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Spontaneous suppression in dating couples: Social and physiological correlates of suppressing negative and positive emotions during negative and positive conversations

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ABSTRACT

Suppression (i.e., inhibiting one's emotional expression) has typically been associated with social and physiological costs. However, recent theorizing calls into question the inevitability of these costs. The present study takes a more nuanced approach and examines the social and physiological correlates of spontaneous (i.e., uninstructed) suppression when considering two potentially critical factors: the valence of the suppressed emotions (i.e., negative vs. positive) and the valence of the emotional context in which emotions are suppressed (i.e., negative conversation vs. positive conversation). Specifically, dating couples ($N = 196$ couples) completed both a negatively-valenced and a positively-valenced conversation in the laboratory while their autonomic-physiological responses were recorded. After each conversation, participants rated 1) the extent to which they had suppressed their negative and positive emotions, 2) the quality of the conversation, and 3) how connected they felt with their partner. We used Actor-Partner Interdependence Models to estimate actor effects (e.g., association of one's own suppression and one's own connectedness) and partner effects (e.g., association of one's partner's suppression and one's own connectedness). Suppression was associated with lower conversation quality and connectedness for the actors but largely not for the partners, regardless of the valence of the suppressed emotions and of the context, even when adjusting for felt emotion. Additionally, suppression was consistently not associated with physiological responses of actors or partners. Together, these findings suggest that, during emotional conversations with one's romantic partner, spontaneous (unlike instructed) suppression is associated with social but not physiological costs for the self but not one's partner.

1. Introduction

Suppression is an emotion-regulation strategy that involves inhibiting one's emotional expression (e.g., holding back tears when feeling sad). In past research, suppression has consistently been associated with social and physiological costs, including poorer romantic relationship quality and greater sympathetic activation (for reviews, see Chervonsky and Hunt, 2017; Webb et al., 2012). However, there are key gaps in our understanding of suppression. First, much of past work has focused on either short-term effects of instructed suppression (e.g., Gross and Levenson, 1993) or trait-level correlates of habitual suppression (e.g., Gross and John, 2003). In other words, much of our understanding of suppression is *not* based on uninstructed instances of suppression (i.e., spontaneous suppression) and, thus, offers limited insight into how suppression operates when people spontaneously employ it (Diener et al., 2022). Second, little existing research has addressed factors that shape the social and physiological correlates of spontaneous suppression. In particular, the valence of emotions suppressed (i.e., negative vs. positive) and the valence of the emotional context in which emotions are suppressed (i.e., negative vs. positive) could play major roles, yet previous research has not considered these factors simultaneously.

To illustrate, imagine an interaction between romantic partners where one partner suppresses their emotional behavior. To fully understand this instance of suppression, it is important to consider both the

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valence of emotions being suppressed and the valence of the emotional interaction. Is the partner suppressing negative emotions (e.g., anger or sadness) or positive emotions (e.g., joy or amusement)? Are the partners in the midst of a negative interaction (e.g., a disagreement) or a positive interaction (e.g., a loving exchange)? On the one hand, if someone suppresses negative emotions during a disagreement as opposed to suppressing positive emotions during a disagreement, then the interaction might be more productive and less physiologically activating in that it keeps the emotional tone of the disagreement more positive. On the other hand, it is possible that suppression is associated with social and physiological costs – no matter the emotion that is suppressed or the valence of the emotional context – in that it might always be beneficial to authentically express one's emotions. The present work addresses these ideas by examining the social and physiological correlates of romantic partners' spontaneous suppression of negative and positive emotions in two standardized laboratory conversations – a negative conversation (discussing an area of disagreement) and a positive conversation (discussing positive aspects of the relationship).

We examined the social and physiological responses separately in this paper (vs. assuming a mechanistic model in which physiological responses predict social responses) to gain a better understanding of each possibility. Existing research suggests that different response channels are sometimes dissociable (e.g., Mauss et al., 2005). More specifically, it is possible that suppression correlates differently with physiological responses than it does with social responses. Thus, each type of response may add unique information, and our framework facilitates the consideration of these different possibilities.

1.1. Spontaneous suppression

What does existing research tell us about spontaneous suppression? One way to approach this question is to consult studies in which participants were given instructions to suppress their emotions while engaging in a laboratory task (e.g., interacting with another person). Instructed suppression (compared to control conditions) reliably predicts worse social outcomes (e.g., lower rapport) for both the person using suppression and their interaction partner (Ben-Naim et al., 2013; Butler et al., 2003; Peters and Jamieson, 2016; Shahar et al., 2019). Furthermore, instructed suppression reliably predicts greater sympathetic activation and cardiovascular responding for the person using suppression, as indicated by lower finger and ear pulse amplitude (e.g., Gross, 1998; Gross and Levenson, 1993; but see Kunzmann et al., 2005 for an exception), finger pulse transit time (Gross and Levenson, 1993; Roberts et al., 2008; but see Kunzmann et al., 2005 for an exception), skin temperature (Gross, 1998; Richards and Gross, 2000; but see Gross and Levenson, 1993 for an exception), and higher blood pressure (Richards and Gross, 2000; Butler et al., 2003). Partners of individuals using suppression have also shown greater sympathetic activation and cardiovascular responding during interactions (Ben-Naim et al., 2013; Butler et al., 2003; Peters and Jamieson, 2016; Waters et al., 2020). Although these studies have yielded important insights about suppression, the insights are likely not generalizable to *spontaneous* suppression. Being told to suppress might have different effects from spontaneously suppressing for a few reasons. For instance, being told to suppress (compared spontaneously doing so) might result in feelings of inauthenticity and require more cognitive effort, both of which could disrupt one's communication and connection with an interaction partner and elevate physiological responding.

Another way to understand spontaneous suppression might involve evaluating correlates of people's reports on their general use of suppression (i.e., habitual suppression). Habitual suppression reliably links with social costs like lower relationship quality for the individuals using suppression (Chervonsky and Hunt, 2017; Gross and John, 2003; Kardum et al., 2021; Sasaki et al., 2021; Srivastava et al., 2009; Velotti et al., 2016). This pattern of results looks similar for partners of individuals who typically use suppression (Velotti et al., 2016). Very little work has examined habitual suppression in relation to physiology; however, one study found that habitual suppression was marginally associated with greater systolic blood pressure during an anger provocation task (Memedovic et al., 2010). Studies of habitual suppression have yielded important insights, but they also might not necessarily be applicable to spontaneous suppression, because people who say they generally suppress their emotions might not necessarily do so in specific contexts (e.g., Low et al., 2017).

The most pertinent approach to understanding spontaneous suppression involves examining unprompted suppression use in specific contexts. Experience sampling and daily diary studies provide one method for better understanding spontaneous suppression, because participants can report on their suppression use during specific events. Furthermore, laboratory studies in which participants report on their uninstructed suppression use after engaging in a task are particularly informative because they offer insights into the correlates of spontaneous suppression in standardized, controlled contexts. Thus, in the following sections, we review studies that employed these two methods.

1.2. Social correlates of spontaneous suppression

Using daily-diary methodology, studies generally support the notion that spontaneous suppression is associated with social costs. For example, in daily life, when participants suppressed emotions during relationship sacrifices (e.g., missing a fun event to care for their partner), they also reported experiencing lower relationship quality (Impett et al., 2012). This pattern extended beyond the person using suppression such that partners of people using suppression reported lower relationship quality as well. Additionally, greater suppression in daily life was associated with less felt acceptance, relatedness, and relationship satisfaction for people who use suppression (Cameron and Overall, 2018); data were not collected from their romantic partners. Laboratory studies of uninstructed suppression show a similar pattern of results. When romantic couples discussed a challenging topic, women's spontaneous suppression of negative emotions was associated with lower relationship quality (though only when the women engaged in suppression consistently throughout the conversation; Dworkin et al., 2019). In a similar vein, greater spontaneous suppression during a lab conflict conversation was associated with lower conflict resolution for the person using suppression, but not the partner (Thomson et al., 2018). Finally, spontaneous suppression of negative emotions while discussing an important goal with one's romantic partner was associated with lower perceptions of support and closeness, with partner reports mirroring this pattern (Low et al., 2017). Overall, these studies provide a mostly clear picture such that spontaneous suppression appears to be associated with social costs for the person engaging in suppression; however, when it comes to the partner of the person using suppression, it is less clear whether spontaneous suppression is socially costly.

