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[-] **Abstract and Keywords**

Given that the motivation to affiliate with others is one of the most fundamental and important motivations, humans have developed a variety of strategies to cope with lack of affiliation following experiences of social exclusion. One strategy is anthropomorphism, whereby people create social connection by treating nonhumans as human-like agents capable of social support. This chapter reviews evidence that social exclusion increases the tendencies to anthropomorphize and to seek social connection with nonhumans. It also addresses three questions that follow from people's tendency to anthropomorphize as a means to attain social connection: (1) Is social connection with nonhumans effective? (2) Does connection with nonhumans diminish interest in connections with humans? (3) Could increases in social connection in fact increase dehumanization of other people? In attempting to answer these questions, this chapter provides avenues for future research on the relationship between social connection and seeing human.

Keywords: agency, anthropomorphism, dehumanization, mind perception, motivation, social exclusion

Introduction

Imagination is undoubtedly one of humans' most valuable capacities. It enables a hungry person to conjure up the taste and scent of a delicious filet mignon, a bored child to envision a majestic fortress in a stack of couch cushions, or a frigid ice fisherman to visualize, and perhaps even feel, the warmth of a tropical island. Just as humans use their powers of imagination in attempts to remedy problems like hunger, boredom, and cold, so too do they use these powers to try to solve the problem of social exclusion. People are adept at creating social connection in nonhuman agents ranging from spiritual deities like God and the souls of ancestors, to technological gadgets like one's laptop or car, to one's pet dog or parakeet, to natural entities like trees and lakes.

This process of social substitution resembles how people fulfill other psychological motives through compensatory means. For example, people need to feel good about themselves, and if their sense of integrity is threatened in a personally important domain (e.g., academic performance), they may restore their self-worth by affirming themselves in another personal domain (e.g., athletic performance; Steele, 1988). Similarly, people need to feel in control of their environment. When people experience a loss of personal control, they may attempt to regain a sense of mastery by seeking and upholding sources of external control like God, or the government (Kay, Gaucher, Napier, Callan, & Laurin, 2008). This compensatory means of attaining control operates similarly for people's motivation to attain existential meaning. When confronted with the psychological terror of death, people resolve this existential angst by striving for symbolic immortality or by bolstering (p. 252) their cultural worldview (Pyszczynski, Greenberg, & Solomon, 1999).

The flexibility and creativity that people display in attempts to satiate motivations for self-worth, control, and

existential meaning, also emerges in their attempts to satisfy their desire for affiliation with others. When complete connection with others is lacking, people will seek pieces of social information and show a greater willingness to engage in social opportunities. For example, when people feel socially excluded, they will attend to the social and emotional cues of others (DeWall, Maner, & Rouby, 2009; Pickett, Gardner, & Knowles, 2004), express greater desire to work with others (Maner, DeWall, Baumeister, & Schaller, 2007; Williams & Sommer, 1997), and focus on symbolic reminders of loved ones such as mementos and photographs (Gardner, Pickett, & Knowles, 2005). All of these behaviors suggest that social disconnection increases attempts at substituting a novel source of connection for a recently lost one.

Attempts at social substitution extend to nonhumans as well. In the absence of human connection, people try to counteract feelings of social exclusion through anthropomorphism and seeking affiliation with nonhuman agents (Epley, Waytz, & Cacioppo, 2007). God, in particular, is one such agent that people seek when they feel socially disconnected. People high in loneliness or need to belong are more likely to seek a connection with God (Burris, Batson, Alstaedten, & Stephens, 1994; Maio & Gebauer, 2012; Rokach & Brock, 1998), and "singles" compared with people in committed relationships are more likely to perceive personal relationships with God (Granqvist & Hagekkull, 2000). Experimental manipulations of social exclusion similarly increase religiosity (Aydin, Fischer, & Frey, 2010). In addition, people coping with the death of a close other often show an increase in spiritual belief (e.g., Glick, Weiss, Parks, 1974; McIntosh, Silver, & Wortman, 1993; Spilka, Hood, Gorsuch, 1985; Wuthnow, Christiano, Kuzlowski, 1980). These findings suggest that social deprivation—in this case the actual loss of a social affiliate—increases the pursuit of nonhuman sources of social affiliation. Of course, spiritual agents serve additional psychological functions such as providing control and meaning, but their capacity for social support likely also motivates people to turn to them after a social loss.

Like people who experience loneliness or the loss of a loved one, people with insecure interpersonal attachment styles who fear rejection and crave acceptance are particularly likely to form attachments with God compared with people who feel securely attached to their partners (Kirkpatrick & Shaver, 1990; Kirkpatrick, 1997, 1998). People who report an insecure attachment style in their interpersonal relationships also are more likely than securely attached people to report seeking and forming bonds with parasocial characters (Cole & Leets, 1999), fictional or real people who appear on television (see chapter 26, this volume). In another set of studies, people's self-reported loneliness correlated with the tendency to talk to themselves and to seek social support from watching television (Jonason, Webster, & Lindsey, 2008). Finally, loneliness correlates with the tendency to describe one's pets in terms of mental and socially supportive traits (Epley, Waytz, Akalis, Cacioppo, 2008) or to attribute mental states to technological gadgets (Epley, Akalis, Waytz, & Cacioppo, 2008) and to celestial bodies (Waytz, Cacioppo, Epley, 2007).

Experimental studies also demonstrate socially excluded people's proclivity to create social connection with nonhuman agents (Epley, Akalis et al., 2008). In one experiment, people who were led to anticipate a bleak social future marred by frequent exclusion and rejection, compared with people who were led to anticipate a future filled with social acceptance, expressed significantly higher belief in supernatural agents. Anticipating rejection from humans increased the tendency to affirm the existence of nonhuman supernatural agents.

In a second experiment, participants watched one of three separate video clips designed to induce different emotional experiences—fear, loneliness, or neutral feelings. Following this manipulation, participants again rated their belief in various supernatural agents and also selected three traits that best described a pet that they owned or one they knew well. People made to feel lonely reported significantly higher belief in supernatural agents than participants in the other two conditions *and* were more likely to describe their pets in mental and socially supportive traits (e.g. considerate, thoughtful, sympathetic) versus traits that were purely behavioral (e.g. active, lethargic) or traits that were mental, but not necessarily supportive (e.g. devious, creative). These results further suggest that the experience of social exclusion causes individual to seek connection with nonhuman agents through anthropomorphism. Given that this tendency was more pronounced for participants who experienced loneliness versus participants who experienced fear, these findings also suggest that social disconnection in particular, and not merely negative emotion, increases anthropomorphism.

Cross-sectional and experimental designs demonstrate that the experience of chronic loneliness, (p. 253) the experience of social loss in real life, or experimental manipulations of loneliness increase the tendency to humanize and pursue connection with nonhuman agents, exemplifying a demonstrable link between social

exclusion and anthropomorphism. In doing so, this research also raises three interrelated questions: (Q1) Is anthropomorphism effective in satiating the motivation for social connection? (Q2) Does forming connections with nonhumans diminish people's desire to affiliate with humans? (Q3) Do increases in social connection—either with humans or nonhumans—increase dehumanization (just as decreases in social connection increase humanization)? What follows are attempts to provide answers to these questions.

Q1: Is Anthropomorphism Effective in Satiating the Motivation for Social Connection?

Harry Harlow (1958) famously demonstrated that infant monkeys who were isolated from their mothers were capable of forming connections surrogate "mothers" made from terrycloth and wires, clinging to these surrogates when frightened or distressed, and seeking comfort from them. Although the monkeys raised with surrogate mothers did not fare as well as monkeys raised with real mothers, monkeys raised with the terrycloth mothers grew up healthier and more well-adjusted than did monkeys raised without any source of affiliation. These findings suggest that social substitutes can provide some degree of meaningful affiliation. How much social substitution is effective for humans, and the degree to which anthropomorphism can satiate social connection still remains a matter of some debate.

Indeed a number of studies demonstrate that connection with a real, live, human being may not be the only way to achieve social connection. Indeed, recalling a positive social experience or experiencing nostalgia reduces loneliness and counteracts some of the consequences of social exclusion (Twenge, Zhang, Catanese, Dolan-Pascoe, Lyche, & Baumeister, 2007; Zhou, Sedikides, Wildschut, & Gao, 2008), suggesting that conjuring up the image of another person may be sufficient. In the realm of nonhuman connection, one set of studies demonstrated that turning to favored television programs buffered people against the threats of social rejection and reduced people's feelings of loneliness (Derrick, Gabriel, & Hugenberg, 2009). Other studies have shown that maintaining a pet as a human-like companion confers a variety of health and psychological benefits from improved cardiovascular functioning to decreased anxiety (see McConnell, Brown, Shoda, Stayton, & Martin, 2011; Serpell, 2003). One study showed that animal assisted therapy for elderly residents of a nursing home also reduced loneliness (Banks & Banks, 2002). Another recent study with an elderly population found that providing seniors with an anthropomorphic robot dog even offered the same benefits to psychological well-being that an actual dog did (Banks, Willoughby, & Banks, 2008). Nursing home residents who interacted with a robotic seal called Paro, designed to provide companionship, also showed more positive mood and diminished stress (Wada, Shibata, Saito, & Tanie, 2004). Forming a relationship with God may benefit well-being as well. People who construe God as a partner or collaborator cope with stress and illness better than do people who do not construe God as a partner or collaborator (Pargament, 1997).

What remains unclear, however, is whether a relationship with a nonhuman entity is as socially satisfying as a relationship with another person. Nonhuman agents such as computers and avatars compare to real humans in their capacities for persuasion, ostracism, and social influence (Bailenson & Yee, 2005; Nass & Moon, 2000; Zadro, Williams, & Richardson, 2004), but it remains unknown whether they can provide social connection. Although connection with a nonhuman is better than no connection at all, there is no substitute for other people. Psychologist and loneliness expert, John Cacioppo, has noted that engaging in computer-mediated relationships to satisfy social connection is "like starving people eating celery. It's better than nothing, but there's no long-term sustenance" (Goldman, 2010). Indeed, one recent study showed an association between Internet use and increased loneliness (Stepanikova, Nie, & He, 2010).

Numerous factors likely moderate the effectiveness of nonhuman connections for satiating social needs. People's ability and willingness to anthropomorphize, for example, should influence how much nonhumans appear capable of support. For example, pets might function as satisfactory social companions for animal-lovers, but not for people who dislike animals and do not treat them as human-like. God may also boost feelings of connection for religious believers, but the presence of this spiritual agent likely does not affect atheists, who rarely consider the presence of a human-like God. In addition, nonhuman entities that more easily lend themselves to anthropomorphism are more likely to provide social connection. Compared to slugs, cats and dogs are far more morphologically similar to humans, are (p. 254) more readily anthropomorphizeable, and are likely to serve as better social companions. Future research may test how much these factors influence the effectiveness of anthropomorphism as satisfying means to attain social connection.

Q2: Does Affiliation with Nonhumans Diminish the Desire to Affiliate with Humans?

A second question that arises from people's tendency to anthropomorphize as a means to find social connection is whether people may come to *prefer* connection with nonhumans compared to humans. Because nonhuman entities such as pets are less evaluative and judgmental than humans, people may view them as favorable companions. One study demonstrated that when performing a difficult task, pet owners experienced less threat and reduced cardiovascular activity when accompanied by their pets than in the presence of their spouses (Allen, Blascovich, & Mendes, 2002). Following prolonged experiences of social exclusion, people may in fact find that connection with nonhumans is easier than connection with humans regardless of the actual benefits for physical and mental well-being. In support of this idea, people low in trust of others preferred simulated activities—interacting with media (watching a television show, seeing a movie, using the Internet)—compared with real social activities such as hanging out with friends (Green & Brock, 1998). A similar set of studies demonstrated that people felt simulated activities compared to real activities are less costly in terms of risks for rejection (Green & Brock, 2008). People particularly susceptible to rejection or people who are particularly distrustful of others may prefer the company of nonevaluative nonhuman agents compared with human ones. This is a question that awaits future research.

Q3: Do Increases in Social Connection Increase Dehumanization?

The need for social connection is similar to a fundamental drive state like thirst or hunger (Baumeister & Leary, 1995), and people can satiate sociality motivation like they can quench their thirst or satisfy their hunger. Increased feelings of intimacy in close relationships or belongingness in a group decreases the motivation to pursue new connections with others (Brewer, 1991 Reis, 1990). Being made to feel socially accepted also reduces performance on tasks related to forming new relationships (DeWall, Baumeister, & Vohs, 2008), suggesting that people become relatively less inclined to seek social connection when this motivation is sated. Consistent with this reasoning, evolutionary theory suggests that there is a limited number of social relationships that people can maintain (Dunbar, 1992) and that when one reaches this limit, both the capacity and thus the desire to form new connections weakens. Considering others' interests, attitudes, feelings, and preferences are critical for connecting with them. Diminishing the motivation to connect with others may diminish the motivation to recognize, think about, or consider others' mental states as well.

Some evidence supports the idea that social connection increases dehumanization. First, the clearest examples of dehumanization arise in intergroup settings in which in-group members dehumanize out-group members (Goff, Eberhardt, Williams, & Jackson, 2006; Leyens et al., 2003). Second, research has identified other features of the collective that increase antisocial behavior, providing support for philosopher Reinhold Niebuhr's (1934, p. 35) observation that "the proportion of reason to impulse becomes increasingly negative when we proceed from the life of individuals to that of social groups." The sense of deindividuation one feels when surrounded by others can increase aggression (Zimbardo, 1969). The diffusion of responsibility that increases in the presence of a group likewise diminishes sensitivity to the suffering of others (Bandura, Underwood, & Fromson, 1975; Darley & Latané, 1968). Groups that are especially cohesive and homogeneous in nature tend to prevent people from expressing dissenting opinions in favor endorsing immoral action that they would not endorse in private (Janis, 1972). Third, many of history's most severe acts of violence have been committed by the most highly affiliated groups (Cohen, Montoya, & Insko, 2006), with evidence that in-group altruism and out-group hostility evolved jointly (Choi & Bowles, 2007).

My colleagues and I have also begun directly testing the hypothesis that social connection increases dehumanization (Waytz & Epley, 2012). In a series of studies, we manipulated social connection by having people write about someone with whom they feel closely connected (versus a stranger) or completing the study materials in the room with a close friend (versus a stranger). People who wrote about someone close to them or who completed the study in the company of a friend (compared to participants in comparable control groups) denied more basic mental states (e.g. pain, complex thought) and expressed more willingness to describe others as unfeeling savages. In one study, the experience of social connection increased participants' (p. 255) endorsement of harm toward a dehumanized group—terrorists responsible for the September 11, 2001 attacks on the United States. These findings suggest that although social connection is undoubtedly beneficial for one's *own* physical and mental well-being, social connection may have negative consequences for people outside one's immediate social circle.

Conclusions

The relationship between social connection and anthropomorphism suggests that social connection and the tendency to *see human* are inversely related. This relationship provides insight to how people attempt to solve the problem of social exclusion, and also speaks to the profundity of the need to belong. In the absence of actual human connection, people will attempt to make do with just about anything as a social substitute.

As technology advances, the possibilities for the development of sophisticated nonhuman social substitutes will be limitless. Already devices exist such as the "boyfriend pillow" (a pillow in the shape of a man's arm providing a hug) or "Huggy Pajamas" (pajamas that enable an individual to "send" a hug to another person from a remote distance by hugging an interface). Personalized humanoid robots that operate in service of providing social support are developing rapidly as well, and now hold capacities for social interaction, emotional responsiveness, and even sex. Such advancements speak to the power of human imagination and ingenuity in attempts to remedy the problem of social exclusion. However, future research will determine how effective anthropomorphism is as a solution to the problem of social exclusion, and whether there can ever be anything as good as the real thing.

References

Allen, K. M., Blascovich, J., & Mendes, W. B. (2002) Cardiovascular reactivity and the presence of pets, friends, and spouses: the truth about cats and dogs. Psychosomatic Medicine, 64, 727–739.

Aydin, N., Fischer, P., & Frey, D. (2010). Turning to God in the face of ostracism: Effects of social exclusion on religiousness. Personality and Social Psychology Bulletin, 36, 742–753.

Bailenson, J. N., & Yee, N. (2005). Digital Chameleons: Automatic assimilation of nonverbal gestures in immersive virtual environments. Psychological Science, 16, 814–819.

Bandura, A., Underwood, B., & Fromson, M. E. (1975). Disinhibition of aggression through diffusion of responsibility and dehumanization of victims. Journal of Research in Personality, 9, 253–269.

Banks, M. R., and Banks, W. A. (2002). The effects of animal-assisted therapy on loneliness in an elderly population in long-term care facilities. The Journals of Gerontology Series A: Biological Sciences and Medical Sciences, 57, 428–432.

Banks, M. R., Willoughby, L. M., & Banks, W. A. (2008). Animal–assisted therapy and loneliness in nursing homes: Use of robotic versus living dogs. Journal of the American Medical Directors Association, 9, 173–177.

Baumeister, R.F., & Leary, M.R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. Psychological Bulletin, 117, 497–529.

Brewer, M. B., (1991). The social self: On being the same and different at the same time. Personality and Social Psychology Bulletin, 17, 475–482.

Burris, C. T., Batson, C. D., Altstaedten, M., & Stephens, S. K. (1994). What a friend: Loneliness as a motivator of intrinsic religion. Journal for the Scientific Study of Religion, 33, 326–334.

Choi J-K., & Bowles, S. (2007). The coevolution of parochial altruism and war. Science, 318, 636–640

Cohen, T. R., Montoya, R. M., & Insko, C. A. (2006). Group morality and intergroup relations: Cross-cultural and experimental evidence. Personality and Social Psychology Bulletin, 32, 1559–1572.

Cole, T., & Leets, L. (1999). Attachment styles and intimate television viewing. Insecurely forming relationships in a parasocial way. Journal of Social and Personal Relationships, 16, 495–511.

Darley, J. M., & Latané B. (1968). Bystander intervention in emergencies: Diffusion of responsibility. Journal of Personality and Social Psychology, 8, 377–383.

Derrick, J. L., Gabriel, S., & Hugenberg, K. J. (2009). Social surrogacy: How favored television programs provide the experience of belonging. Journal of Experimental Social Psychology, 45, 352–362.

DeWall, C. N., Baumeister, R. F., & Vohs, K. D. (2008). Satiated with belongingness? Effects of acceptance, rejection, and task framing on self-regulatory performance. Journal of Personality and Social Psychology, 95, 1367–1382.

DeWall, C. N., Maner, J. K., & Rouby, D. A. (2009). Social exclusion and early-stage interpersonal perception: Selective attention to signs of acceptance. Journal of Personality and Social Psychology, 96, 729–741.

Dunbar, R. (1992). Coevolution of neocortex size, group size and language in humans. Behavioral and Brain Sciences, 16, 681–735.

Epley, N., Akalis, S., Waytz, A., & Cacioppo, J. T. (2008). Creating social connection through inferential reproduction: Loneliness and perceived agency in gadgets, gods, and greyhounds. Psychological Science, 19, 114–120.

Epley, N., Waytz, A., Akalis, S., & Cacioppo, J. T. (2008). When I need a human: Motivational determinants of anthropomorphism. Social Cognition, 26, 143–155.

Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: A three–factor theory of anthropomorphism. Psychological Review, 114, 864–886.

Gardner, W.L., & Pickett C.L., & Knowles, M.L. (2005). Social "snacking" and social "shielding": The satisfaction of belonging needs through the use of social symbols and the social self. In K. Williams, J. Forgas, and W. von Hippel (Eds.), The Social Outcast: Ostracism, Social Exclusion, Rejection, and Bullying (pp. 227–242). New York: Psychology Press.

Glick, I. D., Weiss, R. S., & Parkes, C. M. (1974). The First Year of Bereavement. New York: John Wiley. (p. 256)

Goff, P. A., Eberhardt, J. L., Williams, M., & Jackson, M. C. (2008). Not yet human: Implicit knowledge, historical dehumanization, and contemporary consequences. Journal of Personality and Social Psychology, 94, 292–306.

Goldman, A. (2010). Look at all the lonely people [Electronic version]. Las Vegas Weekly. Retrieved March 31, 2010, from **http://www.lasvegasweekly.com/news/2010/mar/04/look-all-lonely-people/**

Granqvist, P., & Hagekull, B. (2000). Religiosity, adult attachment, and why "singles" are more religious. International Journal for the Psychology of Religion, 10, 111–123.

Green, M. C., & Brock, T. C. (1998). Trust, mood, and outcomes of friendship predict preferences for real versus ersatz social capital. Political Psychology, 19, 527–544.

Green, M. C., and Brock T. C. (2008). Antecedents and civic consequences of choosing real versus ersatz social activities. Media Psychology, 11, 5676–592.

Harlow, H. (1958). The nature of love. American Psychologist, 13, 573–685.

Janis, I. (1972). Victims of Groupthink. Boston, MA: Houghton-Mifflin.

Jonason, P. K., Webster, G. D., & Lindsey. A. E. (2008). Solutions to the problem of diminished social interaction. Evolutionary Psychology, 6, 637–651.

Kay, A. C., Gaucher, D., Napier, J. L., Callan, M. J., & Laurin, K. (2008). God and the Government: Testing a compensatory control mechanism for the support of external systems. Journal of Personality and Social Psychology, 95, 18–35.

Kirkpatrick, L. A. (1997). A longitudinal study of changes in religious belief and behavior as a function of individual differences in adult attachment style. Journal for the Scientific Study of Religion, 36, 207–217.

Kirkpatrick, L. A. (1998). God as a substitute attachment figure: A longitudinal study of adult attachment style and religious change in college students. Personality and Social Psychology Bulletin, 24 (9), 961–973.

Kirkpatrick, L. A., & Shaver, P. R. (1990). Attachment theory and religion: Childhood attachments, religious beliefs,

and conversion. Journal for the Scientific Study of Religion, 29 (3), 315–334.

Knowles, M. (2013). Belonging regulation through the use of (para)social surrogates. In C. N. Dewall (Ed.), *The Oxford Handbook of Social Exclusion*. New York: Oxford University Press.

Leyens, J. Ph., Cortes, B. P., Demoulin, S., Dovidio, J. F., Fiske, S. T., Gaunt, R., et al., (2003). Emotional prejudice, essentialism, and nationalism. European Journal of Social Psychology, 33, 704–717.

Gebauer, J. E., & Maio, G. R. (2012). The need to belong can motivate belief in God. Journal of Personality, 80, 465–501.

Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the "porcupine problem." Journal of Personality and Social Psychology, 92, 42–55.

