*Research Article*

# Creating Social Connection Through Inferential Reproduction

## Loneliness and Perceived Agency in Gadgets, Gods, and Greyhounds

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**ABSTRACT**—***People are motivated to maintain social connection with others, and those who lack social connection with other humans may try to compensate by creating a sense of human connection with nonhuman agents. This may occur in at least two ways—by anthropomorphizing nonhuman agents such as nonhuman animals and gadgets to make them appear more humanlike and by increasing belief in commonly anthropomorphized religious agents (such as God). Three studies support these hypotheses both among individuals who are chronically lonely (Study 1) and among those who are induced to feel lonely (Studies 2 and 3). Additional findings suggest that such results are not simply produced by any negative affective state (Study 3). These results have important implications not only for understanding when people are likely to treat nonhuman agents as humanlike (anthropomorphism), but also for understanding when people treat human agents as nonhuman (dehumanization).***

Few people are strangers to the dream of owning a secluded island where they can live in supreme isolation, away from the crush of humanity that surrounds modern urbanites. The experience of those who approximate this dream, however, suggests that it may be more of a nightmare. Even moderate levels of isolation from other people can increase the incidence of clinical depression and suicide ideation (Heinrich & Gullone, 2006), elevate blood pressure levels (Hawkley, Masi, Berry, & Cacioppo, 2006), increase levels of stress hormones (Adam, Hawkley, Kudielka, & Cacioppo, 2006), and compromise one's immune system (Cacioppo, Hawkley, & Berntson, 2003). Taken together, these health risks make chronic isolation at least as large a risk factor for morbidity and mortality as cigarette smoking (House, Landis, & Umberson, 1988). Satisfying social relations with others is the one demonstrable factor that systematically differentiates very happy people from unhappy people (Diener & Seligman, 2002), and most people who find themselves isolated from others fairly quickly begin wanting a bit more urban crush and a little less desert island.

People engage in a variety of behaviors to alleviate the pain of social disconnection. For example, they actively seek connections with other people (Maner, DeWall, Baumeister, & Schaller, 2007), imagine important social relationships (Twenge, Catanese, & Baumeister, 2003), and increase attention to social cues in the environment (Gardner, Pickett, Jeffries, & Knowles, 2005). Such behaviors involve attempts to establish connections with other existing humans, but we suggest that disconnected people may adopt an even more creative approach by inventing humanlike agents in their environment to serve as potential sources of connection. People may do so in at least two distinct ways: by anthropomorphizing nonhuman agents such as mechanical devices and nonhuman animals to make them appear more humanlike or by increasing belief in the existence of commonly anthropomorphized religious agents (such as God; Guthrie, 1993). This creation of humanlike agents is likely to arise through the increased attention to social cues activated by social disconnection or through the active search for potential sources of connection.

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Some existing evidence is consistent with our prediction. Case studies of people undergoing extreme isolation suggest that they fairly quickly begin holding conversations with imagined people, religious deities, or animals (e.g., God; Kirkpatrick, Shillito, & Kellas, 1999). Chronic isolation has been a long-standing explanation for classic examples of anthropomorphism—from seeing mermaids in the ocean to naming geological features by their humanlike features (e.g., Loukatos, 1976). Recent survey evidence suggests that people feel more connected to their god when praying alone than when praying in a group (Adler, 2005), that people who are not in a committed relationship are more likely than those who are to report having a personal relationship with God (Granqvist & Hagekull, 2000), and that people with insecure and anxious attachments to others are likely to hold the strongest religious beliefs (Kirkpatrick & Shaver, 1990). Finally, the death of a loved one tends to increase religious beliefs (e.g., McIntosh, Silver, & Wortman, 1993; Wuthnow, Christiano, & Kuzlowski, 1980), a coping strategy that may be facilitated by anthropomorphic conceptions of religious agents (Pargament, 1997).

None of this research, however, empirically tested the hypothesis that chronic or momentary social disconnection will lead people to create humanlike agents in their environment. We conducted such a test in three studies examining people's evaluations of mechanical gadgets, pets, and religious agents. These studies used both experimental manipulations and dispositional measures of social connection. One of the defining features of human agency is the presence of higher-order mental states, and such mental-state attributions therefore served as our critical dependent variable in perceptions of gadgets (Study 1) and pets (Study 3). Because religious agents are notoriously anthropomorphized (see Guthrie, 1993), we simply measured belief in the existence of specific supernatural agents or associated forces (Studies 2 and 3). We predicted that participants who were chronically lonely or momentarily induced to think about loneliness would create agents of social connection by altering the mental states they attributed to nonhuman agents (Studies 1 and 3) or by increasing their belief in supernatural agents (Studies 2 and 3).

## STUDY 1: GADGETS

### Method

Twenty volunteers (14 female, 6 male) completed an on-line survey in which they read descriptions of four technological gadgets: Clocky (a wheeled alarm clock that "runs away" so that you must get up to turn it off), CleverCharger (a battery charger designed to prevent overcharging), Pure Air (an air purifier for people with allergies or respiratory problems), and Pillow Mate (a torso-shaped pillow that can be programmed to give a "hug").

After reading each description, participants completed five anthropomorphic mental-state ratings ($\alpha = .81$): the extent to which the gadget had "a mind of its own," had "intentions," had "free will," had "consciousness," and "experienced emotions." Participants also completed three items unrelated to the creation of a humanlike agent ($\alpha = .71$): the extent to which each device was attractive, efficient, and strong. Finally, participants completed a three-item loneliness scale ($\alpha = .81$; e.g., "How often do you feel isolated from others?" taken from Hughes, Waite, Hawkley, & Cacioppo, 2004).

### Results and Discussion

Gender did not significantly influence any of the analyses and is therefore not discussed further.

To analyze participants' responses, we first created three separate composite measures—one for the anthropomorphic mental-state ratings, one for the nonanthropomorphic ratings, and one for the loneliness scale—by averaging ratings for the individual items within each of these measures.

As predicted, loneliness was significantly correlated with the anthropomorphic mental-state ratings, $r(18) = .53$, $p = .02$, $p_{rep} = .93$, but not significantly correlated with the nonanthropomorphic ratings, $r(18) = .25$, $p = .29$, $p_{rep} = .64$. The anthropomorphic mental-state ratings and the nonanthropomorphic ratings were themselves significantly correlated, $r(18) = .58$, $p = .01$, $p_{rep} = .95$, but the correlation between loneliness and the anthropomorphic mental-state ratings remained significant even after we controlled for the nonanthropomorphic ratings, $r(17) = .49$, $p = .03$, $p_{rep} = .91$.

Although the results of this study are consistent with our prediction, a correlational study using a dispositional measure of social disconnection cannot demonstrate that social disconnection caused the observed results. We therefore adopted an experimental approach in the next two studies in order to manipulate social connection directly.

## STUDY 2: GODS

Philosophers can vaguely note that religion is an opiate for the masses (Marx, 1844/1959), but psychologists need to explain more specifically which pain people might take this drug to alleviate. Belief in religious agents can serve to alleviate several psychological problems (e.g., awareness of one's own mortality; Norenzayan & Hansen, 2006), and we predicted that one of those is the pain of social disconnection (see also Burris, Batson, Altstaedten, & Stephens, 1994; Kirkpatrick et al., 1999). People who are induced to feel disconnected from other humans should therefore report a stronger belief in religious agents than those induced to feel socially connected.

Not all religious agents, of course, are conceptualized as the kind one might willingly seek when in need of social connection. The overwhelming majority of religious systems contain both loving supernatural agents (e.g., God) who perform desirable actions (e.g., miracles) and evil supernatural agents (e.g., Devil) who perform unpleasant actions (e.g., curses). Social discon-

nection could increase belief in some religious agents or actions but not in others. Such a result seems unlikely, however, given the high intercorrelation between belief in one religious agent within a tradition and belief in other agents within that same tradition. Belief in God within a Judeo-Christian tradition, for instance, entails belief in the Devil as well. We measured belief in a variety of religious agents and associated actions in Study 2, however, to examine this issue.

### Method

A pool of potential participants from the University of Chicago completed an on-line survey that included the question, "Do you believe in God?" Ninety-nine of these people (57 female, 42 male)—50 believers who responded "yes" and 49 nonbelievers who responded "no"—were then invited to participate in Study 2 in exchange for $7.

After arriving at the laboratory, participants first completed a computerized version of the 90-item Eysenck Personality Questionnaire (Eysenck & Eysenck, 1976) and were then told that the computer would generate a set of future-life predictions based on their responses. To bolster participants' belief in the accuracy of the predictions, we told them that the personality questionnaire was a measure of extraversion and provided accurate feedback on the 12-item Extraversion subscale.

We then manipulated social connection using a procedure developed by Twenge, Baumeister, Tice, and Stucke (2001). All participants received a paragraph of "future life predictions" ostensibly based on their personality profile. Those in the disconnected condition read statements suggesting that they would be lonely in their lives (e.g., "You're the type who will end up alone later in life"). Those in the connected condition read statements suggesting that they would be socially connected in their lives (e.g., "You're the type who has rewarding relationships throughout life"). Approximately half of the participants within each experimental condition were religious believers, and the other half were nonbelievers.

Participants were then asked to "begin Part 2 of the study," in which they rated the extent to which they believed in ghosts, angels, the Devil, miracles, curses, and God, on scales ranging from 1 (*not at all*) to 10 (*very much*).

### Results and Discussion

Responses to the six supernatural-agent items were highly intercorrelated ($\alpha = .89$). Including the items as a repeated measures factor did not produce a significant interaction in the following analysis ($F < 1$) or alter the significance levels of any overall analyses. We therefore averaged responses to the six items into a single composite measure to ease presentation.

A 2 (religious believer: yes vs. no) × 2 (condition: disconnected vs. connected) analysis of variance (ANOVA) on participants' supernatural belief revealed only two significant main effects. Not surprisingly, participants who reported believing in God before the experiment reported stronger belief in the supernatural agents ($M = 5.81$) than those who reported not believing in God ($M = 2.25$), $F(1, 95) = 126.44$, $p < .001$, $p_{rep} = .99$, $\eta^2 = .57$. More important, those in the disconnected condition also reported stronger belief in supernatural agents ($M = 4.35$) than those in the connected condition ($M = 3.71$), $F(1, 95) = 3.98$, $p < .05$, $p_{rep} = .88$, $\eta^2 = .04$. The interaction was nonsignificant ($F = 0.42$). Social disconnection does not turn atheists into fundamentalists, of course, but it may nudge religious belief in the same direction for believers and nonbelievers alike.

## STUDY 3: GREYHOUNDS

We designed Study 3 to extend this research in three ways. First, we sought to increase generalizability by investigating perceptions of an additional kind of nonhuman agent, namely, pets. We measured whether the likelihood of attributing humanlike mental states or traits to pets would be greater among people induced to feel social disconnection than among people not so induced. We classified mental-state traits as being humanlike on the basis of existing research that identifies metacognition as a critical feature distinguishing traits seen as humanlike from those shared by other living agents (Cortes, Demoulin, Rodriguez, Rodriguez, & Leyens, 2005; Demoulin et al., 2004; Haslam, Bain, Douge, Lee, & Bastian, 2005). Considering pets also allowed us to compare the impact of loneliness on evaluations of humanlike traits directly related to providing social connection or support (e.g., thoughtful, considerate, sympathetic) and evaluations of traits less directly related to social connection or support (e.g., embarrassable, creative). If social disconnection leads people to create humanlike agents in their environment in order to regain social connection or support, then social disconnection should have a greater influence on traits closely related to social connection than on mental or behavioral traits unrelated to social connection. Religious agents provide a poor test of this specificity hypothesis because beliefs in different religious agents are highly intercorrelated, but mental-state attributions should be more independent.

Second, Studies 1 and 2 left open an important ambiguity. People who are disconnected from others feel lonely, but they also feel profoundly negative. This negative emotional state alone—rather than social disconnection per se—may explain the results observed in those studies. We therefore included a very different negative mood state in Study 3—fear of another person—to investigate whether negative affect alone can explain the results observed thus far. We predicted that it cannot, and that participants in the disconnected condition would report greater belief in supernatural agents and evaluate their pet as being more socially supportive compared with participants in the fear and control conditions.

Finally, including a fear condition enabled a third test. In particular, we have suggested that social disconnection leads

people to create humanlike agents out of existing (or ostensibly existing) nonhuman agents—a kind of anthropomorphism (Epley, Waytz, & Cacioppo, 2007). This process is commonly conflated with the superficially related process of *detecting* living agents in one's environment—a process more closely related to animism. People detect images of the Virgin Mary in tree bark, animal forms in clouds, and threatening strangers in the shadows of darkened alleys (Guthrie, 1993). Detecting an agent in the immediate environment requires vigilance and attention, and fear can increase vigilance for specific threatening or fear-inducing agents that may pose a threat (Maner et al., 2007). Fear caused specifically by the potential threat of another person should increase the tendency to detect humanlike agents in one's immediate environment, and we therefore expected that participants in the fear condition would be more likely to detect a humanlike agent in an ambiguous display than would those in the disconnected and control conditions. We tested this prediction by also asking participants to view 20 ambiguous drawings and report what they saw. Of these 20, 10 were drawn to vaguely resemble a human face (see Fig. 1). We predicted that participants in the fear condition would report seeing more faces than those in the disconnected and control conditions. Such a dissociation between social disconnection and fear across measures related to anthropomorphism versus animism would mark an important boundary condition for the influence of sociality motivation in perceptions of humanlike agency.

**Fig. 1.** Examples of ambiguous images used in the face-detection measure of Study 3. The 2 images in the top row are examples of the 10 images drawn to resemble faces, and the 2 images in the bottom row are examples of the 10 images drawn to resemble nothing in particular.

## Method

### *Participants*

Fifty-seven Harvard University undergraduates (44 female, 13 male) participated in Study 3 in exchange for course credit or $6.

### *Procedure*

Participants arrived at the laboratory for an experiment investigating perceptions of "self, others, and pets." Participants learned that they would watch a short video clip and were instructed to experience the thoughts and emotions felt by the protagonist in the clip as best they could by empathizing with him. Participants were then randomly assigned to experimental condition and watched the 3-min clip associated with that condition.

We selected clips that, to our knowledge, best exemplified the psychological states we intended to convey. Participants in the disconnected condition watched a segment from *Cast Away* (Zemeckis & