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Loneliness and Hostility in Older Adults: A Cross-Lagged Model

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Loneliness takes a meaningful toll on individuals' physical and mental well-being. One of its possible consequences is the perception that others are not to be trusted and are a source of wrongdoing, defined as cynical hostility. At the same time, cynical hostility could also deter individuals from seeking the comfort of close social relationships. We use the Health and Retirement Study to test a cross-lagged model of hostility and loneliness in a sample of 7500 older adults. The results suggest that there are bidirectional associations between hostility and loneliness. The findings are discussed in light of existing theories on human development, and practical implications are suggested.

Keywords: cross-lagged, loneliness, hostility, longitudinal, HRS

Loneliness is defined as the perception of inadequate social relationships and has been described as a driving force for seeking social interactions (Cacioppo et al., 2006). Hostility is defined as a cognitive tendency to view others as harmful or dissatisfying. Both loneliness and hostility are social schemas, and as such, might reciprocally affect one another. Similarly, both loneliness and hostility have been linked to various negative psychological and health related outcomes, with the potential to have adverse effects that are especially prominent in older adulthood.

This study used two waves of the Health and Retirement Study (HRS) and a cross-lagged model to empirically examine the bidirectional relationships between these variables in a sample of 7500 respondents. By doing so, we elucidate the potential mechanisms that contribute to the feelings of loneliness and hostility, and add to the current knowledge regarding the reciprocal relationships between negative states of important implications for individuals' social life and well-being.

Loneliness

Loneliness represents the distressing feeling of unmet social needs. Loneliness can be quantitative in nature, relating to the number of social ties, or qualitative—relating to desired versus achieved levels of intimacy (Hawkey & Cacioppo, 2010; Peplau & Perlman, 1982; Pinquart & Sorensen, 2001). The purpose of this distress is to maintain social connectedness, even when sociability does not bear immediate instrumental rewards for the individual.

According to the evolutionary perspective, the need for social contact creates social structures that protect their inhabitants and thus enables the survival of human beings (Cacioppo et al., 2006).

Loneliness has been extensively examined in research, and numerous studies have described its harmful consequences for physical and emotional well-being. In a meta-analysis, loneliness and social isolation have been found to substantially increase the risk of cardiovascular diseases and stroke (Valtorta, Kanaan, Gilbody, Ronzi, & Hanratty, 2016). Loneliness has also been linked to increased functional limitations (Perissinotto, Stijacic Cenzer, & Covinsky, 2012), decreased sleep quality and satisfaction (Friedman et al., 2005; Jacobs, Cohen, Hammerman-Rozenberg, & Stessman, 2006), harmful health behaviors (Hawkey, Thisted, & Cacioppo, 2009), and an increased risk for mortality (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015).

Loneliness was also shown to have harmful consequences for mental health. In their review, Cacioppo and Hawkey (2009) argued that loneliness is a risk factor for poorer cognitive performance and faster cognitive decline, and it also serves as a risk factor for Alzheimer's disease (Wilson et al., 2007). In addition, loneliness is considered an important risk factor for depression (Cacioppo, Hawkey, & Thisted, 2010; Cacioppo, Hughes, Waite, Hawkey, & Thisted, 2006; Segel-Karpas, Ayalon, & Lachman, 2016).

According to the socioemotional selectivity theory, older adults tend to focus on those social relationships that are emotionally, rather than instrumentally meaningful to them. As such, decreases in the size of their social network may be expected, but these changes should not result in greater loneliness, as the remaining relationships bear unique emotional meaning to the older individual. Moreover, even if loneliness is experienced, it might be less negative as old people tend to experience negative emotions at lower levels of intensity (Carstensen, Isaacowitz, & Charles, 1999). On the other hand, old age might bring upon losses in one's social network - including losses of close social relationship due to widowhood or retirement. Aging is also expected to result in an increase in physical disability that may limit older adults' ability to

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maintain social relationships, and thus could result in greater isolation and loneliness (Pinquart & Sorensen, 2001).

