A CROSS-CULTURAL INVESTIGATION OF CO-RUMINATION VIA CELLPHONE AMONG EMERGING ADULTS

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Introduction: This study investigated cellphone-mediated co-rumination and its association with emerging adults' anxiety, depression, and social functioning. Comparisons on the basis of gender and nation of residence (United States vs. Italy) were made, and the co-rumination subcomponent of co-brooding was explored. **Method:** Participants included 216 undergraduate students recruited in the southeastern United States and 375 students recruited in southern Italy. **Results:** Co-rumination via cellphone was associated with higher levels of anxiety and depression and lower levels of social self-efficacy in the U.S. sample. Analyses of the co-brooding element of co-rumination via cellphone revealed its robust association with anxiety and depression in the U.S. sample. In contrast, among Italian emerging adults co-rumination via cellphone was not associated with anxiety or depression and it was positively associated with social well-being. Co-brooding via cellphone was not associated with anxiety or depression in the Italy sample. **Discussion:** Cross-cultural and gender differences in co-rumination via cellphone and psychosocial functioning are discussed.

Keywords: cellphone, co-rumination, co-brooding, anxiety, depression

INTRODUCTION

Co-rumination is the tendency to extensively discuss and dwell on problems and negative feelings in interactions with others (Rose, 2002). Co-ruminative communication often involves self-disclosure, repetitive speculation about the causes of stressful situations, and an emphasis on problem- and emotion-focused talk, in contrast to attempts at problem-solving (Calmes & Roberts, 2008).

Research on co-rumination in adolescence and emerging adulthood shows that it may carry psychological risks as well as social benefits. A recent meta-analysis found that co-rumination has been consistently associated with depression, anxiety, and internalizing symptoms, with small to medium average effect sizes (Spendelow, Simonds, & Avery, 2017). Co-rumination also has been associated with positive aspects of social functioning such as friendship quality and closeness (Rose, 2002; Smith & Rose, 2011), friendship satisfaction (Calmes & Roberts, 2008), and perceived social support (Ames-Sikora, Donohue, & Tully, 2017). Rates of co-rumination tend to be higher among women when compared to men (Spendelow et al., 2017).

As noted in a recent meta-analysis of the co-rumination literature by Spendelow and colleagues (2017), most research has examined face-to-face co-ruminative interactions between same-sex best friends in the United States. This is limiting in that many of emerging adults' social interactions do not involve physical proximity, as they occur via mobile technology (Smith & Rose, 2011). Also, emerging adults endorse having close relationships with family members, romantic partners, and friends (Berscheid, Snyder, & Omoto, 1989), and thus may engage in co-ruminative interactions with a variety of people in their lives. Finally, given that most investigations of co-rumination have occurred in the United States, the generalizability of these findings to other populations of emerging adults is not clear. Further research is needed to explore how co-ruminative tendencies may vary in sociocultural contexts outside of the United States. In order to address these limitations of the co-rumination literature, the current study investigates emerging adults' co-rumination in person and in cellphone-mediated interactions, with self-identified co-rumination partners, in Italy as well as the United States.

CO-RUMINATION VIA CELLPHONE

Emerging adulthood is the only age group in the United States with 100% saturation of cellphone ownership, and 94% of this group owns a smartphone (Pew Research Center, 2018). Cellphone use is ubiquitous in this age range, and text messaging is the most commonly used cellphone feature (Smith & Page, 2015). College students in the United States report using their cell phones for as many as 8–10 hours per day, with more than 90 minutes per day spent texting (Junco & Cotten, 2012; Roberts, Yaya, & Manolis, 2014). Cellphone dependence has risen steadily in the United States in recent years and its prevalence among emerging adults has remained higher than any other age group (Pew Research Center, 2018).

Lopez-Fernandez et al. (2017) recently conducted a cross-cultural study comparing patterns of cellphone use among emerging adults in four regions in Europe. The highest rate of smartphone ownership in Europe, 96%, was found in the Southern region, which included Italy and Spain. In this region 80% of emerging adults endorsed using their cellphones every day for an average of 4 hours per day. In contrast to the Northern region, in which cellphones were used largely for solitary and instrumental purposes (i.e., reading, information-seeking, gaming), emerging adults in Southern Europe tended to use their cellphones for interpersonal purposes (i.e., texting, online chatting, and social networking).

Given this centrality of cellphone use in emerging adults' social lives, it is surprising that only two previous studies have examined technology-mediated co-rumination, both conducted in the United States. In an initial exploration of cellphones as vehicles for co-ruminative interactions, Murdock, Gorman, and Robbins (2015) found that co-rumination via cellphone, but not face-to-face co-rumination, moderated the association of perceived interpersonal stress with positive mental health. That is, higher levels of interpersonal stress were significantly associated with poorer mental health only among college students who endorsed higher levels of co-rumination via cellphone. Interpersonal stress was positively associated with social burnout (i.e., feelings of cynicism, decreased self-efficacy, and/or emotional exhaustion regarding social relationships) only at higher levels

of co-rumination via cellphone as well, at a marginally statistically significant level. These effects were found even after partialling out the variance in the outcomes accounted for by students' overall cellphone use. In this study, undergraduate women endorsed significantly higher levels of both co-rumination via cellphone and face-to-face co-rumination when compared to undergraduate men, and the two modalities of co-rumination were moderately positively correlated among women, but not among men.

In a second study of technology-mediated co-rumination, researchers examined co-rumination among college students and adults across four modalities of communication: in-person, talking on the phone, texting, and via social network sites (Keshishian, Watkins, & Otto, 2016). In-person co-rumination was significantly and positively correlated with co-rumination via phone calls, texting, and social networking. Among college students in this sample, co-rumination via phone conversations and texting was positively associated with positive friendship quality, but not with anxiety or depression. In-person co-rumination was significantly and positively associated with friendship quality and anxiety, but not significantly related to depression.

Taken together, these initial studies suggest that cellphones are used as vehicles for co-rumination. Furthermore, co-rumination via cellphone and face-to-face co-rumination appear to be overlapping but independent constructs, with different patterns of psychosocial correlates.

SOCIOCULTURAL CONTEXTS OF CO-RUMINATION AND WELL-BEING

Gender is the primary sociocultural factor to receive attention in the co-rumination literature, with studies routinely finding higher rates of co-rumination among girls and young women when compared to boys and young men (Spendelow et al., 2017; Tompkins, Hockett, Abraibesh, & Witt, 2011). It is possible that these gender differences emerge because girls and women initiate more co-ruminative interactions than males, because they are more likely than males to be invited into others' co-ruminative processes, or both. In fact, Barstead, Bouchard, and Shih (2013) found that both male and female undergraduates were more

likely to choose a female, rather than male, closest confidant with whom to co-ruminate. This suggests that young women were likely to experience co-rumination more frequently than men regardless of whether they initiated it. Gender-specific psychosocial implications of co-rumination have received initial research attention as well. Rose, Carlson, and Waller (2007) concluded that co-rumination is associated with more problematic psychosocial sequelae for girls when compared to boys. Calmes and Roberts (2008) examined co-rumination as a mediator of the association between gender and psychosocial functioning in undergraduate students. They found that co-rumination with a close friend (but not with a parent, roommate, or romantic partner) mediated the association of female gender with higher levels of depression and friendship quality. That is, young women endorsed higher levels of co-rumination with a close friend than did young men, and this was associated with psychosocial losses as well as gains for women.

Only a few studies have investigated co-rumination in cultural contexts outside of the United States, including Canada (Dirghangi et al., 2015) and northern Europe (Bastin, Mezulis, Ahles, Raes, & Bijttebier, 2015; Bastin, Vanhalst, Raes, & Bijttebier, 2018; Dam, Roelofs, & Muris, 2014; Van Zalk & Tillfors, 2017). All of these studies were conducted with adolescents. Two studies of emerging adults' co-rumination have been conducted in Italy. In each study, a positive association of face-to-face co-rumination with depression (Balsamo, Carlucci, Sergi, Murdock, & Saggino, 2015) or anxiety (Carlucci, D'Ambrosio, Innamorati, Saggino, & Balsamo, 2018) was found to be mediated by maladaptive cognitive schemas. To date, no cross-cultural studies of co-rumination appear to have been conducted.

CO-BROODING AS A MALADAPTIVE DIMENSION OF CO-RUMINATION

Research on co-rumination has recently expanded to address nuances in the dyadic processing of problems and negative feelings. Following the literature on depressive rumination (Treynor, Gonzalez, & Nolen-Hoeksema, 2003), Bastin and colleagues (2014) introduced the constructs of co-brooding (characterized as a passive tendency to dwell on and catastrophize problems

in dyadic interactions) and co-reflecting (a more activated tendency to explore causal analyses of a problem in an effort to gain insight about it). Although co-reflecting has not been associated with compromises in psychosocial functioning, co-brooding has been positively associated with symptoms of depression in adolescents both cross-sectionally and longitudinally (Bastin et al., 2014; Bastin et al., 2018). Importantly, there is some evidence that these associations are statistically significant for girls but not boys (Bastin et al., 2018), suggesting the importance of investigating maladaptive co-rumination dimensions in research designs that take gender into account.

THE CURRENT STUDY

The current study investigated co-rumination via cellphone in two samples of emerging adults: college students at a small liberal arts university in the southeastern United States and a large public university in southeastern Italy. Undergraduate students between the ages of 18 and 25 years were included in the study. Gender and cross-cultural differences in rates and patterns of co-rumination via cellphone were examined, as well as its associations with anxiety and depression. As a pilot exploration of new social correlates of co-rumination, two indicators were assessed: social self-efficacy was measured in the U.S. sample and social well-being was measured in the Italy sample. Finally, gender- and culture-specific patterns were investigated in the associations of one aspect of co-ruminative communication, co-brooding via cellphone, with anxiety and depression.

Previous research suggests that compared to men, women endorse higher levels of co-rumination (Balsamo, Carlucci, et al., 2015; Spendelow et al., 2017) and are more likely to be recruited into others' co-ruminative processes (Barstead et al., 2013). Thus, Hypothesis 1a was that female emerging adults would report significantly higher levels of co-rumination when compared to their male peers. Hypothesis 1b was that all participants would endorse co-ruminating with at least one female partner at a significantly higher rate than they would endorse co-ruminating with at least one male partner.

Just as rumination and co-rumination have been found to be overlapping but distinct constructs (Calmes & Roberts, 2008),

there is preliminary evidence that face-to-face co-rumination and technology-mediated co-rumination are separate but related tendencies (Keshishian et al., 2016; Murdock et al., 2015). Thus, Hypothesis 2a was that co-rumination via cellphone and face-to-face co-rumination would be moderately correlated with one another. Hypothesis 2b was that co-rumination via cellphone and face-to-face co-rumination would be positively associated with anxiety and depression. Drawing from the results of Murdock and colleagues (2015), it was expected that co-rumination via cellphone would be more robustly associated with outcomes than would face-to-face co-rumination.

In order to explore possible social benefits of co-rumination beyond the friendship-focused (Calmes & Roberts, 2008) and social support constructs (Ames-Sikora et al., 2017) that have been examined in the research literature thus far, the current study assessed social self-efficacy in the United States sample and social well-being in the Italy sample. Social self-efficacy refers to a person's perceived skill and confidence in social situations, and low levels have been associated with negative social expectancies, maladaptive social behaviors, and compromises in subjective well-being (Grieve, Witteveen, Tolan, & Jacobson, 2014). Social well-being refers to a person's perceived quality of relationships with other people, their community, and society (Keyes, 1998), and it has been identified as one of three basic constructs underlying overall psychosocial well-being (along with hedonic and eudemonic well-being; Gallagher, Lopez, & Preacher, 2009). Hypothesis 2c was that co-rumination via cellphone and face-to-face co-rumination would be positively associated with each of these indicators of positive social functioning.

Previous research suggests that in contrast to the co-reflection component of co-rumination, co-brooding is a particularly maladaptive aspect of co-rumination (Bastin et al., 2018). Co-brooding is endorsed at higher levels by adolescent girls compared to boys, and it is concurrently and prospectively associated with symptoms of depression for girls (Bastin et al., 2018). Thus, the current study examined a moderational model incorporating gender and co-brooding (but not co-reflection). Hypothesis 3a was that emerging adult women in the United States and in Italy would report higher levels of co-brooding via cellphone than men. Hypothesis 3b was that co-brooding via cellphone would be positively associated with anxiety and depression, and this

relationship would moderated by gender. It was expected that the strength of this relationship would be attenuated for men compared to women.

METHOD

PARTICIPANTS AND PROCEDURE

United States (U.S.) Sample. The original U.S. sample included 218 undergraduate students (69% self-identified women) enrolled at a small, residential, liberal arts university in a small town in the southeastern U.S. Two participants were excluded from data analyses because their ages fell outside of the 18–25 year age range. The age range of the final sample of 216 was 18–22 years, with a mean age of 19.8 years ($SD = 1.2$). The self-identified ethnicity and race of the sample was 6% Hispanic; 85% White; 2% Black or African American; 2% American Indian or Alaska Native; 9% Asian; 1% Native Hawaiian or Other Pacific Islander; and 2% other/unreported. Participants were recruited via posted fliers, email notices, word of mouth, and sign-up sheets in classes. Participants completed an online survey at their convenience and were eligible to enter a lottery for three $50 amazon gift cards and/or to earn extra credit. The study was approved by the Washington and Lee University Institutional Review Board and data were collected during the spring of 2016.

Since few cases with missing data (close to 5%) were detected solely in the U.S. sample and they seem to represent a random subsample of the whole sample, a listwise deletion strategy was applied for performing the analyses (Tabachnick & Fidell, 2013).

Italy Sample. The original Italy sample included 463 undergraduate students recruited from a large, urban, research university in the Abruzzo region of southeastern Italy. Participant age in the original sample ranged from 14–44 years. Eighty-eight participants were excluded whose ages fell outside of the 18–25 year age range or who did not report their age. This brought the final sample size to 375 (44% self-identified women) with a mean age of 21.5 years ($SD = 2.0$). Ethnicity/race data were not collected in this sample. Participants were recruited from undergraduate psychology courses and completed a paper and pencil survey. They participated voluntarily and anonymously, and no honorarium was given for completing the survey. The Ethics Com-

mittee of the Department of Psychological Sciences, Health and Territory, University of Chieti-Pescara, Italy approved the study and data were collected during the spring of 2016.

MEASURES

Estimated Number of Daily Cellphone Minutes. Participants were asked to estimate the number of minutes spent using their cellphone for all purposes on an average day. This was utilized as a control variable in hypothesis-testing.

Co-Rumination Via Cellphone and Face-to-Face Co-Rumination. A modified version of the 27-item Co-Rumination Questionnaire in English (CRQ; Rose, 2002) and Italian (Balsamo, Carlucci, Sergi, & Saggino, 2016) was utilized to assess participant's tendency to excessively discuss problems within close relationships. In this study, participants were asked to report co-rumination in face-to-face interactions (as in the original CRQ) and in cellphone-mediated interactions, using the following instructions: "These questions are about ways you communicate with your friends. Think about the way you usually are with your best or closest friend/s. For each item, first respond regarding your typical face-to-face interactions. Next, respond regarding your typical interactions using your cellphone or smartphone. Please think about all of the functions that you use on your phone, such as texting, calling, and using social media sites." Items were nonspecific with regard to whose problem was being discussed in the interaction (e.g., "When we communicate about a problem that one of us has . . . we try to figure out everything about the problem, even if there are parts that we may never understand"). Participants responded on a 5-point Likert scale ranging from not at all true to really true. Total scores for face-to-face co-rumination and co-rumination via cellphone were created by summing each subset of 27 items, with higher scores reflecting higher levels of each type of co-rumination. Internal consistencies were excellent for co-rumination via cellphone and face-to-face co-rumination, respectively, in the U.S. ($\alpha = .96$; $\alpha = .95$) and Italy ($\alpha = .94$; $\alpha = .93$) samples.

Immediately after completing the CRQ, participants were asked to identify the gender of up to two interaction partners they had in mind as they responded to the CRQ items. For pur-

poses of hypothesis testing, these responses were coded into two dichotomous variables reflecting whether at least one female co-rumination partner had been endorsed, and whether at least one male partner had been endorsed.

Co-Brooding Via Cellphone. A co-brooding subscale of the CRQ (Bastin et al., 2014) was used to measure participants' specific tendency toward passive and judgmental communication about negative moods and problems in their cellphone interactions (e.g., "When we communicate about a problem that one of us has, we try to figure out every one of the bad things that might happen because of the problem"). Six items from the cellphone-mediated co-rumination version of the CRQ were summed, with higher scores reflecting higher levels of co-brooding via cellphone. Internal consistencies were good for co-brooding via cellphone in the U.S. ($\alpha = .92$) and Italy ($\alpha = .89$) samples.

Anxiety. The trait version of the 21-item State-Trait Inventory for Cognitive and Somatic Anxiety in English (STICSA; Ree, French, MacLeod, & Locke, 2008) and Italian (Balsamo, Carlucci, Sergi, Romanelli et al., 2016) was utilized to evaluate cognitive and somatic symptoms of anxiety (e.g., "I feel agonized over my problems" and "My breathing is fast and shallow"). The STICSA was developed to address psychometric limitations of existing measures of anxiety, especially their extensive overlap with depression (Balsamo, Cataldi, Carlucci, & Fairfield, 2018; Balsamo, Innamorati, Van Dam, Carlucci, & Saggino, 2015; Carlucci, D'Ambrosio et al., 2018; Carlucci, Watkins et al., 2018). Participants responded on a 4-point Likert scale ranging from almost never to almost always. A total score of anxiety was created by summing items, with higher scores reflecting higher levels of anxiety. Internal consistencies were excellent in the U.S. ($\alpha = .91$) and Italy ($\alpha = .91$) samples.

Depression. The 21-item Teate Depression Inventory (TDI; Balsamo, 2013; Balsamo, Giampaglia, & Saggino, 2014; Balsamo & Saggino, 2013, 2014) was utilized to assess symptoms of major depression during the past two weeks (e.g., It seems like I have lost interest in everything I do). Participants responded on a 5-point Likert scale ranging from never to always. Total scores were created by first reverse-coding several items (e.g., I felt as though I had enough energy to perform my daily activities), and then summing items. Higher TDI scores reflect higher levels of depres-

sion. The TDI has demonstrated strong psychometric properties in both clinical and nonclinical Italian samples (Balsamo, Carlucci, Sergi, Murdock, & Saggino, 2015; Balsamo, Cataldi, Carlucci, & Fairfield, 2018; Balsamo, Cataldi, Carlucci, Padulo, & Fairfield, 2018; Balsamo, Imperatori et al., 2013; Balsamo, Innamorati, Van Dam, Carlucci, & Saggino, 2015; Balsamo, Lauriola, & Saggino, 2013; Balsamo, Macchia et al., 2015; Balsamo, Romanelli et al., 2013; Contardi, Imperatori, Amati, Balsamo, & Innamorati, 2018; Innamorati et al., 2013; Saggino et al., 2018; Saggino et al., 2017). It was translated into English using back translation procedures (see Ruan et al., 2019). Internal consistencies were excellent in the U.S. (α = .93) and Italy (α = .91) samples.

Social Self-Efficacy (U.S. Sample Only). The 18-item Social Self-Efficacy Scale (Grieve et al., 2014) was utilized to assess participants' confidence in cognitive and behavioral aspects of social interaction. This instrument measures perceived ability to predict and understand social situations (e.g., know how my actions will make others feel) as well as perceived skill in social behaviors and situations (e.g., feel comfortable around new people who I don't know). Participants responded on a 5-point Likert scale ranging from not at all confident to very confident. A total score was created by summing items, with higher scores reflecting higher perceived social self-efficacy. The Social Self-Efficacy Scale has demonstrated strong psychometric properties (Grieve et al., 2014), and internal consistency in the current U.S. sample was very good (α = .90).

