% had not had a past relationship). After excluding the pre-registered exclusion criterion of ability to recall a time of silence in a past relationship, the final sample comprised 165 eligible participants (20 (12.1%) men, 145 (87.9%) women).

Participants between the age of 18 and 40 years ( $M_{\text{age}} = 19.61$  years,  $SD = 2.52$ ) were recruited for a study about their “worst past relationship.” Participants were students and compensated with credit, and only those who had a romantic relationship in the past took part (though they were included regardless of how ‘bad’ they saw the past relationship to be). The previous relationship about which participants thought varied from one month to ten years ( $M_{\text{length}} = 1.16$  years,  $SD = 1.29$ ).

### Procedure and materials

Participants completed scales as in previous studies: Relationship need satisfaction scale ( $\alpha = 0.77 - 0.84$ ), relationship-level IOS ( $M = 3.54$ ,  $SD = 2.87$ ), relationship satisfaction ( $\alpha = 0.90$ ), and relationship-level affect

( $\alpha = 0.73 - 0.89$ ). These baseline scales were presented in a randomized order. Following this, participants received instructions based on random assignment to one of four conditions reflecting the four forms of silence, using the same instructions as were used in Study 3. As in Study 3, they completed the 18-item version of the motives for silence scale first described in Study 1, and subscales once again showed high internal reliability: intrinsically motivated silence ( $\alpha = 0.92$ ), introjected silence ( $\alpha = 0.91$ ), and spontaneous silence ( $\alpha = 0.92$ ). New to this study, we developed three additional items to measure externally motivated silence, because this subscale had the poorest measurement quality in previous studies. These items were: “Because I wanted revenge for something that that happened,” “Because he or she deserved to feel uncomfortable for a time,” and “Because I wanted to communicate that I felt unhappy.” The now six-item subscale showed high internal reliability ( $\alpha = 0.92$ ), and differentiated from other forms of silence in an exploratory factor analysis with no cross-loading above 0.45.

Alongside motives for silence, affect within silence was tested using the 12-item affect scale used in previous studies, which showed acceptable internal reliability here, low-arousal positive ( $\alpha = 0.95$ ), low-arousal negative ( $\alpha = 0.76$ ), high-arousal positive ( $\alpha = 0.87$ ), and high-arousal negative ( $\alpha = 0.87$ ). As in the previous study, we measured the relationship quality indicators of autonomy psychological need satisfactions ( $\alpha = 0.84$ ), relatedness need satisfaction ( $\alpha = 0.88$ ), and IOS ( $M = 2.87$ ,  $SD = 1.75$ ) in silence. Similar to Study 3, we measured the representativeness of the recalled silence type – a function of condition – within the recalled relationship.

**Contribution to the relationship** In this study, we measured perceived silence contribution to the relationship now with three items, all standardized and averaged after they showed acceptable internal reliability ( $\alpha = 0.77$ ). The first item was identical to Study 3 and asked participants: How did moments of silence such as this one (1 = *worsen the relationship*; 3 = *did not influence the relationship*; 5 = *improved your relationship*). For the purposes of this study, this item was reverse coded. Second, participants were asked “How much do you feel that these types of silences, shared between you and your partner, contributed to your breaking up?” using a scale from 1 = *not at all* to 5 = *very much*. Finally, participants responded to the item: “How much do you regret the way you used silence to communicate” using a scale from 1 = *no regret* to 7 = *fully regret*. The last item measuring regret was also used at the relationship-level, to assess overall relationship regret, with the stem “How much do you regret the relationship, on the whole.” This additional item, which showed moderate levels of relationship regret on the whole ( $M = 3.70$ ,  $SD = 2.09$ ), was included as a control



**Table 11** Study 4 descriptives and zero-order correlations between self-reported variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. <i>Intrinsic</i>	3.12	1.47	–										
2. <i>Introjected</i>	3.85	1.66	-.60***	–									
3. <i>External</i>	2.91	1.63	-.47***	.51***	–								
4. <i>Spontaneous</i>	3.49	1.75	.45***	-.32***	-.33***	–							
5. <i>Rel. sat</i>	2.22	1.17	.31***	-.30***	-.06	.07	–						
6. <i>Low positive</i>	2.18	1.24	.73***	-.64***	-.49***	.39***	.25**	–					
7. <i>Low negative</i>	2.72	1.10	-.62***	.60***	.48***	-.31***	-.25**	-.61***	–				
8. <i>High positive</i>	1.80	0.98	-.61***	.69***	.54***	-.32***	-.26***	-.69***	.76***	–			
9. <i>High negative</i>	2.86	1.22	.61***	-.56***	-.41***	.25**	.19*	.75***	-.57***	-.56***	–		
10. <i>Aut.NS</i>	3.77	1.70	.56***	-.77***	-.34***	.28***	.49***	.59***	-.57***	-.58***	.51***	–	
11. <i>Related. NS</i>	3.13	1.66	.75***	-.65***	-.48***	.26***	.41***	.70***	-.64***	-.64***	.65***	.71***	–
12. <i>IOS</i>	2.72	1.69	.43***	-.29***	-.30***	.06	.34***	.38***	-.24**	-.34***	.29***	.34***	.55***

Pos and neg = positive and negative affect. Rel.sat = relationship satisfaction. Aut. NS = autonomous need satisfaction; Related. NS = relatedness need satisfaction. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

variable in the model predicting silence contribution to the relationship.

## Results

### Preliminary analyses

**Correlates of motives for silence** Table 11 presents zero-order correlations between outcomes. All self-reported forms of silence that comprised our manipulation check in this study correlated with affect, need satisfaction, and IOS in silence in expected directions ( $r_s = \pm 0.29$ – $0.77$ ). The only exception was that there was no statistically significant link between spontaneous silence and IOS ( $r = 0.06$ ). Notably, even in bad past relationships, spontaneous silence correlated positively with positive affect, and particularly: low-arousal positive affect ( $r = 0.39$ ), other affect types ( $r = \pm 0.25$ – $0.32$ ).

**Analytic approach** As in Study 3, dummy codes compared Introjected, External, and Spontaneous Silence conditions with the Intrinsically motivated silence condition. These were modeled simultaneously in linear regression analyses.

**How representative are the motives for silence in long-term relationships?** A multiple regression analysis regressing frequency on dummy coded conditions indicated that the type of silence described across conditions did not show significant difference in how representative they were in past relationships,  $F(3, 156) = 2.35$ ,  $p = 0.074$ ,  $r^2 = 0.04$ .

**Manipulation checks** Manipulation checks tested whether dummied variables predicted higher levels of the corresponding types of silence. The Intrinsically motivated silence condition was found to predict higher self-reporting of intrinsically motivated silence as compared to all other conditions,  $\beta_s = -0.58$  to  $-0.35$ ,  $t_s(157) > -4.26$ ,  $p_s < 0.001$ ,  $pr_s = -0.48$  to  $-0.29$ . The Introjected silence condition predicted more introjected silence,  $\beta = 0.53$ ,  $t(157) = 6.23$ ,  $p < 0.001$ ,  $pr = 0.44$ , as did the Externally motivated silence condition predicting externally motivated silence,  $\beta = 0.68$ ,  $t(157) = 8.58$ ,  $p < 0.001$ ,  $pr = 0.56$ . However, as was the case in Study 3, there was no difference between the Spontaneous and Intrinsically motivated silence conditions predicting self-reported spontaneous silence,  $\beta = -0.001$ ,  $t(157) = -0.02$ ,  $p = 0.987$ ,  $pr = -0.00$ . In sum, conditions elicited higher self-reports of the types of silence they were meant to elicit. The only exception was the Spontaneous Silence condition, although as expected, it elicited lower intimacy as compared to the Intrinsically motivated condition.