Empirical studies suggest that loneliness may follow a nonlinear trajectory. Using data collected in 25 European countries, Yang and Victor (2011) have found that “frequent loneliness” increases with age, whereas occasional loneliness follows a u-shaped pattern, with lowest levels of loneliness in midadulthood and highest in younger and older adulthood. Similar results are reported using a U.K.-based sample (Victor & Yang, 2012). However, other cross-sectional studies have reported a steady decrease or little to no variation in loneliness across age groups (For review, see Victor & Yang, 2012), or a steady increase in loneliness with age from midlife to older adulthood (Hansen & Slagsvold, 2016). Likewise, longitudinal studies suggest an increase in loneliness among older adults (age 65 and over; Gerstorf, Ram, Lindenberger, & Smith, 2013; Hawkey & Kocherginsky, 2018). The increase is attributed to risk factors that are more prevalent in old age, such as disability and isolation, and not to intraindividual processes (Jylhä, 2004; Luhmann & Hawkey, 2016). The emotional, and especially the physical and cognitive consequences of loneliness may be particularly harmful to older adults, decreasing their well-being, quality of life, and the ability to experience successful aging (Pinquart & Sorensen, 2001; Rowe & Kahn, 1997).

Hostility

Hostility can be defined as a cognitive schema. It represents attitudes toward others, consisting of a set of beliefs relating to the ill-intentions of others and their denigration. In this paper, the focus is on cynical hostility, which is defined as the belief that people are driven by selfish motives, rather than by a genuine will to help others, and the belief that others are a “source of wrongdoing” (Smith, 1994, p. 26).

Age related trends in hostility are not as well explored as those related to loneliness. The limited research suggests that the cognitive aspects of hostility (mistrust and cynicism) increase with age from middle to older adulthood, although the self-report expressions of hostility seem to be inversely related to age. However, older adults were rated by professional judges as behaviorally more hostile (using the Interview Assessment of Hostility; Barefoot, Beckham, Haney, Siegler, & Lipkus, 1993) in comparison with middle-aged adults. This could suggest that older adults avoid admitting the expressions of hostility and anger due to social desirability. In contrast, they might feel more comfortable admitting hostile beliefs. Otherwise, it is possible that older adults are less hostile when provoked than younger adults, but more hostile in a nonthreatening situation such as an interview (Barefoot et al., 1993). Perceived greater vulnerability or reduced concerns with social norms relating to the expression of hostile attitudes may be responsible for the possible increase in self-reported hostility with age. It also is possible that cohort differences account for these findings. Shared experiences, such as the Great Depression or the World War II might have made those who lived through them more hostile. However, empirical research is lacking.

Hostility in older adulthood was mostly studied in the context of its adverse health outcomes. Hostility is continuously linked to coronary heart diseases and premature mortality (Smith, Glazer, Ruiz, & Gallo, 2004), inflammation (Graham et al., 2006), pul-

monary function (Kubzansky et al., 2006) and cellular aging (Brydon et al., 2012).

Loneliness and Hostility

Loneliness and hostility are somewhat similar. Both are cognitive schemas of the self in relation to others. While lonely individuals perceive others as not close enough to fulfill one’s social and emotional needs, hostile individuals perceive others as untrustworthy and driven by selfish motives, and thus, believe that approaching relationships with others warrants caution. Loneliness and hostility are also similar in that both are characterized by the perception of separation from others. However, whereas loneliness is characterized by yearning for social relationships, hostility is characterized by a feeling of separation resulting from the basic mistrust in others (Griffin, Mezuk, Williams, Perrin, & Rybarczyk, 2018). Both highly hostile and lonely individuals could be vulnerable due to their inability to gain support when needed, as they potentially lack social relations. Finally, both loneliness and the cognitive aspects of hostility have been found to increase with age (for loneliness, as mentioned, the results are less consistent, but generally there seems to be an increase after the age of 65), and both bear negative health related outcomes, that could be especially prominent in aging adults (Cacioppo et al., 2006; Cacioppo & Hawkey, 2009; Smith & Ruiz, 2002).