Social Well-Being (Italy Sample Only). The 5-item social well-being subscale of the Italian version of the Mental Health Continuum— Short Form (MHC-SF; Petrillo, Capone, Caso, & Keyes, 2015) was utilized to assess participants' appraisals of their functioning in social life and as a member of a larger society. Participants reported how often during the past month they experienced a sense of social contribution (i.e., that you had something important to contribute to society), social integration (i.e., that you belonged to a community [like a social group, your school, or your neighborhood]), social actualization/growth (i.e., that our society is becoming a better place), social acceptance (i.e., that people are basically good), and social coherence (i.e., that the way our society works made sense to you). Participants responded on a 6-point Likert scale ranging from never to every day. A total

score was created by summing items, with higher scores reflecting higher levels of social well-being. The Italian version of the MHC and its subscales have demonstrated strong psychometric properties (Petrillo et al., 2015), and internal consistency for the social well-being subscale in the current Italy sample was good ($\alpha = .83$).

RESULTS

PRELIMINARY ANALYSES

Psychometric properties of primary study variables (i.e., estimated daily cellphone minutes; co-rumination via cellphone; co-brooding via cellphone; face-to-face co-rumination; anxiety; depression; social self-efficacy; social well-being, skewness and kurtosis indices of normality) for the U.S. and Italy samples are presented in Table 1. Inspection of skewness and kurtosis indices indicated that among primary study variables, only estimated daily cellphone minutes in the Italy sample exceeded thresholds for normality established by Field (2000; cut-off ± 2).

Independent samples t-tests were conducted to examine cross-cultural differences in primary study variables that were assessed in both samples and Cohen's d were computed as effect-size measures. Results are presented in Table 1. Estimated daily cellphone minutes were significantly higher in the U.S. sample compared to the Italy sample ($t_{(579)} = 7.89, p < .001, d = .68$). Co-rumination via cellphone ($t_{(588)} = 6.96, p < .001, d = .59$), co-brooding via cellphone ($t_{(579)} = 6.69, p < .001, d = .58$), face-to-face co-rumination ($t_{(588)} = 3.72, p < .001, d = .33$), anxiety ($t_{(577)} = 3.74, p < .001, d = .33$), and depression ($t_{(577)} = 3.83, p < .001, d = .33$) were significantly higher in the Italy sample compared to the U.S. sample.

Independent samples t-tests were conducted to examine gender differences in primary study variables.[1] Results are presented in Table 2. In the U.S. sample, women ($n = 149$) reported significantly higher levels of estimated daily cellphone minutes and face-to-face co-rumination compared to men ($n = 55$). In the Italy sample, women ($n = 164$) reported significantly higher levels of co-rumination via cellphone, co-brooding via cellphone, face-to-

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1. Univariate ANOVAs also were conducted to test gender × age interactions for primary study variables, and none were statistically significant.

TABLE 1. Descriptive Statistics and Independent Samples *t*-tests of Cross-Cultural Differences in Primary Study Variables

	United States Sample (N = 216)					Italy Sample (N = 375)					Cross-cultural differences		
	M (SD)	Range	α	Skewness	Kurtosis	M (SD)	Range	α	Skewness	Kurtosis	t	p	d
Estimated daily cellphone minutes	176.54 (122.93)	0–720	—	1.63	3.30	91.43 (127.26)	0–720	—	2.18	5.69	7.89	.000	.68
Co-rumination via cellphone	65.94 (20.84)	17–126	.96	.16	-.16	77.79 (19.35)	27–127	.95	-.33	.10	6.96	.000	.59
Co-brooding via cellphone	14.44 (5.54)	6–29	.92	.42	-.23	17.64 (5.49)	6–30	.89	-.15	-.48	6.69	.000	.58
Face-to-face co-rumination	81.01 (21.22)	27–134	.95	-.11	-.13	87.38 (17.66)	33–127	.93	-.15	-.27	3.72	.000	.33
Anxiety—Trait	37.31 (10.11)	21–73	.91	1.15	1.67	40.75 (10.83)	21–84	.92	.48	.16	3.74	.000	.33
Depression	26.76 (13.35)	0–70	.93	.58	.10	31.18 (13.19)	0–69	.92	-.03	-.39	3.83	.000	.33
Social Self-Efficacy*	64.02 (10.12)	24–88	.90	-.73	.95								
Social Well-Being§						11.20 (5.52)	0–25	.83	.14	-.47			

Notes. *d* = Cohen's *d* effect size: .20 = small; .40 = medium: .80= large. *Social self-efficacy was measured only in the United States sample. §Social well-being was measured only in the Italy sample.

TABLE 2. Independent Samples *t*-tests of Gender Differences in Primary Study Variables

	United States Sample				Italy Sample			
	Women	Men	t^1	*p*	Women	Men	t^2	*p*
	M (SD)	*M (SD)*			*M (SD)*	*M (SD)*		
Estimated daily cellphone minutes	183.76 (117.38)	144.40 (129.75)	1.96	.051	96.09 (138.68)	87.70 (117.58)	.63	.532
Co-rumination via cellphone	68.52 (19.75)	63.44 (20.52)	1.61	.108	81.10 (18.94)	75.22 (19.32)	2.95	.003
Co-brooding via cellphone	14.64 (5.63)	13.84 (5.23)	.92	.359	18.36 (5.49)	17.08 (5.44)	2.25	.025
Face-to-face co-rumination	84.62 (20.42)	76.91 (17.36)	2.49	.014	90.45 (17.94)	84.99 (17.10)	3.00	.003
Anxiety—Trait	37.89 (10.67)	35.76 (8.30)	1.33	.184	42.32 (10.46)	39.54 (10.98)	2.49	.013
Depression	27.05 (13.68)	25.98 (12.51)	.51	.612	32.82 (13.60)	29.91 (12.74)	2.13	.034
Social Self-Efficacy	63.54 (10.29)	64.89 (9.65)	.85	.398				
Social Well-Being					10.02 (5.54)	12.11 (5.34)	3.71	.000

Notes. United States sample: women's *n* = 149; men's *n* = 55, missing gender data *n* = 12. Italy sample: women's *n* = 164; men's *n* = 211. t^1 *df* = 202; t^2 1 = 373

TABLE 3. Inter-Correlations among Primary Study Variables for United States (N = 216) and Italy (N = 375) Samples

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Age	—	−.22***	.06	.07	.06	−.05	−.05	—	.07
2. Estimated daily cellphone mins.	−.03	—	.06	.09	.04	−.02	−.12*	—	.08
3. Co-rumination via cellphone	−.11	.21**	—	.91***	.62***	.09	−.02	—	.19***
4. Co-brooding via cellphone	−.11	.19**	.88***	—	.56***	.09	−.01	—	.17**
5. Face-to-face co-rumination	−.08	.12	.57***	.54***	—	.10	−.05	—	.09
6. Anxiety - Trait	.01	.02	.31***	.31***	.21**	—	.51***	—	−.16**
7. Depression	−.05	−.10	.18*	.17*	.08	.68***	—	—	−.32***
8. Social self-efficacy*	.07	.11	−.04	−.03	.19**	−.17*	−.23**	—	—
9. Social well-being§	—	—	—	—	—	—	—	—	—

Notes. United States sample correlations are presented below the diagonal. Italy sample correlations are presented above the diagonal. *p < .05; **p < .01; ***p < .001. *Social self-efficacy was measured only in the United States sample. §Social well-being was measured only in the Italy sample.

face co-rumination, anxiety, and depression, and significantly lower levels of social well-being, compared to men (n = 211).