**Silence contribution to the relationship: does silence contribute in positive or negative ways to the relationship?** A first model regressed the perceived negative contribution of silence to relationships, controlling for relationship-level regret. The predictors together accounted for significant outcome in silence contribution to the relationship,  $F(3, 156) = 17.02$ ,  $p < 0.001$ ,  $r^2 = 0.30$ . As compared to Intrinsically motivated silence, participants in the Introjected silence condition reported these types of silence contributed negatively to the relationship,  $\beta = 0.40$ ,  $t(156) = 4.88$ ,  $p < 0.001$ ,  $pr = 0.33$ ; as did those in the Externally motivated silence condition,  $\beta = 0.35$ ,  $t(156) = 4.28$ ,  $p < 0.001$ ,  $pr = 0.29$ ; and those in the Spontaneous silence condition,  $\beta = 0.27$ ,  $t(156) = 3.38$ ,  $p = 0.001$ ,  $pr = 0.22$ . In short,

**Table 12** Study 4 means and standard deviations for each of four conditions, and slopes for comparison between introjected, external, and spontaneous silence with intrinsic silence

	Total	<i>Intrinsic</i>	<i>Introjected (versus intrinsic)</i>		<i>External (versus intrinsic)</i>		<i>Spontaneous (versus intrinsic)</i>	
	$R^2$	$M(SD)$	$M(SD)$	$\beta, t$	$M(SD)$	$\beta, t$	$M(SD)$	$\beta, t$
Low Pos Affect	.35	3.20(1.20)	1.55(0.76)	-.59, -7.34**	1.54(0.65)	-.57, -7.26**	2.36(1.36)	-.22, -3.80**
Hi Pos Affect	.33	2.10(1.18)	3.05(0.87)	-.48, -5.84**	3.21(0.80)	-.49, -6.10**	2.60(1.16)	-.31, -3.80**
Low Neg Affect	.32	2.52(1.09)	1.40(0.70)	.31, 3.82**	1.34(0.61)	.38, 4.74**	1.83(0.96)	.19, 2.34*
Hi Neg Affect	.37	2.05(1.15)	3.30(1.02)	.41, 5.26**	3.45(0.91)	.44, 5.70**	2.77(1.28)	.24, 3.13**
Autonomy NS	.62	4.52(1.61)	3.03(1.41)	-.28, -4.56**	3.43(1.52)	-.24, -3.92**	3.97(1.90)	-.13, -2.09*
Relatedness NS	.46	4.37(1.77)	2.46(1.15)	-.48, -6.50**	2.39(1.16)	-.48, -6.60**	3.18(1.71)	-.29, -4.89**
IOS silence	.39	3.41(1.75)	2.56(1.70)	-.28, -3.62**	2.26(1.46)	-.34, -4.50**	2.68(1.67)	-.20, -2.56*

\*\* $p < .01$ , \* $p < .05$ 

Controlling for the same measures in relationship and relationship length

participants reported that intrinsically motivated silence made a more positive contribution to their relationship from the past.

### Preregistered analyses

**Links between motivation for silence and silence-related outcomes** In line with pre-registered plans, we entered all four forms of motivation for silence simultaneously. For each silence-related outcome, we controlled for the relationship-related variable that corresponded to the outcome specified in the model: affect or need satisfaction with one's partner or inclusion of other in self. In all cases, we controlled for relationship length, though results were identical in significance and direction when also controlling for relationship satisfaction. Findings are presented in full in Table 12.

Assignment to the Introjected versus Intrinsically motivated silence predicted lower low-arousal positive ( $pr = -0.48$ ,  $p < 0.001$ ) and high-arousal positive ( $pr = -0.39$ ,  $p < 0.001$ ) affect, and reported more low-arousal negative ( $pr = 0.25$ ,  $p < 0.001$ ) and high-arousal negative ( $pr = 0.33$ ,  $p < 0.001$ ) affect, lower satisfaction of autonomy need ( $pr = -0.23$ ,  $p < 0.001$ ) and related need ( $pr = -0.39$ ,  $p < 0.001$ ) satisfaction. Furthermore, Introjected silence participants reported lower IOS ( $pr = -0.23$ ,  $p < 0.001$ ). In sum, findings supported Hypothesis 2, that introjected silence would be experienced in detrimental ways. In this study, the hypothesis was tested in relation to intrinsically motivated silence.

Assignment to the External versus Intrinsically motivated silence condition also predicted lower low-arousal positive ( $pr = -0.47$ ,  $p < 0.001$ ), high arousal positive ( $pr = -0.40$ ,  $p < 0.001$ ), and more low arousal negative ( $pr = 0.32$ ,  $p < 0.001$ ), and high arousal negative ( $pr = 0.35$ ,  $p < 0.001$ ) affect. Also, less autonomy need ( $pr = -0.19$ ,  $p < 0.001$ ) and relatedness need ( $pr = -0.39$ ,  $p < 0.001$ ) satisfaction, and IOS

( $pr = -0.28$ ,  $p < 0.001$ ). In sum, findings supported Hypothesis 3, that externally motivated silence would be experienced in detrimental ways.

Finally, assignment to the Spontaneous silence condition predicted less low arousal positive affect than the Intrinsically motivated silence condition ( $pr = -0.25$ ,  $p < 0.001$ ), less high arousal positive ( $pr = -0.25$ ,  $p < 0.001$ ), and more low arousal negative ( $pr = 0.16$ ,  $p = 0.02$ ), and more high arousal negative ( $pr = 0.19$ ,  $p = 0.004$ ) affect. It also predicted less autonomy need satisfaction ( $pr = -0.10$ ,  $p = 0.04$ ), relatedness need satisfaction ( $pr = -0.23$ ,  $p < 0.001$ ), and less IOS ( $pr = -0.16$ ,  $p = 0.011$ ). Therefore, unlike in Study 3 the Intrinsically motivated silence condition now consistently predicted more positive experiences in comparison to the Spontaneous silence condition, fully supporting Hypothesis 1.

### Conclusions

In Study 4, we examined the intrapersonal and interpersonal correlates of silence once again, this time asking participants to reflect back to a bad relationship of the past, and to report on an experience of silence within that relationship, this time using a more comprehensive measure of externally motivated silence motives. In this study, we found that relationships were characterized equally by constructive and destructive forms of silence. We also found robust effects of both introjected and external motives for silence as a regretful aspect of the relationship that contributed to breakups. Finally, in our confirmatory analyses replicating previous studies, we found robust effects of both the Introjected and Externally motivated silence conditions on all affective and relationship quality outcomes, and significant, though weaker effects for the Intrinsically motivated silence condition to predict better outcomes for participants and their interpersonal experiences within the relationship.

## General Discussion

Little is understood about silence in interpersonal interactions and in romantic relationships, yet it has been argued that silence is an important social tool (Bruneau, 1973; Kenny, 2018), and a unique form of communication in relationships that should be understood in terms of its differentiating characteristics. In four studies, we explored the role of silence to understand its role in romantic relationships. We explored the possibility that not all silence is the same and modeled motives of silence that may be adaptive (intrinsically motivated silence), maladaptive (introjected and externally motivated silence), and amotivated (spontaneous silence). Given that the topic has received relatively little attention, we built understanding through a first cross-sectional study, which we followed with an ecological momentary assessment (daily diary study) to examine correlations at the within-person, daily level. Finally, we used experimental methods to build causal evidence for the role of silence motives in the experience of silence. Findings, on the whole, highlighted that while much empirical attention has been given to verbal conversation and action, moments of silence appear to play an important role in coloring relationships and can underly intimacy.

### Main findings

Our primary interest was in conservative models predicting experiences within solitude as a function of the four forms of silence modeled simultaneously. Findings across four studies were generally consistent in the case of intrinsically motivated silence: sharing moments of silence motivated by intimacy related to more recalled, daily, and presently experienced positive and less negative affect, more autonomy and relatedness need satisfaction, and more self-other overlap felt during the shared silence.

Across studies, there was also substantial evidence that introjected silence contributed to lower positive and more negative affect. In correlational analyses, introjected silence did not much influence high arousal positive affect, likely because self-inhibition and positive activation are fairly orthogonal experiences when compared to low-arousal affect, more broadly, which tends to be experienced in low-stimulation environments (Nguyen et al., 2018). Introjected silence also related to lower feeling of need satisfaction, and relatedness need satisfaction, in particular: Individuals felt less interpersonal closeness when their silence was self-introjected.

The least consistent findings against expectations were for externally motivated silence, which failed to relate to affect or relationship quality consistently in our first study. Effects for externally motivated silence emerged more consistently in our daily diary design which asked participants to reflect on their experiences in silence during each of fourteen days,

and in experimental paradigms thinking of present, and even more so, relationships of the past. It may be that the external form of silence is less typical across relationships, and rather is more widely used in maladaptive interactions and unhappy relationships.