1.3. Physiological correlates of spontaneous suppression

To our knowledge, only two studies have investigated the physiological correlates of spontaneous suppression. In the first study, suppression during a stressful speech task was associated with greater sympathetic activation, as indexed by skin conductance level, skin temperature, and finger pulse amplitude (Egloff et al., 2006). There was no association with cardiac inter-beat interval, a measure of mixed parasympathetic and sympathetic activity. In the second study, spontaneous suppression while watching a negative film clip was associated with increased parasympathetic responding, as indexed by respiratory sinus arrhythmia, but only at higher levels of negative emotional experience (Gračanin et al., 2016). Overall, these studies suggest that our understanding of the physiological correlates of spontaneous suppression is limited, and the findings to date present somewhat mixed conclusions including associations with greater sympathetic activity and greater parasympathetic activity for people who use suppression. We are

unaware of studies that have examined physiological correlates in partners of those spontaneously suppressing.

1.4. Valence of emotions suppressed and valence of context

The majority of studies examining spontaneous suppression have not distinguished the valence of the suppressed emotions and have focused on negative emotional contexts (English et al., 2017). Consequently, it is not yet clear whether the social and physiological correlates of spontaneous suppression look similar or different depending on the valence of emotions suppressed (negative vs. positive) and the valence of the context (negative vs. positive). Next, we consider whether and how the social and physiological correlates of spontaneous suppression might differ depending on the valence combination (e.g., suppressing negative emotions in a negative context) for the person using suppression and their interaction partner, respectively.

How might the social correlates of spontaneous suppression differ depending on the valence of emotions suppressed and the valence of the context? One possibility is that spontaneous suppression is associated with social costs in all valence combinations due to feelings of inauthenticity on the part of the person using suppression (English and John, 2013). Another possibility is that spontaneous suppression is associated with social costs depending only on the suppressed emotions. Specifically, suppressing positive emotions may be damaging because it goes against societal norms to express positive emotions (Mauss et al., 2011). Thus, spontaneous suppression of positive emotions, regardless of emotional context, could be associated with social costs whereas spontaneous suppression of negative emotions, regardless of emotional context, could be inert or even associated with social benefits by helping to keep the emotional tone positive. Furthermore, it is possible that the social costs of spontaneous suppression depend on both the emotions suppressed and the emotional context. On the one hand, suppressing positive emotions in a positive context might dampen the potential positivity of the interaction and be associated with social costs. On the other hand, suppressing positive emotions in a negative context could support the seriousness of the interaction and be associated with social benefits (Greenaway and Kalokerinos, 2017). Finally, any of the aforementioned patterns could generalize to the interaction partner of someone using suppression, or there could be no associations for the partner (for example, because they do not detect the use of suppression). Overall, there are several plausible patterns of results for the person using suppression and their partner, and the limited research on spontaneous suppression does not provide decisive evidence for one possibility over others.

Next, how might the physiological correlates of spontaneous suppression differ depending on the valence of emotions suppressed and the valence of the context? There are two plausible patterns for the person using suppression and the partner. Similar to predictions based on authenticity for social responses, we could expect to see associations with higher physiological activation in all valence combinations. On the other hand, if spontaneous suppression is less cognitively taxing and more natural than instructed suppression, then we might expect no associations with physiological activation for any valence combination.

1.5. Present research

The present study examined the social and physiological correlates of spontaneous suppression of negative and positive emotions in both negative and positive contexts. We examined these associations in 196 romantic dating couples ($N = 392$). All couples had been in their current relationship for at least 3 months and 99 % of couples were in different-sex relationships. First, all participants completed an online entrance survey in the absence of their romantic partner, and then each couple engaged in two standardized laboratory conversations: first they discussed an area of disagreement in their relationship, then they discussed positive aspects of their relationship.

We had four preregistered research questions that we addressed with a preregistered analysis plan (https://osf.io/mg2tw). We asked: What are the social and physiological correlates of spontaneously suppressing a) negative emotions during an in-lab negative conversation, b) positive emotions during an in-lab negative conversation, c) negative emotions during an in-lab positive conversation, and d) positive emotions during an in-lab positive conversation? To address these questions, participants rated how much they spontaneously suppressed their negative and positive emotions after both the negative and the positive conversation. Additionally, they rated the quality of each conversation and how connected they felt with their partner after each conversation. To account for the intensity of emotion experience, participants also rated the intensity of their negative and positive emotional experience. Physiological responses were collected throughout the laboratory tasks.

Our approach has several strengths. First, we examined a sample of dating couples and were thus able to capture the interpersonal nature of suppression by examining responses from both partners in the couples. Second, we examined spontaneous suppression in a controlled laboratory setting. The assessment of spontaneous suppression (vs. instructed suppression) enhances the ecological validity of our findings, and the laboratory component of our study reduced recall and other response biases compared to other forms of measurement (e.g., habitual measures). Third, our research design allowed us to take a fine-grained and comprehensive approach to understanding the social and physiological correlates of spontaneous suppression. We were able to examine different types of spontaneous suppression because we included a negative conversation and a positive conversation. Fourth, we sampled across multiple measures of autonomic physiological responses including inter-beat interval, finger pulse amplitude, skin conductance level, finger pulse transit time, and skin temperature. Finally, we 1) ensured results were unique to negative and positive suppression, by including both negative and positive suppression as predictors in the same model for all significant associations, 2) addressed a key potentially confounding variable (intensity of emotional experience) and, 3) explored theoretically relevant moderators, namely habitual suppression and gender.

2. Method

We preregistered key aspects of the method including the measures, exclusion criteria, and analytic approach (https://osf.io/mg2tw).

2.1. Participants

The sample consisted of 196 dating couples ($N = 392$) from the San Francisco Bay Area that were recruited as part of a larger study focused on emotion and emotion regulation in romantic relationships.[1] All participating couples had to be in a relationship with their current romantic partner for a minimum of three months; couples' relationship length ranged from 3 months to 12 years ($M = 17$ months, $SD = 16$ months). To limit heterogeneity in age, all participants ranged in age from 18 to 25 years old ($M = 21$, $SD = 1.7$), with 52 % identifying as Asian/Asian American, 23 % as European American/Caucasian, 7 % as Latinx/Hispanic American or Latinx/Hispanic, 3 % as Middle Eastern/Middle Eastern American, <1 % as African American, and 15 % as multiple ethnicities. Participants self-reported their gender as 49 % cis male, 49 % cis female, <1 % trans male, 1 % androgynous, and < 1 % listed a different option, declined to respond, or did not respond. Finally, 85 % of participants identified as heterosexual, 1 % as homosexual, 10 %

[1] The sample largely consisted of students, because most of the participants were recruited from college-affiliated Facebook groups. Crucially, all participants were between ages 18–25 and required to have been in their current relationship for at least 3 months. This was done to increase homogeneity of relationship phases.

as bisexual, 3 % listed a different option, declined to respond, or did not respond. One of the participants that identified as bisexual was in a same-sex relationship, whereas the other participants that identified as bisexual were in different-sex relationships.

2.2. Procedures

Participants completed a one-hour online survey focused on their socio-emotional lives and demographic information. They completed the survey from a location of their choice and were instructed to refrain from discussing the survey with their partner. Once both partners completed the online survey, they completed a joint lab session. The entire lab session took approximately 2 h to complete, and each participant received $40 in cash or 2.5 course credits for completing the entire study (i.e., the survey and the lab session). If participants only completed the online survey, they were compensated with $15 via check or 0.5 course credit.

Participants first watched a neutral film clip to capture their physiological baseline and then engaged in two conversations during the two-hour lab session; the first conversation was about an area of conflict (i.e., negative conversation) in the relationship, and the second conversation was about an area of positivity (i.e., positive conversation) in the relationship. The order of the conversations was not counterbalanced so that all participants left the lab after discussing a positive topic.[2] After each conversation, participants filled out a survey including the following measures for the primary and secondary analyses: negative emotion suppression, positive emotion suppression, conversation quality, relationship quality, and intensity of emotional experiences.

2.2.1. Baseline film clip

After application of the physiological sensors (described below), participants watched a 5-min neutral film clip. The clip is part of a documentary on swallows and was chosen because it does not evoke strong negative or positive emotional responses.

2.2.2. Negative conversation

Using an approach similar to the Couple's Problem Inventory (Gottman et al., 1977), a research assistant presented participants with a sheet of relationship topics that might be an area of conflict (e.g., communication, friends). Participants rated how much each of the topics were an area of conflict within their relationship using the following rating scale: 1 – *Not a problem in our relationship OR Not applicable,* 2 – *A problem in our relationship,* 3 – *A serious problem in our relationship, or* 4 – *A problem or serious problem in our relationship; however, I do not want to discuss this topic.* The research assistant placed a barrier between the participants any time they were answering questions or preparing for the conversation. Once both participants finished rating the topics, the research assistant asked each participant to fill out a brief survey. During this time, the research assistant went into a separate room, looked at the responses, and identified the first topic of conflict that both partners marked down with the same intensity. After participants completed the brief survey, the research assistant returned and told participants the topic of their conflict conversation and asked them to take 90 s to think about what they wanted to discuss. After the 90 s, the research assistant entered the room and delivered the following instructions:

"*Okay, it looks like you both agree that [topic] is a problematic area within your relationship. In a minute, I'm going to leave the room and I'd like you to talk about [topic] for 7 minutes. We'd like each of you to tell your side and opinion and then try to work on the problem, so that maybe your two sides might get a little closer. We understand that you will probably not resolve this disagreement, but this gives you a frame for the conversation. Try to stay on topic, but if you exhaust this topic, you can move onto another topic of disagreement.*" The research assistant then left the room.

2.2.3. Positive conversation

Similar to the negative conversation, a research assistant presented participants with a sheet of relationship topics that might be an area of positivity (e.g., expressing affection, joint activities). The following procedures were the same as for the negative conversation except participants received the following instructions before the positive conversation began:

"*Okay, it looks like you both agree that [topic] is a positive moment/area within your relationship. Now I'm going to leave the room and I'd like you to talk about [topic] for 7 minutes. In the conversation, we want you to discuss how your partner makes these moments/areas so positive for you. We'd like you to share with your partner your positive feelings and really describe what you like about them. If your topic is broad, try to think about specific moments with your partner or examples that show how you feel.*"

2.3. Measures

Participants completed all self-report measures using a Likert scale ranging from 1 (*strongly disagree or not at all*) to 7 (*strongly agree or extremely*), except for emotional experience which was measured from 1 (*not at all*) to 5 (*extremely*). For each multi-item scale, we averaged across the items to create a single composite score. Descriptive statistics and internal consistencies for the self-report and physiological measures described below are shown in Table 1 and zero-order associations are shown in Tables 2 and 3.

2.3.1. Self-report measures for primary analyses

2.3.1.1. Negative suppression. Suppression of negative emotions during each in-lab conversation was measured using an item adapted from the Emotion Regulation Questionnaire (Gross and John, 2003). Participants responded to the following item after each conversation: *I made sure not to express my negative emotions.*

2.3.1.2. Positive suppression. Suppression of positive emotions during each in-lab conversation was measured using an item adapted from the Emotion Regulation Questionnaire (Gross and John, 2003). Participants responded to the following item after each conversation: *I made sure not to express my positive emotions.*

2.3.1.3. Conversation quality. Conversation quality after each in-lab conversation was measured using two items: *I am satisfied with how the conversation went. I think the conversation went well.*

2.3.1.4. Connectedness. Connectedness after each in-lab conversation was measured using two items: *How connected do you feel to your partner right now? How close do you feel to your partner right now?*

2.3.2. Physiological measures for primary analyses

During each conversation, physiological channels were sampled at 1000 Hz using MindWare laboratory software. Customized analysis software (ANSLAB; www.anslab.net; Blechert et al., 2016; Wilhelm et al., 1999) was used for physiological data reduction, artifact control, and computation of second-by-second scores for each participant. Artifacts (automatically detected by ANSLAB as out-of-range values such as inter-beat intervals of <375 msec in typical human data) and segments

[2] Because we did not counterbalance the order of the conversations, the interpretation of the associations in the positive conversation must consider potential spillover effects from the negative conversation. Although we included an unemotional task in between the two conversations, we acknowledge the possibility that the emotional experiences in the positive conversation might have been dampened by the emotional experiences in the negative conversation. As shown in Table 1, however, participants experienced significantly greater negative emotion in the negative conversation and significantly greater positive emotion in the positive conversation.

Table 1
Descriptive statistics and internal consistencies for variables in primary and control analyses.

	N	*M*	*SD**	Minimum	Maximum	α	ICC
Neg. conv. suppression of negative emotions	391	2.90_a	1.45	1.00	7.00	–	–
Pos. conv. suppression of negative emotions	390	2.63_b	1.64	1.00	7.00	–	–
Neg. conv. suppression of positive emotions	392	2.26_a	1.37	1.00	7.00	–	–
Pos. conv. suppression of positive emotions	392	2.00_b	1.42	1.00	7.00	–	–
Baseline inter-beat interval (msec)	367	772.05_a	5.24	478.43	1244.99	0.99	–
Neg. conv. inter-beat interval (msec)	367	738.92_b	5.24	498.60	1230.84	0.99	0.14
Pos. conv. inter-beat interval (msec)	366	762.57_c	5.24	498.88	1279.81	0.99	0.19
Baseline finger pulse amplitude	358	0.30_a	0.01	0	1.69	0.98	–
Neg. conv. finger pulse amplitude	358	0.17_b	0.01	0	1.23	0.98	<0.001
Pos. conv. finger pulse amplitude	355	0.19_c	0.01	0	1.43	0.99	<0.001
Baseline skin conductance level (μS)	361	8.36_a	0.24	0.13	26.24	0.99	–
Neg. conv. skin conductance level (μS)	361	10.41_b	0.24	0.24	29.56	1	0.09
Pos. conv. skin conductance level (μS)	360	9.34_c	0.24	0.25	29.04	1	0.07
Baseline finger pulse transit time (msec)	358	252.48_a	1.26	204.45	372.73	0.99	–
Neg. conv. finger pulse transit time (msec)	358	243.40_b	1.26	186.68	417.47	0.99	<0.001
Pos. conv. finger pulse transit time (msec)	355	248.07_c	1.26	193.83	421.86	0.99	<0.001
Baseline skin temperature (°F)	367	85.64_a	0.26	72.67	92.90	1	–
Neg. conv. skin temperature (°F)	367	82.16_b	0.26	71.59	92.49	1	0.19
Pos. conv. skin temperature (°F)	366	83.21_c	0.26	71.59	92.34	1	0.20
Neg. conv. quality	392	5.70_a	1.10	1.50	7.00	0.87	0.45
Pos. conv. quality	392	6.24_b	0.83	2.00	7.00	0.94	0.35
Neg. conv. connectedness	392	6.18_a	0.99	1.50	7.00	0.93	0.46
Pos. conv. connectedness	392	6.42_b	0.83	2.00	7.00	0.94	0.34
Neg. conv. negative emotions	392	1.47_a	0.47	1.00	3.90	0.84	–
Pos. conv. negative emotions	392	1.16_b	0.26	1.00	3.40	0.72	–
Neg. conv. positive emotions	392	2.74_a	0.77	1.00	5.00	0.89	–
Pos. conv. positive emotions	392	3.54_b	0.78	1.40	5.00	0.90	–
Habitual negative suppression	390	3.68	1.50	1.00	7.00	–	–
Habitual positive suppression	391	2.74	1.22	1.00	6.00	–	–

Note. Neg. conv. = Negative conversation. Pos. conv. = Positive conversation. Participants completed all self-report measures using a Likert scale ranging from 1 (*strongly disagree or not at all*) to 7 (*strongly agree or extremely*), except for emotional experience which was measured from 1 (*not at all*) to 5 (*extremely*). We calculated Cronbach's alpha for the physiological measures by separating each task into 30-s segments and examining the reliability across those segments and for each task. Alphas were adequate and the lowest item-total correlation was 0.73, suggesting that each of the 30-s segments reliably related to the rest of the segments within a task. Intraclass correlation coefficients (ICCs) are provided for the outcome variables in the analyses. To examine the differences in physiological measures by task, we used two-level multi-level models with responses nested within participants. *For the physiological measures, we report the standard error from the multi-level models (vs. the standard deviation). To examine the differences in the other measures by task, we used paired samples *t*-tests. Subscripts denote that means of the same measure across tasks (i.e., negative suppression within the negative conversation and negative suppression within the positive conversation) differ from one another at $p < .05$.

Table 2
Pearson's correlations for actor and partner variables relevant to the negative conversation.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Actor suppression of negative emotions												
2. Actor suppression of positive emotions	**0.35**											
3. Actor inter-beat interval (R)	−0.06	−0.01										
4. Actor finger pulse amplitude (R)	−0.01	0.06	−0.05									
5. Actor skin conductance level	0.07	0.04	−0.04	−0.05								
6. Actor finger pulse transit time (R)	−0.04	0.03	**0.46**	**−0.15**	0.08							
7. Actor skin temperature (R)	0.02	0.06	−0.01	**0.39**	0.05	0.09						
8. Actor conversation quality	**−0.30**	**−0.22**	−0.02	<0.001	0.07	−0.01	−0.05					
9. Actor connectedness	**−0.23**	**−0.16**	−0.02	−0.04	**0.10**	−0.02	−0.10	**0.55**				
10. Actor negative emotions	**0.22**	0.06	0.04	−0.01	**−0.13**	−0.03	0.02	**−0.51**	**−0.40**			
11. Actor habitual negative suppression	**0.18**	0.07	−0.06	**0.17**	0.03	−0.08	0.01	**0.10**	−0.05	0.04		
12. Actor habitual positive suppression	**0.15**	**0.16**	−0.04	**0.18**	0.01	−0.06	0.05	**−0.11**	**−0.12**	0.05	**0.38**	
13. Partner suppression of negative emotions	**0.20**	0.03	−0.05	0.02	−0.01	0.02	0.05	**−0.13**	−0.08	**0.11**	0.04	<0.001
14. Partner suppression of positive emotions	0.03	−0.03	−0.02	0.01	0.01	−0.05	0.01	−0.03	−0.07	0.07	−0.03	0.06
15. Partner inter-beat interval (R)	−0.05	−0.02	**0.14**	0.06	0.01	0.03	**−0.11**	<0.001	−0.06	−0.04	−0.01	0.08
16. Partner finger pulse amplitude (R)	0.02	0.01	0.06	**−0.19**	0.05	**0.15**	0.10	**−0.11**	−0.09	0.10	−0.07	**−0.13**
17. Partner skin conductance level	−0.01	0.01	0.01	0.05	0.08	0.05	0.05	0.04	0.06	−0.07	0.06	−0.01
18. Partner finger pulse transit time (R)	0.02	−0.05	0.03	**0.15**	0.05	−0.04	**−0.11**	0.06	−0.02	−0.03	**0.12**	**0.18**
19. Partner skin temperature (R)	0.05	0.01	**−0.11**	0.10	0.05	**−0.11**	**0.19**	−0.09	−0.07	0.07	0.04	0.08
20. Partner conversation quality	**−0.13**	−0.03	<0.001	**−0.11**	0.04	0.06	−0.09	**0.45**	**0.35**	**−0.29**	0.01	−0.04
21. Partner connectedness	−0.08	−0.07	−0.06	−0.09	0.06	−0.02	−0.07	**0.35**	**0.46**	**−0.25**	0.02	<0.001
22. Partner negative emotions	**0.11**	0.07	−0.04	0.10	−0.07	−0.03	0.07	**−0.29**	**−0.25**	**0.32**	−0.02	0.05
23. Partner habitual negative suppression	0.04	−0.03	−0.01	−0.07	0.06	**0.12**	0.04	0.01	0.02	−0.02	−0.01	−0.01
24. Partner habitual positive suppression	<0.001	0.06	0.08	**−0.13**	−0.01	**0.18**	0.08	−0.04	<0.001	0.05	−0.01	0.05

Note. Variables 11, 12, 23, and 24 come from the one-hour online survey. Bolded values indicate significance at the 5 % level.

with <20 % complete data were excluded using ANSLAB. Additionally, reduced physiological data from all tasks were visually inspected by trained research assistants for outliers, and these were edited based on raw data by insertion, deletion, or interpolation (see Blechert et al., 2016). After down-sampling to 4 Hz, second-by-second physiological scores were exported using the coherence module in ANSLAB. Once we

Table 3
Pearson's correlations for actor and partner variables relevant to the positive conversation.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Actor suppression of negative emotions												
2. Actor suppression of positive emotions	**0.19**											
3. Actor inter-beat interval (R)	0.10	−0.04										
4. Actor finger pulse amplitude (R)	0.05	0.10	−0.10									
5. Actor skin conductance level	−0.09	−0.10	−0.04	−0.06								
6. Actor finger pulse transit time (R)	0.02	0.01	**0.45**	**−0.27**	0.02							
7. Actor skin temperature (R)	−0.01	0.03	−0.05	**0.31**	−0.03	0.03						
8. Actor conversation quality	**−0.22**	**−0.37**	−0.01	−0.06	**0.11**	<0.001	**−0.11**					
9. Actor connectedness	**−0.23**	**−0.25**	0.07	−0.09	0.10	0.04	**−0.14**	**0.64**				
10. Actor positive emotions	**−0.21**	**−0.29**	0.04	−0.03	0.09	0.04	−0.02	**0.56**	**0.52**			
11. Actor habitual negative suppression	0.09	0.03	−0.05	**0.17**	0.06	−0.05	−0.03	0.06	−0.04	0.04		
12. Actor habitual positive suppression	**0.10**	**0.25**	−0.04	**0.22**	0.02	−0.08	0.07	**−0.17**	**−0.15**	**−0.13**	**0.38**	
13. Partner suppression of negative emotions	0.06	0.08	0.07	−0.02	−0.03	**0.12**	−0.05	**−0.13**	**−0.15**	**−0.12**	0.06	0.10
14. Partner suppression of positive emotions	0.08	0.09	0.04	−0.08	−0.04	0.05	0.06	**−0.12**	**−0.11**	**−0.11**	−0.03	−0.04
15. Partner inter-beat interval (R)	0.07	0.04	**0.19**	0.05	<0.001	0.06	**−0.14**	<0.001	<0.001	0.05	<0.001	0.09
16. Partner finger pulse amplitude (R)	−0.02	−0.08	0.05	**−0.13**	0.03	**0.11**	**0.18**	0.01	−0.03	−0.05	−0.03	−0.10
17. Partner skin conductance level	−0.03	−0.04	<0.001	0.03	0.07	0.06	0.03	**0.14**	0.07	0.09	0.08	−0.01
18. Partner finger pulse transit time (R)	**0.12**	0.05	0.06	**0.11**	0.06	−0.05	**−0.24**	−0.02	−0.03	−0.03	**0.15**	**0.19**
19. Partner skin temperature (R)	−0.05	0.06	**−0.14**	**0.18**	0.03	**−0.24**	**0.20**	−0.01	−0.06	<0.001	0.06	**0.11**
20. Partner conversation quality	**−0.13**	**−0.12**	<0.001	0.01	**0.14**	−0.02	−0.01	**0.35**	**0.30**	**0.22**	0.02	−-0.02
21. Partner connectedness	**−0.15**	**−0.11**	<0.001	−0.03	0.07	−0.03	−0.06	**0.30**	**0.34**	**0.23**	−0.03	−0.04
22. Partner negative emotions	**−0.12**	**−0.11**	0.05	−0.05	0.09	−0.03	<0.001	**0.22**	**0.23**	**0.25**	−0.04	−0.06
23. Partner habitual negative suppression	0.06	−0.03	<0.001	−0.03	0.08	**0.15**	0.06	0.02	−0.03	−0.04	−0.01	−0.01
24. Partner habitual positive suppression	0.10	−0.04	0.09	−0.10	−0.01	**0.19**	**0.11**	−0.02	−0.04	−0.06	−0.01	0.05

Note. Variables 11, 12, 23, and 24 come from the one-hour online survey. Bolded values indicate significance at the 5 % level.

exported the second-by-second data, we used the programming software R (version 4.1.1) to create an average physiological score for the baseline task, the negative conversation, and the positive conversation. Furthermore, we standardized all physiological measures and reverse-scored all physiological measures except for skin conductance level so that higher scores on all measures indicated greater physiological activation. Our preregistration includes information about examining a composite of several physiological measures used in previous research (i.e., inter-beat interval, finger pulse amplitude, skin conductance level, finger pulse transit time, and skin temperature), in addition to individual measures; however, the values of Cronbach's alpha for the physiological composites were low ($\alpha s < 0.18$). We decided against using the composite given its low reliability and given the composite measure does not provide information beyond the individual measures.

We examined inter-beat interval (IBI)(R) as a key measure of overall psychophysiological arousal (mixed sympathetic and parasympathetic), finger pulse amplitude (FPA)(R) as a key measure of sympathetic activation (predominantly adrenergic; Elgendi, 2012), and skin conductance level (SCL) as a key measure of sympathetic activation (predominantly cholinergic; Machado-Moreira et al., 2012). We collected two additional measures to provide continuity with past research: finger pulse transit time (FPTT)(R) and skin temperature (SKT)(R) which both measure sympathetic activation.

We measured the electrical signal of the heart with an electrocardiogram (ECG) using a Lead I configuration with three MindWare Disposable ECG 1–1/2″ electrodes. From this channel, we calculated the *inter-beat interval* (IBI; in msec) from the interval between successive R-waves in the ECG, which measures the time of one complete heart cycle. Values from ectopic or other kinds of abnormal beats were visually inspected and deleted or replaced by linearly interpolated values. After reverse scoring, higher values indicate faster heart rate.

Additionally, we measured the volumetric variations of blood circulation using a photoplethysmogram (PPG). A sensor was placed on the tip of the non-dominant ring finger to measure volumetric variations in blood perfusion. We calculated two measures from this channel; *finger pulse amplitude* (FPA; in arbitrary units) and *finger pulse transit time* (FPTT; in msec). FPA was measured by obtaining the difference between a maximum and adjacent minimum that represents the amplitude of PPG pulses (Webster, 1997). FPTT was calculated by the time, in milliseconds, it takes a pulse wave to travel from the heart to the finger. After reverse scoring FPA and FPTT, higher values indicate more sympathetic nervous system activation.

Skin conductance measurements were acquired using a constant-voltage device that passed 0.5 V between MindWare disposable GSC 1–1/2″ foam electrodes on palms of participants' non-dominant hand. Electrodes were on participants' skin for approximately 10–15 min before the baseline task began. From this channel, we calculated *skin conductance level* (SCL; in microSiemens), which measures skin conductance over longer periods of time (Mendes, 2009). Higher values indicate more sympathetic nervous system activation.

Skin temperature (SKT; in °F) was measured using a 19 mm stainless steel disc attached to participants' fifth digit (i.e., pinky finger). After reverse scoring, higher values indicate more sympathetic nervous system activation.

2.3.3. Measures for secondary analyses

2.3.3.1. Intensity of negative emotional experience. Intensity of negative emotional experience after each in-lab conversation was measured using ten items: sad, anxious, contemptuous, resentful, guilty, angry, lonely, distressed, embarrassed, and frustrated.

2.3.3.2. Intensity of positive emotional experience. Intensity of positive emotional experience after each in-lab conversation was measured using ten items: loving, calm, touched, enthusiastic, moved, happy, compassionate, contented, grateful, and amused.

2.3.3.3. Negative Habitual Suppression. General suppression of negative emotions was measured using an item from the Emotion Regulation Questionnaire (Gross and John, 2003). Participants responded to the following item during the online survey before the lab session: *When I am feeling negative emotions, I make sure not to express them.*

2.3.3.4. Positive habitual suppression. General suppression of positive emotions was measured using an item from the Emotion Regulation Questionnaire (Gross and John, 2003). Participants responded to the following item during the online survey before the lab session: *When I am feeling positive emotions, I make sure not to express them.*

2.4. Analysis plan

We utilized an actor-partner interdependence model framework (APIM; Kenny et al., 2006) to analyze the associations between both partners' spontaneous suppression use and the social and physiological measures. The APIM estimates two different effects referred to as actor and partner effects. The actor effect assesses the influence of a person's predictor variable on his/her own outcome variable and the partner effect assesses the influence of the partner's predictor variable on the actor's outcome variable. The APIM assumes that responses from each partner in the dyad are dependent and treats the dyad as the unit of analysis. Consequently, actor and partner effects are estimated concurrently, controlling for each other. Although most of our sample included heterosexual couples that can be distinguished on the basis of self-reported gender, individuals in same-sex couples ($n = 4$) and individuals who self-identified as non-binary ($n = 7$) participated in this study. This consideration led us to use an indistinguishable dyads approach (i.e., we did not examine gender as a moderating variable of the actor and partner effects) for our primary analyses, though we examine the possible moderating role of gender in a secondary analysis.

Additionally, for models with physiological measures as the outcome variables, we controlled for the participant's baseline physiological response. For example, when examining the association between negative suppression during the negative conversation and skin conductance level, we included the participant's average skin conductance level from the baseline task as a predictor in the model.

To control for the false discovery rate that is an issue when conducting multiple tests, we include original as well as corrected *p*-values for all analyses using the Benjamini-Hochberg method (Benjamini and Hochberg, 1995). We made family-wise corrections within each research question (4 total) and within each type of outcome (2 total). Thus, there were 8 families of analyses to address the primary research questions. Each family examining the research questions for the physiological correlates included 5[3] tests and each family examining the research questions for the social correlates included 2 tests. As preregistered, we based our inferences on the corrected *p*-values.

3. Results

We addressed four questions in our primary analyses, and the results supporting the following inferences are shown in Table 4. Predictor variables were not centered because the within-dyad actor and partner estimates sufficiently address the primary research questions, and we thus do not present or interpret the intercept of any models.

3.1. Negative emotions during a negative conversation

Spontaneously suppressing negative emotions during a negative conversation was associated with lower conversation quality ($b = -0.21$, $t(193) = -5.90$, $p_{corrected} < 0.001$) and lower connectedness ($b = -0.15$, $t(193) = -4.61$, $p_{corrected} < 0.001$) for oneself (i.e., significant actor effects) but not for one's partner (i.e., nonsignificant partner effects; $ps_{corrected} \geq 0.22$). There were no significant associations with the physiological measures ($ps_{corrected} \geq 0.38$).

3.2. Positive emotions during a negative conversation

Spontaneously suppressing positive emotions during a negative conversation was associated with lower conversation quality ($b = -0.18$, $t(194) = -4.40$, $p_{corrected} < 0.01$) and lower connectedness ($b = -0.12$, $t(194) = -3.21$, $p_{corrected} < 0.01$) for oneself (i.e., significant actor effects) but not for one's partner (i.e., nonsignificant partner effects; $ps_{corrected} \geq 0.30$). There were no significant associations with the physiological measures ($ps_{corrected} \geq 0.30$).

3.3. Negative emotions during a positive conversation

Spontaneously suppressing negative emotions during a positive conversation was associated with lower conversation quality ($b = -0.11$, $t(192) = -4.26$, $p_{corrected} < 0.001$) and lower connectedness ($b = -0.11$, $t(192) = -4.60$, $p_{corrected} < 0.001$) for oneself (i.e., significant actor effects), and lower conversation quality ($b = -0.06$, $t(192) = -2.39$, $p_{corrected} < 0.05$) and lower connectedness ($b = -0.07$, $t(192) = -2.78$, $p_{corrected} < 0.05$) for one's partner (i.e., significant partner effects). There were no significant associations with the physiological measures ($ps_{corrected} \geq 0.15$).

3.4. Positive emotions during a positive conversation

Spontaneously suppressing positive emotions during a positive conversation was associated with lower conversation quality ($b = -0.21$, $t(194) = -7.88$, $p_{corrected} < 0.001$) and lower connectedness ($b = -0.14$, $t(194) = -5.02$, $p_{corrected} < 0.001$) for oneself (i.e., significant actor effects) but not for one's partner (i.e., nonsignificant partner effects; $ps_{corrected} \geq 0.08$). There were no significant associations with the physiological measures ($ps_{corrected} \geq 0.05$).

3.5. Simultaneously accounting for both types of suppression

To ensure that findings were unique to negative and positive suppression, we reran analyses accounting for both negative and positive suppression as predictors in the same model for all significant associations in the primary analyses. Table S1 in the online Supplemental Material shows that the results were largely unchanged; however, two significant effects did become nonsignificant. Actors' positive suppression during the negative conversation was no longer associated with actors' connectedness when controlling for negative suppression during the negative conversation. Furthermore, partners' negative suppression during the positive conversation was no longer associated with actors' connectedness when controlling for positive suppression during the positive conversation.

3.6. Adjusting for intensity of emotional experience

To ensure that findings were not explained by the intensity of emotional experiences during the conversations, we reran analyses controlling for intensity of emotional experience for all significant associations in the primary analyses. As preregistered, we controlled for actor and partner intensity of negative emotional experiences in the analyses for the negative conversation, and we controlled for actor and partner intensity of positive emotional experiences in the analyses for the positive conversation. Table S2 in the online Supplemental Material shows that the results were largely unchanged. All actor effects remained significant, but the associations between partners' negative suppression during the positive conversation and actors' conversation quality and connectedness were no longer significant.

3.7. Accounting for outliers

To ensure the primary results were not driven by outliers, we reran analyses while excluding participants who scored 3 *SD* above or below the mean on the social or physiological variables for each conversation. Table S3 in the online Supplemental Material shows that the results remained largely unchanged. All significant associations from the primary analyses held and there was one new significant association;

[3] This number deviates from our preregistration because we had originally intended to use a composite for the fourth physiological measure. Given the low reliability of the composites, we examined the two additional physiological measures (finger pulse transit time and skin temperature) separately, thus increasing the number of tests to 5.

Table 4
Multi-level models of actor and partner suppression predicting social and physiological measures.

	Actor effects			Partner effects		
	Unstandardized *b* estimate	*t* (df)	*p* (corrected *p*)	Unstandardized *b* estimate	*t* (df)	*p* (corrected *p*)
Negative suppression during the *negative conversation* predicting…						
Conversation quality	**−0.21**	−5.90 (193)	< 0.001 (<0.001)	−0.06	−1.61 (193)	0.11 (0.22)
Connectedness	**−0.15**	−4.61 (193)	< 0.001 (<0.001)	−0.02	−0.66 (193)	0.51 (0.51)
Inter-beat interval (R)	−0.005	−0.30 (172)	0.77 (0.78)	−0.02	−1.53 (172)	0.13 (0.38)
Finger pulse amplitude (R)	−0.01	−0.40 (165)	0.69 (0.78)	0.02	0.97 (165)	0.33 (0.54)
Skin conductance level	0.03	1.73 (169)	0.09 (0.40)	−0.03	−1.44 (169)	0.15 (0.38)
Finger pulse transit time (R)	−0.02	−1.42 (165)	0.16 (0.40)	0.01	0.55 (165)	0.58 (0.58)
Skin temperature (R)	−0.01	−0.28 (171)	0.78 (0.78)	0.02	0.80 (171)	0.43 (0.54)
Positive suppression during the *negative conversation* predicting…						
Conversation quality	**−0.18**	−4.40 (194)	<0.001 (0.002)	−0.03	−0.74 (194)	0.46 (0.46)
Connectedness	**−0.12**	−3.21 (194)	0.002 (0.002)	−0.05	−1.45 (194)	0.15 (0.30)
Inter-beat interval (R)	0.004	0.26 (173)	0.80 (0.80)	−0.01	−0.70 (173)	0.49 (0.80)
Finger pulse amplitude (R)	0.05	1.93 (166)	0.06 (0.30)	0.04	1.35 (166)	0.18 (0.45)
Skin conductance level	0.02	0.91 (170)	0.37 (0.68)	−0.003	−0.13 (170)	0.90 (0.90)
Finger pulse transit time (R)	0.01	0.62 (166)	0.54 (0.68)	0.03	1.40 (166)	0.16 (0.45)
Skin temperature (R)	−0.01	−0.66 (172)	0.51 (0.68)	−0.01	−0.47 (172)	0.64 (0.80)
Negative suppression during the *positive conversation* predicting…						
Conversation quality	**−0.11**	−4.26 (192)	<0.001 (<0.001)	**−0.06**	−2.39 (192)	0.02 (0.02)
Connectedness	**−0.11**	−4.60 (192)	<0.001 (<0.001)	**−0.07**	−2.78 (192)	0.006 (0.01)
Inter-beat interval (R)	0.02	1.44 (170)	0.15 (0.25)	−0.01	−0.53 (170)	0.60 (0.72)
Finger pulse amplitude (R)	0.05	1.92 (161)	0.06 (0.15)	−0.02	−1.01 (161)	0.32 (0.72)
Skin conductance level	−0.04	−1.93 (167)	0.06 (0.15)	0.01	0.48 (167)	0.63 (0.72)
Finger pulse transit time (R)	0.001	0.04 (161)	0.97 (0.97)	0.02	1.47 (161)	0.14 (0.70)
Skin temperature (R)	0.02	0.77 (169)	0.44 (0.55)	−0.01	−0.36 (169)	0.72 (0.72)
Positive suppression during the *positive conversation* predicting…						
Conversation quality	**−0.21**	−7.88 (194)	<0.001 (<0.001)	−0.05	−1.79 (194)	0.08 (0.08)
Connectedness	**−0.14**	−5.02 (194)	<0.001 (<0.001)	−0.05	−1.90 (194)	0.06 (0.08)
Inter-beat interval (R)	−0.02	−1.18 (172)	0.24 (0.30)	−0.01	−0.75 (172)	0.46 (0.79)
Finger pulse amplitude (R)	0.04	1.37 (163)	0.17 (0.30)	−0.01	−0.27 (163)	0.79 (0.79)
Skin conductance level	−0.06	−2.55 (169)	0.01 (0.05)	−0.01	−0.34 (169)	0.74 (0.79)
Finger pulse transit time (R)	−0.03	−1.36 (163)	0.18 (0.30)	0.02	0.90 (163)	0.37 (0.79)
Skin temperature (R)	0.02	0.65 (171)	0.52 (0.52)	0.01	0.48 (171)	0.63 (0.79)

Note. Bolded values indicate significance at the 5 % level.

partners' suppression of positive emotions during the negative conversation was associated with actors' lower connectedness.

3.8. Moderators

As preregistered, we explored whether any of the associations between spontaneous suppression and the social and physiological correlates were moderated by habitual suppression use and gender. Table S4 in the online Supplemental Material shows that none of the associations were moderated by habitual suppression. Table S5 in the online Supplemental Material shows that only one association was moderated by gender such that female-identifying participants (and not male-identifying participants) showed a negative relationship between positive spontaneous suppression and conversation quality in the negative conversation.

Furthermore, our sample had a large subsample of Asian American participants (n = 205). Because previous research suggests that the negative correlates of suppression might be less severe or even nonexistent for Asian Americans (for a review, see Tsai and Lu, 2018), we reran the primary analyses with this subsample. This was not a preregistered analysis. Overall, as shown in Table S6 of the online Supplemental Material, the results looked largely similar. The only difference was that actors' negative suppression during the positive conversation was no longer significantly associated with actors' conversation quality or connectedness.

3.9. Additional measures of relationship quality

Additionally, after each conversation, we measured three other social variables. For our main analyses, we focused on conversation quality and connectedness, because we believed these were most relevant for suppression. As preregistered, we explored the association between spontaneous suppression and three other self-reported social variables measured after each conversation – relationship satisfaction, love and commitment. Table S7 in the online Supplemental Material shows that the pattern of results for the other three social variables was consistent with the pattern of results for conversation quality and connectedness. The only exception was that partners' positive suppression during the positive conversation was associated with actors' lower relationship satisfaction, and this was not the case for conversation quality or connectedness.

3.10. Probing null effects for physiological responding

Because of the numerous null partner effects for the social correlates and the numerous null actor and partner effects for the physiological correlates, we decided to utilize a Bayesian approach to quantify evidence for the null. Specifically, we used the "brms" package (version 1.10.2) within the statistical computing platform "R" (version 4.1.1) to fit Bayesian multilevel models (Bürkner, 2017). This was not a preregistered analysis. In our analysis, posterior distributions were estimated using Markov Chain Monte Carlo (MCMC) analyses with uninformative priors, which are the *brms* default (see e.g., Kaplan, 2014). We did not specify prior distributions because there were no clear findings in the literature to inform our beliefs about the distributions of the model parameters. We used 95 % credible intervals to summarize the posterior distributions of our parameters, which are interpreted as a 95 % probability that the population value falls between the upper and lower limit, given the model (e.g., priors) and the data. To quantify evidence supporting the absence of partner effects for the social correlates, we calculated Bayes factors comparing models with just the actor spontaneous suppression predictor to models with both the actor and partner spontaneous suppression predictors. In these cases, Bayes factors >1 indicate evidence in favor of the model with just the actor spontaneous

suppression predictor; higher Bayes factors indicate greater evidence in favor of that model. To quantify evidence supporting the absence of actor and partner effects for the physiological correlates, we calculated Bayes factors comparing models with just the baseline physiological predictor to models with the baseline physiological predictor and the actor and partner spontaneous suppression predictors. In these cases, Bayes factors >1 indicate evidence in favor of the model with just the baseline physiological predictor; higher Bayes factors indicate greater evidence in favor of that model. The results shown in Table S8 in the online Supplemental Material provide consistent evidence in favor of models with just the actor spontaneous suppression predictor (vs. both the actor and partner spontaneous suppression predictors) for the social correlates and models with just the baseline physiological predictor (vs. the baseline physiological predictor and the actor and partner spontaneous suppression predictors) for the physiological correlates.

Finally, because the physiological correlates of spontaneous suppression may only appear at times of heightened levels of physiological activation during the conversation (versus the entire conversation), one could argue that our approach of averaging over the entire task hindered the examination of that possibility. To address this concern, we conducted a separate set of analyses that we did not preregister. Instead of taking the average across the entire task, we split the 420-s task into fourteen 30-s segments, averaged within each 30-s segment, selected the 30-s segment that showed the greatest (maximal) responses for each participant individually, and used this maximum segment as the basis for analyses. We used 30-s averages because this allows for sufficient reliability in psychophysiological data (versus shorter segments) while still providing sufficient temporal resolution. This new approach examined whether the 30-s segment with the maximum physiological activation related to the use of spontaneous suppression. As shown in Table S9 of the Supplemental Material, the inferences were comparable across the two approaches, indicating that spontaneous suppression was not associated with the most physiologically activating 30-s of the conversations. These additional analyses add confidence in the conclusion that spontaneous suppression was not accompanied by elevated physiological responses in these particular contexts.

4. Discussion

The present work examined the social and physiological correlates of spontaneously suppressing negative and positive emotions in negative and positive contexts. Specifically, we examined how romantic partners' self-reported spontaneous suppression of negative and positive emotions in two standardized laboratory conversations (i.e., a negative and a positive conversation) related to social (i.e., conversation quality and connectedness) and physiological measures (i.e., IBI, FPA, SCL, FPTT, and SKT). Additionally, we 1) ensured effects were unique to negative and positive suppression, 2) accounted for intensity of emotional experience, and 3) explored the potential moderating effects of habitual suppression and gender.

Spontaneous suppression was consistently associated with lower conversation quality and lower connectedness for the person using suppression but largely not for their partner, regardless of the valence of the emotion being suppressed and the context. Similar results were observed for other social correlates including relationship satisfaction, love, and commitment. Spontaneous suppression was not associated with physiological activation for the person using suppression or their partner, regardless of the valence of the emotion being suppressed and the context. The same pattern of results emerged when examining the unique effects of negative and positive suppression (i.e., when both types of suppression were entered as predictors in the same model) and when accounting for intensity of emotional experience. Finally, habitual suppression and gender did not consistently moderate the associations, suggesting that these results apply regardless of people's tendency to use suppression and to male-identifying participants and female-identifying participants equally. Ultimately, these results inform our understanding of couples' emotional communication when engaging in negatively-valenced and positively-valenced interactions.

The null results for the physiological measures were particularly interesting given previous work on instructed suppression. Several pieces of evidence suggest that the null results are not due to Type II error. Specifically, the null effects were consistent across measures and across contexts, appear in uncorrected analyses, and are supported by secondary analyses of high-activation segments. The most critical piece of evidence though were the Bayes factors which provided consistent evidence in favor of models with just the baseline physiological predictor (vs. the baseline physiological predictor and the actor and partner spontaneous suppression predictors) for the physiological correlates.

Given the correlational nature of this work, it is important to consider all possible interpretations of the findings. The pattern of results is consistent with four interpretations: 1) spontaneous suppression leads to lower-quality interactions for the person using suppression, 2) lower-quality interactions lead to spontaneous suppression, 3) the association between spontaneous suppression and lower-quality interactions is bidirectional, and 4) spontaneous suppression and lower-quality interactions are linked by a third variable. First, it is possible that spontaneous suppression leads to lower-quality interactions for the person using suppression due to feelings of inauthenticity (English and John, 2013). Specifically, if an individual suppresses their emotions, they might feel like they are not being true to themselves and thus feel negatively about how the conversation went. Second, it is possible that lower-quality interactions lead to spontaneous suppression due to high negative emotional experience. Specifically, if an interaction is going poorly, then an individual might feel more negative emotions and thus engage in spontaneous suppression to hide those feelings. The results adjusting for intensity of emotional experience speak to this option and suggest that this direction is less plausible, because the pattern was consistent when accounting for emotional intensity. Third, it is possible that both of the directions outlined above happen simultaneously such that spontaneous suppression leads to lower-quality interactions and lower-quality interactions lead to more suppression. Finally, it is possible that spontaneous suppression and lower-quality interactions are explained by a third variable. We ruled out one third variable (i.e., intensity of emotional experience); however, this interpretation cannot be ruled out entirely (e.g., personality).

4.1. Self vs. partner effects

Arguably one of the most defining features of suppression is that it may come with costs for not only the person using suppression but people who interact with them. Specifically, prior research on instructed suppression has reliably demonstrated worse outcomes like lower rapport (e.g., Butler et al., 2003) and greater sympathetic activation and cardiovascular responding (e.g., Ben-Naim et al., 2013; Butler et al., 2003; Peters and Jamieson, 2016; Waters et al., 2020) for both the person using suppression and their interaction partner. Studies on spontaneous suppression tell a slightly different story, such that spontaneous suppression is consistently associated with social costs for the person using suppression, but inconsistently associated with social costs for the partner of the person using suppression (e.g., Impett et al., 2012; Thomson et al., 2018). Our results converge with this latter set of findings such that spontaneous suppression was associated with lower conversation quality and connectedness for the person using suppression, but not their partner, in most analyses.

For one, these findings suggest that spontaneous suppression is linked with perceived social costs for the self, which is possibly due to feelings of inauthenticity. If an individual is holding back their emotions during an interaction, they will likely also feel less connected to the person they are interacting with. Interestingly, these findings also suggest that spontaneous suppression might not be as disruptive for the interaction partner, perhaps because the person using suppression is engaging in suppression on their own terms versus following

instructions that may cause unusual behavior and make the interaction partner uncomfortable. Thus, it might be necessary for the interaction partner to detect the use of suppression for the costs of suppression to reach the partner. In other words, if the interaction partner is unaware that the other person is using suppression, then perhaps the costs stay within the person using suppression.

4.2. Spontaneous vs. instructed suppression

The findings from the current study exhibit similarities and differences from prior work on instructed suppression in important ways. One pattern of results that is consistent with research on instructed suppression is that spontaneous suppression was associated with lower conversation quality and connectedness as reported by the person using suppression. The consistency of these patterns provides some confidence in the interpretation that even spontaneous suppression may lead to social costs.

However, the current study found that spontaneous suppression during conversations with a romantic partner was not associated with physiological activation in either the person using suppression or their partner, including when examining each person's most physiologically activated 30-s segment. This deviates from work on instructed suppression which reliably finds greater sympathetic activation and cardiovascular responding for the person using suppression and their partner (e.g., Ben-Naim et al., 2013; Butler et al., 2003; Peters and Jamieson, 2016; Waters et al., 2020). It is possible that spontaneous suppression was not physiologically activating because participants naturally chose to engage in the strategy and thus were not exerting effort to follow instructions during a task. Only one study we are aware of examined spontaneous suppression and sympathetic activation and found that suppression during a stressful speech task was associated with greater sympathetic activation (Egloff et al., 2006). Their findings are in line with instructed suppression, and this might be because the participants were completing a stressful task which is highly physiologically activating. Thus, it is possible that spontaneous suppression is linked with physiological activation during highly stressful tasks but not when having a negative or positive conversation with one's romantic partner. That said, a significant relationship between spontaneous suppression and physiological responses might emerge in this dyadic context when assessing suppression continuously during an emotional task using a rating dial (vs. assessing at one time point after the emotional task).

Additionally, the divergent associations shown for the social and physiological responses suggest that the two types of responses are dissociable, at least in the contexts presented here. That is, the way in which someone responds physiologically in an interaction is not necessarily related to the social aspects of the conversation (i.e., closeness to the interaction partner). In fact, the social and physiological measures were mostly uncorrelated in both the negative and the positive conversation, which does not support a mechanistic model between the two responses. In other words, in this study, physiological responses were not associated with social responses. Consequently, examining the associations between spontaneous suppression and different response channels can help us better understand the nuances of this emotion-regulation strategy.

4.3. Valence of emotions suppressed and valence of context

Typically, studies on spontaneous suppression and social and physiological correlates have not distinguished the valence of the suppressed emotions. To our knowledge, only one study has examined both spontaneous negative suppression and spontaneous positive suppression in relation to social correlates (Dworkin et al., 2019) and they found no direct links between either type of suppression and relationship satisfaction. Importantly, they measured suppression by comparing participants' behavior to independent coders' ratings of the participants' behavior and the current study utilized self-reports of spontaneous suppression. Thus, the current study offers novel insights into the measurement of self-reported spontaneous suppression. Specifically, negative and positive suppression were moderately correlated (r's = 0.35 in the negative conversation and 0.19 in the positive conversation), supporting the idea that suppressing negative emotions is distinct from suppressing positive emotions. Furthermore, the valence of the emotions suppressed did not shape the social and physiological correlates of spontaneous suppression in that the pattern was similar for negative or positive suppression. Other studies on spontaneous suppression suggest that the valence of emotions suppressed does matter; for example, participants reported more negative emotional experiences when spontaneously suppressing positive (vs. negative) emotions (Blalock et al., 2016). It is possible that the valence of the suppressed emotions matters more for emotional experience than for social functioning.

Most studies on spontaneous suppression and social and physiological correlates have focused on negative emotional contexts, leaving positive emotional contexts largely unexplored. Interestingly, suppression was negatively associated with social correlates regardless of the valence of the emotional context, which is in line with the idea that the emotional context does not significantly shape the social and physiological correlates of spontaneous suppression. It is possible that suppressing any type of emotion in any type of context feels inauthentic to or is effortful for the person using suppression and is thus linked with negative correlates for the self.

4.4. Limitations and future directions

While the current approach had strengths, several limitations and directions for future research are noteworthy. First, participants self-reported their use of spontaneous suppression as well as their conversation quality and connectedness. Self-reports are psychologically meaningful, but they are subject to biases. Thus, future work might obtain observer codes of spontaneous suppression and social measures to see if the current results hold with non-self-report measures.

Second, we examined whether and how the correlates of spontaneous suppression depended on the valence of the emotions suppressed (negative vs. positive) rather than by specific discrete emotions (e.g., anger vs. amusement). Although the approach to separately examine negative and positive emotions was a novel and important first step into better understanding spontaneous suppression, an even more nuanced approach might look at spontaneous suppression of several discrete emotions to examine whether the correlates differ.

Third, we examined multiple physiological channels (inter-beat interval, finger pulse amplitude, skin conductance level, finger pulse transit time, and skin temperature). This approach allowed us to broadly capture physiological responses, including sympathetic activation, but not parasympathetic activation. Links with parasympathetic activation (e.g., respiratory sinus arrhythmia) could play a role in spontaneous suppression. For example, one study suggests that the use of spontaneous suppression while watching a negative film clip was associated with increased parasympathetic responding, but only at high levels of negative emotional experience (Gračanin et al., 2016). This study did not examine spontaneous suppression and parasympathetic responding in a social context though, so there are still many unanswered questions about links between spontaneous suppression and parasympathetic activation.

Fourth, some features of our sample limit the generalizability of the current results. For one, couples had been together for an average of 17 months. Some evidence suggests that suppression might not be associated with relationship satisfaction in couples who have been married for several years and thus future work should examine whether this pattern of results holds in longer-term couples (Mazzuca et al., 2019). In addition, the majority of our sample consisted of heterosexual couples which limits the generalizability of our results to other types of relationships.

Finally, it is possible that some of the associations observed in the

current study depend on individual differences such as personality or psychopathology. Future research might examine whether and how these individual differences influence the associations between suppression, physiology, and social functioning in the context of dyadic interactions.

5. Conclusion

This research suggests that spontaneous suppression during negative and positive conversations with a romantic partner is associated with social but not physiological costs for the self but not the partner, regardless of the valence of emotions suppressed or the valence of the emotional context. Overall, these findings advance our understanding of emotion suppression and of couples' emotional communication in negatively-valenced and positively-valenced discussions.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijpsycho.2022.06.001.

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