In the United States sample, 95% of women and 66% of men endorsed having at least one female co-rumination partner. In the Italy sample, 86% of women and 51% of men endorsed having at least one female co-rumination partner. Chi-square analyses revealed that the likelihood of endorsing at least one female co-rumination partner was significantly higher than the likelihood of endorsing at least one male co-rumination partner among women in the U.S. sample, $\chi^2(1, n = 149) = 19.01, p < .001$; men in the U.S. sample, $\chi^2(1, n = 55) = 9.59, p = .002$; women in the Italy sample, $\chi^2(1, n = 164) = 30.98, p < .001$; and men in the Italy sample, $\chi^2(1, n = 211) = 55.10, p < .001$.

Participants' age was not correlated with any other variable in the U.S. sample. In the Italy sample, age was inversely correlated with estimated daily cellphone minutes ($r = −.22, p < .001$). Bivariate correlations among primary study variables are presented in Table 3. Of particular note, estimated daily cellphone minutes was significantly and positively correlated with co-rumination via cellphone in the U.S. sample only ($r = .21, p = .002$). Co-rumination via cellphone and face-to-face co-rumination were positively correlated in the U.S. sample ($r = .57, p < .001$) and the Italy sample ($r = .62, p < .001$).

TABLE 4. Hierarchical Multiple Regression Analyses for Co-rumination Predicting Anxiety

Predictors	United States Sample (N = 216)					Italy Sample (N = 375)				
	R^2	ΔR^2	ß	t	p	R^2	ΔR^2	ß	t	p
Block 1	.01	.01				.02	.02*			
Gender[1]			.09	1.33	.184			.12	2.37	.018
Block 2	.01	.00				.02	.00			
Gender			.09	1.31	.193			.12	2.38	.018
Estimated daily cellphone mins.			.01	.08	.937			−.02	−.39	.695
Block 3	.11	.10***				.02	.00			
Gender			.06	.84	.403			.11	2.05	.041
Estimated daily cellphone mins.			−.06	.80	.427			−.03	.47	.637
Co-rumination via cellphone			.28	3.60	.000			.03	.37	.709
Face-to-face co-rumination			.07	.85	.395			.07	1.10	.271

Notes. [1]Men = 1, Women = 2. *$p < .05$; **$p < .01$; ***$p < .001$.

HYPOTHESIS TESTING FOR CO-RUMINATION VIA CELLPHONE AND FACE-TO-FACE CO-RUMINATION

Hierarchical multiple regression analyses were utilized to test hypotheses. Given that gender differences were observed in several primary study variables, and that co-rumination via cellphone was significantly correlated with estimated daily cellphone minutes in the U.S. sample, the effects of gender and cellphone use were initially taken into account. Variables were entered in the following blocks: (1) gender (men = 1, women = 2); (2) estimated daily cellphone minutes; (3) co-rumination via cellphone and face-to-face co-rumination. Three regression analyses were conducted in each sample to examine the criterion variables of anxiety, depression, social self-efficacy (U.S. sample), and social well-being (Italy sample).

Anxiety. Results are presented in Table 4. In the U.S. sample, neither gender nor estimated daily cellphone minutes was a significant predictor. The third block accounted for 10% of unique variance in anxiety. The only significant predictor was co-rumination via cellphone, which was positively associated with anxiety (β = .28, $t = 3.60$, $p < .001$). The regression model accounted for 11% of the variance in anxiety.

TABLE 5. Hierarchical Multiple Regression Analyses for Co-rumination Predicting Depression

Predictors	United States Sample (N = 216)					Italy Sample (N = 375)				
	R^2	ΔR^2	ß	t	p	R^2	ΔR^2	ß	t	p
Block 1	.01	.01				.02	.02*			
Gender[1]			.04	.51	.612			.13	2.43	.016
Block 2	.01	.01				.03*	.01*			
Gender			.05	.70	.485			.13	2.52	.012
Estimated daily cellphone minutes			−.10	1.43	.153			−.12	2.30	.022
Block 3	.05	.04*				.04	.01			
Gender			.03	.47	.637			.14	2.69	.008
Estimated daily cellphone minutes			−.14	1.96	.051			−.12	2.26	.025
Co-rumination via cellphone			.21	2.53	.012			.02	.32	.751
Face-to-face co-rumination			−.01	.12	.903			−.09	1.31	.192

Notes. [1]Men = 1 Women = 2. *p < .05 ; **p < .01 ; ***p < .001.

In the Italy sample, gender accounted for 2% of the variance in the first block (β = .12, t = 2.37, p = .018). No other significant predictors emerged. The regression model accounted for 2% of the variance in anxiety.

Depression. Results are presented in Table 5. In the U.S. sample, only co-rumination via cellphone emerging as a significant predictor, which was positively associated with depression (β = .21, t = 2.53, p = .012) and accounted for 4% of unique variance. The overall regression model accounted for 5% of the variance in depression.

In the Italy sample, gender accounted for 2% of the variance in the first block (β = .13, t = 2.43, p = .016); female gender was associated with higher levels of depression. Estimated daily cellphone use was significantly, inversely associated with depression in the second block (β = −.12, t = 2.30, p = .022), accounting for an additional 1% of unique variance. No significant predictors emerged in the third block. The regression model accounted for 4% of the variance in depression.

Social Self-Efficacy and Social Well-Being. Results are presented in Table 6. In the U.S. sample, neither gender nor cellphone use was a significant predictor of social self-efficacy. In the third block, higher levels of co-rumination via cellphone were significantly associated with lower levels of social self-efficacy (β = −.19, t =

TABLE 6. Hierarchical Multiple Regression Analyses for Co-rumination Predicting Social Self-efficacy (United States Sample) and Social Well-being (Italy Sample)

Predictors	United States Sample (N = 216)					Italy Sample (N = 375)				
	R^2	ΔR^2	ß	t	p	R^2	ΔR^2	ß	t	p
Block 1	.00	.00				.04	.04***			
Gender[1]			−.06	.85	.398			−.19	3.64	.000
Block 2	.02	.02				.04	.00			
Gender			−.08	1.11	.284			−.19	3.70	.000
Estimated daily cellphone mins.			.12	1.68	.094			.08	1.59	.112
Block 3	.08	.06**				.09	.04***			
Gender			−.11	1.52	.131			−.22	4.33	.000
Estimated daily cellphone mins.			.13	1.81	.072			.07	1.38	.168
Co-rumination via cellphone			−.19	2.38	.018			.22	3.43	.001
Face-to-face co-rumination			.29	3.66	.000			−.01	.17	.851

Notes. [1]Men = 1 ; Women = 2.*$p < .05$; **$p < .01$; ***$p < .001$.

2.38, $p = .018$), and higher levels of face-to-face co-rumination were significantly associated with higher levels of social self-efficacy (β = .29, $t = 3.66$, $p < .001$). This regression model accounted for 8% of the variance in social self-efficacy.

In the Italy sample, gender accounted for 4% of the variance in social well-being (β = −.19, $t = 3.64$, $p < .001$); female gender was associated with lower levels of social well-being. Cellphone use was not a significant predictor in the second block, but in the third block higher levels of co-rumination via cellphone were significantly associated with higher levels of social well-being (β = .22, $t = 3.43$, $p = .001$). This regression model accounted for 9% of the variance in social well-being.

HYPOTHESIS TESTING FOR CO-BROODING VIA CELLPHONE

Hierarchical multiple regression were utilized to test gender as a moderator in the association of co-brooding via cellphone with anxiety and depression. Variables were entered in the following blocks: (1) co-brooding via cellphone; (2) gender (men = 1, women = 2); (3) interaction of co-brooding via cellphone × gender.

Anxiety. Results are presented in Table 7. In the U.S. sample, in the first block co-brooding via cellphone was significantly, positively associated with anxiety (β = .31, $t = 4.57$, $p < .001$),

TABLE 7. Hierarchical Multiple Regression Analyses Testing Gender as a Moderator of the Association between Co-brooding via Cellphone and Anxiety

Predictors	United States Sample (N = 216)					Italy Sample (N = 375)				
	R^2	ΔR^2	ß	t	p	R^2	ΔR^2	ß	t	p
Block 1	.09	.09***				.01	.01			
Co-brooding via cellphone			.31	4.57	.000			.09	1.70	.090
Block 2	.10	.01				.02	.01*			
Co-brooding via cellphone			.30	4.49	.000			.07	1.43	.153
Gender[1]			.07	1.10	.272			.12	2.31	.021
Block 3	.11	.01				.02	.00			
Co-brooding via cellphone			−.04	.15	.881			.08	.52	.606
Gender			−.15	.77	.440			.13	.73	.464
Co-brooding via cellphone × Gender			.43	1.24	.215			−.01	.06	.957

Notes. [1]Men = 1 ; Women = 2. *p < .05 ; **p < .01 ; ***p < .001.

accounting for 9% of the variance. Neither gender nor the interaction term was significant, and the overall regression model accounted for 11% of the variance in anxiety.

In the Italy sample, co-brooding via cellphone was not significantly associated with anxiety. In the second block, gender accounted for 1% of unique variance in anxiety (β = .12, t = 2.31, p = .021); female gender was associated with higher levels of anxiety. The interaction term was not significant. This regression model accounted for 2% of the variance in anxiety.

Depression. Results are presented in Table 8. In the U.S. sample, in the first block co-brooding via cellphone was significantly, positively associated with depression (β = .17, t = 2.45, p = .014), accounting for 3% of the variance. Neither gender nor the interaction term was significant, and the overall regression model accounted for 3% of the variance in depression.

In the Italy sample, co-brooding via cellphone was not a significant predictor of depression. Gender was a significant predictor in the second block, accounting for 1% of unique variance (β = .11, t = 2.18, p = .030); female gender was associated with higher levels of depression. The interaction term was not significant. This regression model accounted for 1% of the variance in depression.

TABLE 8. Hierarchical Multiple Regression Analyses Testing Gender as a Moderator of the Association between Co-brooding via Cellphone and Depression

Predictors	United States Sample (N = 216)					Italy Sample (N = 375)				
	R^2	ΔR^2	ß	t	p	R^2	ΔR^2	ß	t	p
Block 1	.03	.03*				.00	.00			
Co-brooding via cellphone			.17	2.45	.014			−.01	.27	.788
Block 2	.03	.00				.01	.01*			
Co-brooding via cellphone			.17	2.44	.016			−.03	.52	.604
Gender[1]			.03	.36	.722			.11	2.18	.030
Block 3	.03	.00				.01	.00			
Co-brooding via cellphone			.28	.96	.338			.08	.48	.631
Gender			.10	.50	.619			.23	1.30	.195
Co-brooding via cellphone × Gender			−.14	.40	.690			−.17	.69	.492

Notes. [1]Men = 1 ; Women = 2. *p < .05 ; **p < .01; ***p < .001.

DISCUSSION

The results of this study build upon evidence from previous research (Murdock et al., 2015) that emerging adults engage in co-rumination not only in their face-to-face interactions, but also through cellphone-mediated communications. Findings suggest that cross-cultural differences exist in the rates and correlates of co-rumination via cellphone for emerging adults in the U.S. and Italy. Namely, in spite of the fact that Italian students endorse higher levels of co-rumination via cellphone than their peers in the U.S., it appears to be more problematic for the psychosocial functioning of students in the U.S.

PATTERNS IN CO-RUMINATION RATES AND PARTNER CHOICE

Hypothesis 1a, regarding gender differences in co-rumination, was partially supported. Only women in the Italy sample endorsed significantly higher levels of co-rumination via cellphone than their male counterparts. In the only previous study to analyze gender differences in this construct, 18–22-year-old women in the U.S. endorsed higher levels of co-rumination via cellphone than their male peers (Murdock et al., 2015). Thus, gender differences in co-rumination via cellphone deserve further research

attention. As expected, women in both samples endorsed significantly higher levels of face-to-face co-rumination when compared to men in their respective samples.

Hypothesis 1b, regarding gender differences in self-identified co-rumination partners, was supported in both samples. Men and women in the U.S. and Italy endorsed having at least one female co-rumination partner at significantly higher rates than they endorsed having at least one male co-rumination partner. Barstead and colleagues (2013) similarly found that emerging adults in the U.S. were more likely to self-identify a female as a closest confidant and to engage in co-rumination with that person.

ASSOCIATIONS OF CO-RUMINATION WITH ANXIETY, DEPRESSION, AND SOCIAL FUNCTIONING

As predicted in Hypothesis 2a, co-rumination via cellphone and face-to-face co-rumination were significantly correlated with one another. In both samples, this was a moderate positive correlation, suggesting that the two constructs are related but not entirely overlapping. It is not surprising that co-ruminative tendencies show some consistency across modes of communication, as ruminative tendencies have been conceptualized as trait like manifestations of a core perseverative style (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). In interpreting the moderate correlation between face-to-face and cellphone-mediated co-rumination, it is interesting to note that in a recent global poll, emerging adults reported engaging in digital communication more frequently than face-to-face communication (Bradbury, 2017). However, in the current study, mean levels of self-reported rates of face-to-face co-rumination were higher than levels of co-rumination via cellphone in both U.S. and Italy samples. This may indicate that co-rumination emerges more readily during face-to-face conversations when they are available, but this question remains to be investigated.

Hypothesis 2b was partially supported in the U.S. sample and unsupported in the Italy sample. Among American students, higher levels of co-rumination via cellphone were associated with higher levels of anxiety and depression, but face-to-face co-rumination was not associated with anxiety or depression.

Among Italian students, neither mode of co-rumination was a significant predictor of anxiety or depression. In interpreting these findings, it is useful to consider the results of a recent study by Ames-Sikora and colleagues (2017). These authors found evidence for nonlinear associations between co-rumination and depression, and for differential effects of co-rumination across co-rumination partners (i.e., friend, sibling, romantic partner, or parent). Whereas moderate levels of co-rumination with a friend or sibling were associated with the lowest levels of depression in a sample of American undergraduate students, very low and very high levels of co-rumination with these partners were associated with high levels of depression. In contrast, there was a significant positive linear relationship between co-rumination with a romantic partner and depression. Thus, it is possible that in the current samples, nonlinear associations of face-to-face co-rumination (or of co-rumination via cellphone in the Italy sample) with depression and anxiety were undetected by the linear analytic approach. Additionally, such associations may be moderated by co-rumination partner. It will be important for future co-rumination studies to test curvilinear and moderational models in order to illuminate such nuances.

In the exploration of social self-efficacy in the U.S. sample, Hypothesis 2c was partially supported. Co-rumination via cellphone was significantly associated with social self-efficacy, but in the opposite direction as expected; higher levels of cellphone-mediated co-rumination were associated with lower levels of self-efficacy. However, as expected, higher levels of face-to-face co-rumination were associated with higher levels of social self-efficacy. Thus, engaging in co-rumination via cellphone was linked with more negative self-appraisals of social understanding and skill, whereas engaging in face-to-face co-rumination was linked with more positive appraisals of these capacities. There are several possible interpretations of these disparate findings for the two modalities of co-rumination. For instance, the inverse association between cellphone-mediated co-rumination and social self-efficacy may arise from a third variable, such as social anxiety, which predisposes some individuals with low social self-efficacy to choose technology-mediated forms of communication over face-to-face communication (Enez Darcin et al., 2016). Alternately, it is possible that social benefits of face-to-face co-rumination are driven by elements of physical close-

ness that are absent in cellphone-mediated interactions, such as eye contact or nonverbal cues. Finally, the perpetual availability of cellphone contact may prolong co-ruminative interactions to the point that they elicit negative social feedback or other costs (Starr, 2015), thus undermining an individual's sense of social self-efficacy. It will be useful for future research to clarify the direction of associations between co-rumination via cellphone and multiple aspects of social skill, problem-solving, and self-competence.

With respect to the exploration of social well-being in the Italy sample, Hypothesis 2c was partially supported. Higher levels of co-rumination via cellphone were associated with higher levels of social well-being, but face-to-face co-rumination was not significantly associated with social well-being. Although it appears that no previous studies have examined social correlates of co-rumination in Italian emerging adults, these results reinforce those of Keshishian and colleagues (2016), in which American students' co-rumination in phone conversations was positively associated with an indicator of social well-being (i.e., friendship quality). As noted above, the lack of a significant linear relationship between face-to-face co-rumination and social well-being in this study may stem from an unexamined nonlinear or moderational effect. In fact, Ames and colleagues (2017) found a positive decelerating association between co-rumination and perceived social support in their sample of American undergraduates. That is, the significant positive relationship between co-rumination (with any partner) and perceived social support became weaker as the level of co-rumination increased, with no significant relationship at the highest levels of co-rumination. Investigation of quadratic effects of co-rumination will be important as its social correlates are further explored.

The results of Hypotheses 2b and 2c, along with previous findings by Murdock and colleagues (2015), demonstrate that indicators of psychosocial functioning were more consistently associated with co-rumination via cellphone than with face-to-face co-rumination. Thus, co-rumination via cellphone may deserve particular attention in considering maladaptive and adaptive elements of emerging adults' cellphone-mediated communications in the U.S.

ASSOCIATIONS OF CO-BROODING VIA CELLPHONE WITH ANXIETY AND DEPRESSION

In order to explore aspects of co-rumination via cellphone that may account for sociocultural differences in its association with psychosocial functioning, and following from Bastin and colleagues' (2018) findings for adolescents, we tested theoretical models in which gender was expected to moderate positive associations of co-brooding via cellphone with anxiety and depression.

As predicted in Hypothesis 3a, women in both samples endorsed significantly higher levels of co-brooding than men. In partial support of Hypothesis 3b, higher levels of co-brooding were significantly associated with higher levels of anxiety and depression in the U.S. sample, but this association was not moderated by gender. Hypothesis 3b was not supported in the Italy sample. Over and above the variance accounted for by co-brooding, gender was a significant predictor of both anxiety and depression for Italian students.

Thus, these samples provide no support for a differential relationship between co-brooding and anxiety or depression for women versus men during the developmental period of emerging adulthood. Instead, given the bivariate correlations of co-rumination and co-brooding with anxiety and depression in the U.S. sample, it seems that the co-brooding dimension largely drove the association of co-rumination with these outcomes. In the Italy sample, variation in anxiety and depression was chiefly accounted for by gender alone.

SOCIOCULTURAL CONSIDERATION OF RESULTS

Gender emerged as a particularly salient correlate of co-rumination and psychosocial functioning among Italian students in this study, whereas it explained less variation in the experiences of students in the U.S. Female students in Italy endorsed significantly higher levels of co-rumination via cellphone, co-brooding via cellphone, face-to-face co-rumination, anxiety, and depression, as well as lower levels of social well-being, when compared

to their male counterparts. Similar gender-based differences previously have been found in Italian undergraduate students with respect to face-to-face co-rumination, depression, and anxiety (Balsamo, Carlucci et al., 2015; Carlucci et al., 2018). Furthermore, de Waure, Soffiani, Virdis, Poscia, and Di Pietro (2015) found that among Italian emerging adults, females reported higher levels of somatic and psychological symptoms and lower self-perceived ability to solve problems when compared to males. Finally, validation studies of the Padua Inventory, which measures obsessive-compulsive tendencies, found that females scored significantly higher than their male counterparts in Italy (Sanavio, 1988), but not in the U.S. (Sternberg & Burns, 1990). Although it is beyond the scope of this study to investigate societal foundations for psychosocial gender disparities in Italy, future studies should examine such factors and consider if separate theoretical models are necessary to sensitively account for co-rumination pathways among women versus men.

Cross-cultural differences emerged in the current study as well. Most notably, although co-rumination via cellphone was consistently associated with poorer psychosocial functioning in U.S. emerging adults, it was significantly correlated only with social well-being among Italian emerging adults. This is particularly interesting given that Italian emerging adults endorsed higher levels of co-rumination via cellphone, co-brooding via cellphone, face-to-face co-rumination, anxiety, and depression, compared to their U.S. counterparts. Unless the current self-report methodology was vulnerable to thus unknown, stable cross-cultural differences in reporting bias (i.e., Italians tend to overestimate while individuals in the U.S. tend to underestimate their experiences of these psychosocial constructs), it appears that there could be fundamental differences in the nature of cellphone-mediated co-rumination across these cultural settings. For instance, students in the U.S. sample estimated that they used their cellphones for approximately twice as many minutes per day (2.9 hours) than students in Italy (1.5 hours). It is unclear if cross-cultural differences exist in access to wifi and/or cellular data, and future studies should explore if this may drive differential rates of cellphone use. Regardless, one may speculate that co-rumination via cellphone takes on maladaptive qualities when it occurs within a more cellphone-saturated lifestyle, even if the quantity of co-ruminative interactions is relatively low.

Culturally-specific nuances in the cognitive processing of negative emotions or life events also may underlie the disparate results for emerging adults in Italy and the U.S. in the current study. For instance, Grossmann and Kross (2010) compared the self-reflective processes of Russian and American emerging adults. They found that cross-cultural differences in emotional distress (i.e., Russian's lower levels of distress when compared to Americans) could be accounted for by Russians' increased usage of self-distanced perspectives (i.e., adopting an outsider's point of view) as they reflected upon emotionally arousing experiences. Cultural norms surrounding emotional experiences also may play a role in the form or function of co-rumination across cultures. Bastian, Kuppens, De Roover, and Diener (2014) examined college students in 47 countries and found that living in a country that values positive emotions was associated with greater life satisfaction. However, this effect was attenuated for individuals who experienced higher levels of negative emotion. The authors posited that experiencing negative emotion in a context that highly values positive emotion may set the stage for ruminative and maladaptive cognitive patterns. Support for this notion was provided by a recent study conducted with Australian and American undergraduates. Using experimental and survey designs, McGuirk, Kuppens, Kingston, and Bastian (2017) found environmental cues and emotional norms that overemphasize happiness (i.e., seeking positive emotion and avoiding negative emotion) were associated with increased rumination and compromises in well-being. Although a comparative analysis of norms regarding the promotion of happiness in the U.S. versus Italy has not been conducted, this cultural characteristic may help to account for different rates and implications of co-rumination via cellphone in the current cross-cultural study.

STUDY LIMITATIONS

Several methodological characteristics of the current study should be considered in interpreting its findings. First, questionnaire measures were utilized to measure all constructs, which increases the likelihood of self-report bias and/or reporter error. Questionnaires were administered to participants in a standard order, and thus order effects were not controlled. Some differenc-

es existed between the U.S. and Italy samples in terms of recruitment and assessment methods and participant age (i.e., the U.S. sample was younger). The cross-sectional nature of the current data precludes drawing firm conclusions about the direction of effects between co-rumination and psychosocial functioning. For instance, it is possible that emerging adults with higher levels of anxiety or depression choose to engage in cellphone-mediated co-rumination in an attempt to avoid or minimize stress they experience during face-to-face interactions.

Although most research on co-rumination has shared these methodological flaws, there are notable exceptions in which longitudinal (Bastin et al., 2018; Hankin, Stone, & Wright, 2010) and experimental designs (Zelic, Ciesla, Dickson, Hruska, & Ciesla, 2017) have been utilized. Objective measures of constructs should be explored in future research. For instance, self-reports of technology-related behaviors are prone to error (Junco, 2013), a phenomenon that may be reflected in the markedly lower estimates of average daily cellphone minutes made by students in the current study compared to those reported in previous studies in the U.S. (Roberts et al., 2014) and Italy (Lopez-Fernandez et al., 2017). With the advent of online cellphone use tracking applications, it should be possible to measure this construct objectively in the future. Likewise, co-rumination via cellphone could be investigated using content analysis of actual text messages instead of subjective self-reports of general behavioral tendencies, which can be problematic (Junco, 2014).

The generalizability of current results is limited by several factors. First, the U.S. sample was demographically homogeneous, consisting of predominantly White, full-time, residential students drawn from a small and academically rigorous college environment in a small town. The Italy sample was drawn from a larger university serving a broader swath of full time and part time, residential and commuter students in an urban setting. Lastly, questionnaires were administered in the two samples using different methods of administration (online versus paper and pencil methods). Therefore, observed differences in the two samples may have stemmed from these factors instead of or in addition to factors related to national or cultural membership. As regards the comparability of two methods of administration,

a recent meta-analysis (Dodou & de Winter, 2014) showed that paper and pencil and web-based methods result to be psychometrically equivalent, particularly when methodological considerations such as recruitment strategies and administration methodologies are held constant (Weigold, Weigold, & Russell, 2013). However, differences in university communities may affect co-rumination patterns and pathways. For instance, co-rumination has been associated with the generation of interpersonal dependent stress (i.e., stressful experiences or events that stem from the characteristics or actions of the individual; Hankin et al., 2010), the effects of which may be magnified for students in a small residential community. Within-group variation could not be investigated in the current study due to the collection of limited demographic data.

Future research should deepen the exploration of mechanisms through which co-ruminative interactions become problematic for emerging adults. For instance, a recent meta-analysis found that problematic cellphone use (i.e., characterized by addictive or compulsive qualities) was a more robust mediator of the association between overall phone use and anxiety than other potential mediators (e.g., geographical location, age, or type of stress; Vahedi & Saiphoo, 2018). Thus, within a context of problematic cellphone use, co-rumination via cellphone may represent a particularly maladaptive form of coping with stressors or loneliness (Choliz, 2010). Furthermore, modalities of co-rumination may be differentially related to specific aspects of negative affective experiences. For instance, face-to-face co-rumination may be more strongly linked with trait somatic anxiety, due to an increased likelihood of physiological activation during in-person contact, whereas co-rumination via cellphone may be more strongly linked with trait cognitive anxiety, due to an increased opportunity to reflect upon aspects of an unfolding interaction. Either modality of co-rumination may be more strongly related to anxiety as a transitory emotion to a greater degree than anxiety as a stable trait. Furthermore, future studies should investigate co-rumination via specific types of cellphone use (e.g., texting, calling, social media), as these activities may be differentially related to affective states. Clarification of such nuances could elucidate behavioral strategies that would be most helpful in preventing psychosocial problems.

CONCLUSIONS

This study has expanded the investigation of co-rumination by focusing on cellphone-mediated co-rumination within two cultural contexts. Differential rates and correlates of co-rumination via cellphone were found in the U.S. versus Italy and in emerging adult women versus men. Of particular note, self-reported rates of co-rumination via cellphone were higher among college students in Italy than in the U.S., but this type of interaction was more consistently associated with compromises in psychosocial functioning in the U.S. than in Italy. These results highlight the importance of examining the sociocultural contexts and mechanisms that shape co-ruminative behaviors and their psychosocial sequelae.

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