McConnell, A. R., Brown, C. M., Shoda, T. M., Stayton, L. E., & Martin, C. E. (2011) Friends with benefits: On the positive consequences of pet ownership. Journal of Personality and Social Psychology, 101, 1239–1252.

McIntosh, D. N., Silver, R. C., & Wortman, C. B. (1993). Religion's role in adjustment to a negative life event: Coping with the loss of a child. Journal of Personality & Social Psychology, 65, 812–821.

Nass, C., & Moon, Y. (2000). Machines and mindlessness: Social responses to computers. Journal of Social Issues, 56, 81–103.

Niebuhr, R. (1934). *Moral Man and Immoral Society*. New York: Charles Scribner's Sons.

Pargament, K. (1997). *The Psychology of Religious Coping.* New York: Guilford.

Pickett, C. L., Gardner, W. L., & Knowles, M. (2004). Getting a cue: The need to belong and enhanced sensitivity to social cues. Personality and Social Psychology Bulletin, 30, 1095–1107.

Pyszczynski, T. ; Greenberg, J., & Solomon, S. (1999). A dual process model of defense against conscious and unconscious death-related thoughts: An extension of terror management theory. Psychological Review, 106, 835–845.

Reis, H. T. (1990). The role of intimacy in interpersonal relationships. Journal of Social and Clinical Psychology, 9, 15–30.

Rokach, A., & Brock, H. (1998). Coping with loneliness. Journal of Psychology: Interdisciplinary and Applied, 192 (1), 107–127.

Serpell, J. A. (2003). Anthropomorphism and anthropomorphic selection—beyond the "cute response." Society & Animals, 11, 83–100.

Spilka, B., Hood, R., and Gorsuch, R. (1985). *The psychology of Religion: An Empirical Approach.* Englewood Cliffs, NJ: Prentice-Hall.

Steele, C.M. (1988). The psychology of self affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology, 21, 261–301.

Stepanikova, I., Nie, N., & He, X. (2010). Time on the Internet at home, loneliness, and life satisfaction: Evidence from panel time-diary data. Computers in Human Behavior, 26, 329–338.

Twenge, J. M., Zhang, L., Catanese, K. R., Dolan-Pascoe, B., Lyche, L. F., & Baumeister, R. F. (2007). Replenishing connectedness: Reminders of social activity reduce aggression after social exclusion. British Journal of Social Psychology, 46, 205–224.

Wada, K., Shibata, T., Saito, T., & Tanie, K. (2004). Effects of robot assisted activity for elderly people and nurses at a day service center. Proceedings of the IEEE, 92, 1780–1788.

Waytz, A., Cacioppo, J. T., & Epley, N. (2007). [Loneliness and anthropomorphism]. Unpublished raw data.

Waytz, A., & Epley, N. (2012). Social connection enables dehumanization. Journal of Experimental Social Psychology, 48, 70–76.

Williams, K.D, & Sommer, K.L. (1997). Social ostracism by coworkers: Does rejection lead to loafing or compensation? Personality and Social Psychology Bulletin, 23, 693–706.

Wuthnow, R., Christiano, K., and Kuzlowski, J. (1980). Religion and bereavement. A conceptual framework. Journal for the Scientific Study of Religion, 19, 408–430.

Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer lowers belonging, control, self-esteem, and meaningful existence. Journal of Experimental Social Psychology, 40, 560–567.

Zhou, X., Sedikides, C., Wildschut, T., & Gao D-G. (2008). Counteracting loneliness: On the restorative function of nostalgia. Psychological Science, 19, 1023–1029.

Zimbardo, P. G. (1969). The human choice: Individuation, reason, and order vs. deindividuation, impulse and chaos. In W. J. Arnold & D. Levine (Eds.), Nebraska Symposium on Motivation (Vol. 17, pp. 237–307). Lincoln, NE: University of Nebraska Press.

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