According to Cacioppo’s evolutionary model, loneliness triggers a feeling of insecurity, causing the lonely person to stay ‘on guard,’ and heightens his or her propensity to identify and respond to threats. The heightened sensitivity to threats may cause lonely individuals to adopt defensive and rejective behaviors and attitudes such as hostility and anger for the sake of self-preservation.

Cacioppo and Hawkey (2005) also suggest that loneliness is a cognitive schema, acting as a prism through which the social world is perceived and interpreted. Lonely individuals tend to evaluate their relationship with others in more negative ways (Duck, Pond, & Leatham, 1994), and these negative interpretations might potentially push them to express distrust (Rotenberg, 1994) and hostile attitudes.

Loneliness can also be conceptualized as a cognitive mismatch between desired and obtained social relationships. The distressing tension can be labeled as a cognitive dissonance, resulting in pressure to balance it with new or modified cognitions (Festinger, 1962). Hostility is a cognitive coping mechanism adding information that is meant to help restore the balance by denigrating one’s need of others. The literature that concerns coping methods with loneliness suggests that in addition to the acceptance of loneliness that leads to inner search and increased reflection and intimacy with the self, older adults also perceive distancing and denial to be beneficial coping strategies when facing loneliness (Rokach, Orzeck, & Neto, 2004; Rokach, 2001). Hostility could be one such coping strategy—when one denies his or her needs of companionship by denigrating the potential to benefit from social relationships. In other words, increased hostility suggests that individuals “downplay” the importance of others, thus decreasing the perceived gap between desired and obtained social relationships expressed as loneliness.

Finally, the longing for intimacy and social connectedness that characterizes loneliness also creates emotional vulnerability. The need of others implies dependence, as the fulfillment of the need

rests on others' willingness to respond (Kelley et al., 2003). The failure in gaining the intimacy needed could result in feelings of anger toward those perceived as unwilling to meet one's need for relationship (Feeney, 2005; Lemay Jr., Overall, & Clark, 2012), and thus, result in greater hostility.

At the same time, hostility could predict increased loneliness. The basic cognition that people are to be distrusted is at the heart of hostile attitudes. This cognitive schema could deter those high in hostility from seeking social connections, even when they desire so, resulting in heightened levels of loneliness. Empirical studies connecting hostility and social relationships find that hostility is related to lower levels of social support, and to decreased ability to benefit from the support received (Chen, Gilligan, Coups, & Contrada, 2005; Lepore, 1995). The expression of hostility could also deter others, deeming the hostile person an unattractive social counterpart, and hence, also decreasing the hostile individual's ability to engage in social interactions, resulting in his or her loneliness.

The Present Study

Despite potential intersections and important theoretical pathways which possibly connect loneliness and hostility, to the best of our knowledge, the reciprocal relationship between hostility and loneliness has not been examined. Theoretically, this investigation could lead to a greater understating of how social-cognitive schemas reciprocally affect one another. Practically, both loneliness and hostility, as well as any association between them, could greatly harm older adults' well-being and ability to age successfully while maintaining high levels of physical and mental health, social activity, and allowing a sense of resolution (Ryff, 1982; Rowe & Kahn, 1997). Examining the temporal association between loneliness and hostility could also potentially lead to the development of clinical interventions aimed at addressing these conditions. For instance, if we identify loneliness as a potential contributor to hostility, interventions that aim to reduce hostility would benefit from incorporating a component which addresses loneliness. Alternatively, it might be important to address hostility in any intervention which targets skills or cognitions to reduce loneliness.

Method

Sample

Data were derived from two waves of the Health and Retirement Study (HRS) collected in 2008 and 2012. The HRS is a longitudinal panel study, conducted every two years since 1992. It is based on a stratified multistage area probability sample of US households. Initial inclusion criteria for the HRS was set as a household member born between 1931 and 1941. Over the years, the sample was refreshed to preserve representation of the adult population in the US. For details on the HRS samples, please see <http://hrsonline.isr.umich.edu/>. In 2006, the HRS team assigned half the sample to participate in an additional lifestyle and psychological questionnaire, left behind by the interviewer to allow participants to privately answer the questions, asking them to return it by mail. The 'leave behind' questionnaire is assigned to each half of the sample every other wave. Hence, longitudinal data are available on a 4-year interval. Response rates were 88.4% and

89.1% in 2008 and 2012, respectively. The present sample included 7,500 observations ($M(\text{age}) = 67.77$). Attrition analysis revealed minor differences in loneliness and hostility levels between those who completed the scales in both waves and those who did not complete the loneliness and hostility questionnaires at the second wave of data collection. T1 loneliness was 1.50 for those who completed both waves ($N = 4635$), and 1.59 for those who did not participate at the second wave ($N = 795$; $t_{(5428)} = 5.73$, $p < .001$); Hostility was 1.13 for those who completed both waves ($N = 4607$) and 1.15 for those who participated only in the first wave ($N = 796$; $t_{(5441)} = 4.20$, $p < .001$).

Measurements

Loneliness was assessed using an abbreviated version of the Revised UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980). The HRS version included 11 items such as "you lack companionship," which were rated on a 1 "hardly ever or never" to 3 "often" scale ($\alpha = .88$ and $\alpha = .87$ for 2008 and 2012, respectively; Scale range: 1–3).

Cynical hostility was measured using 5 items from the Cook-Medley Hostility Inventory (Cook & Medley, 1954; Costa, Zonderman, McCrae, & Williams, 1986). Example items are: "Most people dislike putting themselves out to help other people" and "I think most people would lie in order to get ahead." Items were rated on a 1 "strongly disagree" to 6 "strongly agree" scale ($\alpha = .79$, $\alpha = .77$ in 2008 and 2012, respectively; Scale range: 1–6).

We controlled for respondents' age, gender, marital status (1 = married, 0 = not married) and years of education. We controlled for the frequency of depressive symptoms, measured using the shortened version of the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The short form of the CES-D used in the HRS is an 8-item version. Respondents are asked whether they had experienced a list of depressive symptoms during "much of the time in the past week." The number of "yes" responses is summed to create a depressive symptoms score. For the purpose of this study, we omitted the statement "felt lonely" ($\alpha = .781$ and $\alpha = .785$ for 2008 and 2012, respectively; Scale ranged from 0–7). We controlled for participants' social contacts—measured as the frequency of contact with one's children, other family members and friends as we were interested in the subjective feeling of loneliness, and not the actual involvement in social relationships. For each of the contact-subjects, respondents were asked to rate on a scale ranging from 1 "less than once a year or never" to 6 "three or more times a week" the frequency in which they a. meet b. speak on the phone. c. write or e-mail. Responses were summed to create a "total social contact" score. Finally, as both hostility and loneliness might be related to neuroticism (Peerenboom, Collard, Naarding, & Comijs, 2015; Smith, Traupman, Uchino, & Berg, 2010), we added it as a covariate. Neuroticism was assessed by respondents' rating the degree by which each of 4 adjectives describes them: worrying, moody, nervous and calm (reverse coded). Items ranged from 1 "not at all" to 4 "a lot," and were averaged to create the overall scale ($\alpha = .72$; range: 1–4).

Analysis

After calculating descriptive statistics (see Table 1), we used structural equation modeling with Mplus Version 7 (Muthén &

Table 1
Descriptive Statistics and Correlations Between Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	68.84	10.45												
2. Gender (1 = male)	.40	.49	.04***											
3. Education	12.47	3.22	-.13***	.04***										
4. Marital status T1 (1 = married)	.60	.48	-.19***	.23***	.11***									
5. Marital status T2 (1 = married)	.57	.49	-.19***	.24***	.12***	.84***								
6. ADL	.31	.84	.15***	-.04***	-.16***	-.12***	-.10***							
7. CES-D T1	1.28	1.75	-.02	-.09***	-.19***	-.15***	-.16***	.33***						
8. Social contact T1	30.39	8.23	-.07***	-.16***	.18***	.06***	-.08***	-.08***	-.11***					
9. Neuroticism	2.04	.62	-.11***	-.10***	-.13***	-.00	-.02	.14***	.39***	-.08***				
10. Hostility T1	2.95	1.14	-.11***	.15***	-.25***	-.01	-.01	.08***	.21***	-.23***	.21***			
11. Loneliness T1	1.52	.43	-.03***	.04***	-.17***	-.13***	-.12***	.16***	.38***	-.31***	.38***	.40***		
12. Hostility T2	2.85	1.10	-.08***	.14***	-.23***	-.04***	-.03***	.10***	.20***	-.22***	.19***	.56***	.35***	
13. Loneliness T2	1.51	.42	-.001	.01	-.15***	-.12***	-.15***	.15***	.32***	-.28***	.32***	.62***	.39***	