As we had anticipated, spontaneous silence that is amotivated but occurs naturally showed inconsistent findings. Often, it did not link to affect or relationship quality during silence. On multiple occasions, though, spontaneous silence was recalled as a positive experience, though the nature of that positivity – whether in terms of type of affect or relationship quality, varied from study to study. Notably, spontaneous silence was never found to relate to more *negative* experiences in silence. This finding suggests that silence, in and of itself, may play a generally positive role in romantic exchanges, and is unlikely to be an unpleasant aspect of relationships unless it is motivated in a negative way.

It is worth noting that in general, silence seemed most frequently characterized by low arousal positive affect, followed by high arousal positive affect, and both types of negative affect were the least likely to reflect moments of silence. The pattern comparing positive against negative affect is consistent with findings reviewed above that silence was generally intrinsic, but perhaps the more interesting finding is that silence is characterized by low arousal, even more than high arousal positive affect. This finding is consistent with research findings in the context of solitude, that being alone is more beneficial for peace and relaxation than for more activated positive affect such as happiness and excitement (Nguyen et al., 2018). It seems, then, that silence with romantic partners offers its benefits in terms of shared calm. For this reason, it may be an opportunity for couples to re-center together and to reflect on shared and separate events. Such self-reflection allows partners to gain more knowledge of their internal states and selves in relation to partners (Sedikides & Skowronski, 1995), which may further advantage the relationship (Lewandowski et al., 2010).

The present studies focused on silence shared between partners, a quality of romantic interactions which has received very little empirical attention. Though it is easily thought of as the absence of an interaction, much communication takes place through silence (Jaworski, 1992; Jungkunz, 2013), which carries with it meaning and emotion. While silence has been overlooked in research (Kenny, 2018), it has the potential to influence meaningful relationship outcomes, as reflected in findings of Studies 3–5 that individuals perceived a meaningful contribution of silence to their relationship. Thus, silence can speak to how perceptions of relationships are formed, including intimacy formation (Hendrick et al., 1988), responsiveness (Reis et al., 2004), and trust (Rempel et al., 1985). It therefore has a place of study alongside active communication qualities such as self-disclosure, which has shown to foster intimacy

and wellness within romantic relationships (Gable et al., 2004; Laurenceau et al., 1998; Reis et al., 2010).

### Limitations and future directions

This research is not without limitations. The current studies focused on both short-term and long-term relationships, young adults and older ones. However, both sets of samples were relatively limited in breadth across socioeconomic and cultural factors. While we generally did not find compelling differences between the experiences of silences within these two samples, silence should be understood in community samples of adults, particularly in long-term relationships where patterns of communications are more fully established (Vangelisti, 2002). This is because silence may have more substantial impact on the wellness of relationship partners in these contexts and may predict long-term outcomes.

We also acknowledge that silence in relationships contains both individual and dyadic processes, whereas these studies were limited to individuals. Indeed, relationships motivation theory (RMT; Knee & Browne, 2023; Ryan & Deci, 2017), the most recent mini-theory under self-determination theory, places mutuality and dyadic processes of basic psychological needs satisfaction and frustration, and partner motivations at the center, as does the literature over the past three decades that led to RMT's development. However, studying individuals' perceptions, motivations, and behaviors within the relationship still tells us something important about close relationship processes. To be sure, a next extension of this work could involve specifically designed dyadic studies focused on mutuality of motivations and basic psychological needs with regard to episodes of silence.

Third, the current studies applied self-determination theory (SDT) to define motives of silence, but our operational definitions do not cover all motives or forms of those forms. For example, the studies operationalized external motivation as a negatively valenced set of reasons designed to punish one's partner. The primary exception to this was in Study 4, where we included the additional item: "because my partner said they would spend time with me later". However, future research may consider external motivations for silence more broadly, and balance both positive and negative valenced items. In addition, we did not test all forms of motivation posited by SDT, and future research may consider integrated (i.e., autonomous, self-driven motivation reflecting one's identity and consistent with other values and emotions), and identified (engaged because it is seen to be important) motives for silence (Ryan & Deci, 2000).

In addition, we measured recollections, although Study 2 focused on more recent reflections on silence through daily diary reports. Future research may focus its efforts on understanding silence through lab designs and experiments, through manipulating the relationship dynamics of

interactions by enhancing intimacy or introjection, and then examining downstream effects on silence. Future research that directly elicits or manipulates silence should be conducted with care, so that manipulated experience is reflective of the natural ebb and flow of silence in conversations. In doing so, researchers may explore qualities of silence beyond those offered by SDT and tested in this paper; with relatively little attention paid to such moments as compared to verbalized conversations, deeper questions can be asked about the nature, antecedents, and outcomes of silence. For example, researchers may investigate, when does intimate silence take place, and what does it offer *beyond* words? They may also query whether certain partners, for example those who are securely attached or highly introverted (Aron, 2004; Dekel & Farber, 2012) may be more likely to seek or benefit from intimate forms of silence. These questions would bring further clarity to relationship interactions and their impact on partner well-being.

Further, our studies took place in two individualistic cultures: USA and Britain. However, silence may play different roles in different cultures. Work on the role of silence in discourse, more broadly, suggests that it can have different meanings and outcomes across cultures (Enninger, 1991), and may be subject to complex cultural factors as well as broad cultural norms (e.g., 'silent east' and 'eloquent west'; Nakane, 2007). Research findings outside the context of romantic relationships show differences between modern North American perceptions of silence and how it is understood by the Japanese (Kogure, 2007), Native American (Dumont, 1972), and Amish cultures (Enninger, 1984). For example, it is more likely to reflect politeness (face-saving) in Japanese but not Australian students (Nakane, 2006, 2007), and sensitivity in Chinese, but not US, students (Kenny, 2018).

With these limitations acknowledged, this research also has potential further applications. Outside of the romantic relationship context, silence can be used in therapy to create space for more exploration and to support the expression of affect, where it is conceptualized in terms of metacommunication that takes place between therapist and client (Hill et al., 2019; Hill et al., 2003). Therapists use silence to convey empathy, facilitate reflection, and challenge clients (Ladany et al., 2004), and silence is generally understood to facilitate contemplation (Blanton, 2007). But silence has also been described in terms of both inhibition and hostility in therapeutic contexts (Brown, 2008; Lane et al., 2002; Romano, 1959; Safran et al., 2008; Wilce, 1995). Though silence has received less attention in the context of education, it has been proposed that silence can be thoughtfully introduced to support student agency and encourage student voice (Lausch, 2018); in other words, it may operate similarly in educational as in psychotherapeutic contexts. Thus, close relationship



frameworks may be applied and extended in psychotherapy and education contexts to formalize theories of silence in clinical relationships and change.

Additionally, preliminary work largely in psychotherapy settings suggests that silence may be affected by multitude factors of interest, including personality characteristics such as attachment style (Cutler et al., 2019), and affect disorders such as depressive and anxiety disorders (Lane et al., 2002; Weinberger, 1964). Alongside tests of recalled silence, such as the ones undertaken in the current research, it would be fascinating to examine how people's perceptions of, and responses to, silence depend on their expectations. Mismatches in expectations, which can occur frequently in intercultural interactions, can result not only in subjective feelings of 'uncomfortable silence', but may also lead people to feel they have been 'forced' into silence or have not been 'allowed' to be silent. Thus, there is a plethora of research to be undertaken both in the context of romantic relationships and outside of it, to understand the precursors, experiences, and consequences of silence shared between people.

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## Declarations

**Ethical approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Conflict of interest** The authors declare they have no conflict of interest.

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**Author Note** The full set of materials, data and code used for this and future studies is available for researcher use by request. Studies were pre-registered before data collection on the project page at OSF ([https://osf.io/3gtpu/?view\\_only=9d7df796015d45cfa43c22d3b83c7458](https://osf.io/3gtpu/?view_only=9d7df796015d45cfa43c22d3b83c7458)) (We pre-registered hypotheses and analytic plans for three

additional studies not reported below. Findings from these additional studies are largely consistent with the four studies reported in this paper).