Note. ADL = activities of daily living; CES-D = Center for Epidemiologic Studies Depression Scale.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Muthén, 1998–2012) to test the reciprocal associations between loneliness and hostility. The model allows the simultaneous evaluation of the effects of loneliness and hostility, while controlling for age, gender, education, marital status, depressive symptoms, social contact and neuroticism. Loneliness and hostility were modeled as latent variables, and the control variables were added as observed indicators. We used robust full-information maximum likelihood estimation (MLR) due to missing data. This method provides estimations based on all observations through the imputation of missing values. In all analyses, we allowed free estimations of factor loadings, and correlated the terms of uniqueness across the waves to account for consistency in the indicators' variance (Cole & Maxwell, 2003). Fit indices included chi-square statistics, the Tucker–Lewis index (TLI), the comparative fit index (CFI), and the root mean-square error of approximation (RMSEA).

Results

Descriptive statistics and correlations are presented in Table 1. As observed variables, loneliness at T1 was correlated with hostility at T2, $r = .35$, $p < .001$, and hostility at T1 was correlated with loneliness at T2, $r = .32$, $p < .001$. In the measurement model, T1 loneliness and T2 hostility were also correlated, $r = .45$, $p < .001$, and so were T1 hostility and T2 loneliness, $r = .43$, $p < .001$.

As a first step before testing the autoregressive model, we tested the measurement model of the two latent variables (e.g., loneliness and hostility), where each item loaded into its respective factor, and loadings were constrained over time. We first created 3 parcels for loneliness by computing the mean of 4, 4, and 3 items. Similarly, we created 3 parcels for the hostility items. Parceling reduces random errors and increases the reliability of the structural model, and hence is considered an acceptable procedure when conducting SEM with latent variable with multiple indicators (Little, Cunningham, Shahar, & Widaman, 2002). The model showed good fit to the data ($\chi^2_{(47)} = 331.99$, $p < .001$, RMSEA = 0.03 (LLCI = .027 ULCI = .033), CFI = .98, TLI = .98).

As a second step, we tested an autoregressive model of hostility and loneliness. We added the control variables (age, gender and education) as time invariants, and marital status as time variant. We then specified them to affect both occurrences of the latent variables. Depressive symptoms, ADL, social contact and neuroticism were specified as correlates, because the relationship between these and the variables of interest could be bidirectional. Following modification indices, we allowed for the following correlations: both occurrences of marital status; gender with marital status, social contact and depressive symptoms; depressive symptoms with social contact, education, marital status and ADL; ADL with age and neuroticism. The model showed good fit to the data ($\chi^2_{(139)} = 2431.08$, $p < .001$, RMSEA = 0.047 (CI = 0.045, 0.049), CFI = .91, TLI = .88).

Results of the cross-lagged model suggest that loneliness at T1 is a significant predictor of hostility ($B = .12$, $SE = .02$, $p < .001$) at T2. Similarly, Hostility also predicts loneliness ($B = .09$, $SE = .02$, $p < .001$). The autoregressive effects are $B = .60$, $SE = .02$, $p < .001$ for hostility, and $B = .65$, $SE = .02$, $p < .001$ for loneliness (see Figure 1). R-Squared estimates are .49 for T2 loneliness, and .47 for T2 hostility.

To examine whether the two paths (from T1 loneliness to T2 hostility, and from T1 hostility to T2 loneliness) are significantly

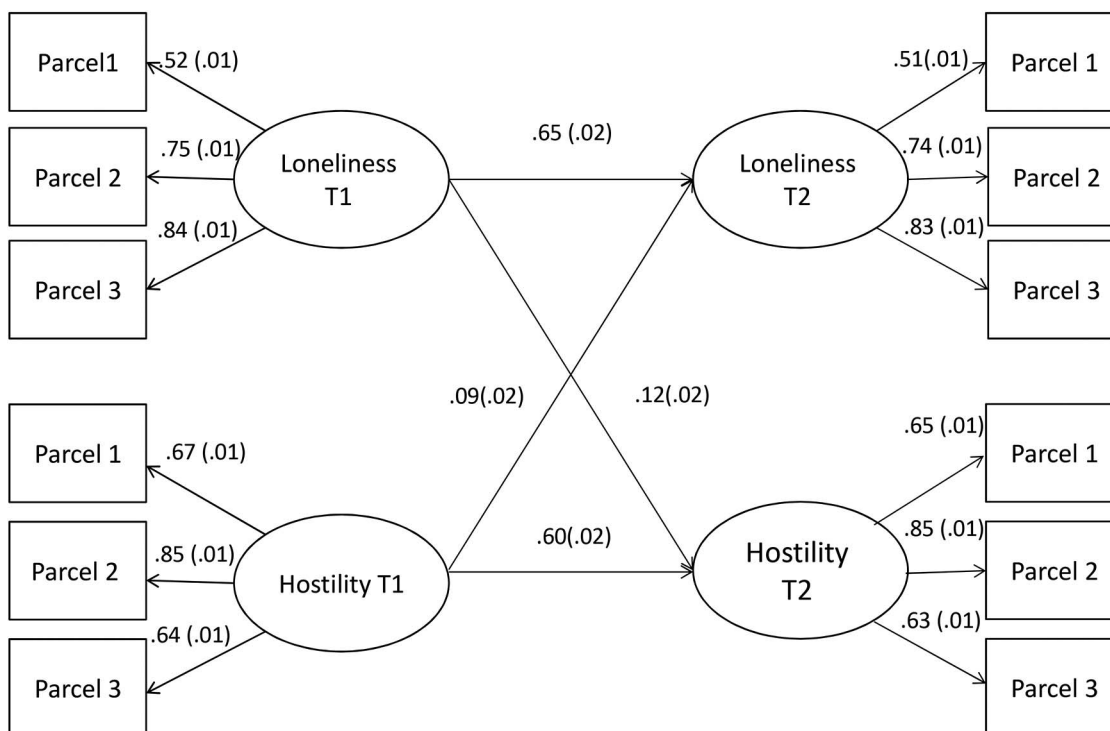


Figure 1. A cross-lagged model of loneliness and hostility. All estimates are significant ($p < .001$).

different, we constrained the paths, forcing them to be equal. The restricted model ($\chi^2_{(140)} = 2430.77, p < .001$) did not fit the data significantly better based on Satorra-Bentler scaled chi-square difference test ($\chi^2_{(1)} = 1.11, p = ns$), suggesting that the effects are similar.

Discussion

This study explored the temporal associations between loneliness and hostility. Our findings suggest that loneliness is a significant predictor of hostility. This is in line with Cacioppo's conceptualization of loneliness as a state that promotes hypervigilance, that could cause individuals to respond with avoidance and deterrence toward others. It is also in line with the findings of Rokach and Brock (1998), suggesting that individuals use avoidance and distancing coping strategies when facing loneliness.

Hostility is a social-cognitive schema, according to which people cannot be trusted. It is possible that in lonely individuals this cognitive schema gains accessibility, and acts to defend one's ego by decreasing others' worthiness as possible relationship partners. Thus, loneliness is not one's deficiency in gaining intimacy; it is others' wrongdoing that is "to blame" for the lack of perceived intimacy. It is a possible way to "brush off" some of the vulnerability that the need of others elicits.

Another way to interpret this result draws on the findings of Rokach and Brock (1998), suggesting that the pain and vulnerability that loneliness elicits is so devastating that individuals feel they need more "personal space" to recuperate. Hostility, in this regard, could be a cognitive mechanism that "permits" one to distance himself or herself from others. It should be noted that according to the evolutionary perspective, hostility resulting from

loneliness is dysfunctional. Loneliness is a painful experience that should encourage reaffiliation, and not result in distancing the self from others (Cacioppo, Cacioppo, & Boomsma, 2014). The dysfunctionality of hostility is also evident in the fact that, according to our findings, hostility leads to loneliness.

Those highly hostile individuals might feel that they are unable to trust others, despite their desire for intimacy. Moreover, hostility can (and is) perceived by others (Haney et al., 1996), even when it is not verbally communicated, and results in decreased social attractiveness of the hostile individual (Nowicki & Oxenford, 1989). Thus, hostile individuals might deter others, decreasing other's responsiveness to their intimacy seeking attempts.

In older adulthood, both loneliness and hostility may be especially devastating, given their potentially heightened presence and the fact that both were found to relate to decreased physical and mental health (Cacioppo et al., 2006; Smith et al., 2004). According to the socioemotional selectivity theory (Carstensen et al., 1999), intimate relationships gain importance in older adulthood. Hence the perception that one is unable to fulfill his or her social needs because others are perceived as either untrustworthy or unavailable could be particularly debilitating. Moreover, individuals' ability to age successfully is defined, in part, by their ability to remain socially engaged (Rowe & Kahn, 1997). Loneliness and hostility might incrementally increase creating a downward spiral of decreasing social resources, resulting in a sense of alienation, marginality and disengagement that harm individuals' ability to experience successful aging.

Despite its strengths that include a large and longitudinal dataset, this study suffers from a number of limitations. First, as data

on hostility were only available for two waves of the HRS, we could not test whether there is a longitudinal spiral between hostility and loneliness. Second, it is possible that a third factor, such as attachment orientation, social skills or behavioral aspects—such as conflict-management is responsible for the effects found. Those individuals with poor social skills tend to have self-defeating perceptions of their social interactions and social counterparts, leading them to both experience difficulties in securing social contact, and to interpret others' behavior as hostile (Check, Perlman, & Malamuth, 1985; Jones, Freemon, & Goswick, 1981; Weiss, 1973). However, these explanations do not deem this study's findings unimportant, as a very large body of research focuses on loneliness and hostility as constructs worthy of examination on their own (see, e.g., Hawkley & Cacioppo, 2010). Future research could focus on uncovering the mechanisms that moderate the loneliness-hostility relationship, exploring when loneliness leads to hostility, and when other reactions, such as sadness, are more prominent. Finally, our sample was relatively old, and despite the importance of studying these constructs in older adults, future research could examine the model on younger samples, or test whether the effects found vary between age groups. Both hostility and loneliness seem to increase from middle to older adulthood, but the nature of their association might differ between the age groups due to different motivations for reaffiliation. For example, in older adulthood the desire for intimate relationships might be more pronounced, whereas in younger adulthood individuals may prefer larger, instrumentally rewarding social networks (Carstensen et al., 1999). Although adolescents suffer from high levels of loneliness, we could not find any studies examining loneliness and hostility in this age group. Future research could benefit from taking a life span perspective on this issue, exploring loneliness and hostility from adolescence to older adulthood.

Despite these limitations, this research offers several theoretical and practical implications. Theoretically, it adds to the limited knowledge we have about the reciprocal effects of loneliness and hostility. Despite the common underlying perception of aloneness that connects hostility and loneliness, and despite theoretical foundations to these associations suggested by Cacioppo and Hawkley (2005, 2009), Cacioppo, Hawkley, and Thisted (2010), no thorough empirical studies have been conducted. Practically, understanding the hostility-loneliness link could direct mental health professionals to treat hostility as a possible consequence of loneliness, and loneliness as a result of hostility. The present study stresses the importance of loneliness in determining older adults' cynical hostility, for example, the tendency to perceive others as harmful, and the harmful social effects of cynical hostility as manifested in loneliness. Possibly, incorporating interventions that address loneliness in the treatment of hostility will result in improved outcomes, and in a similar way, treating hostility might result in reaffiliation and reduced loneliness.

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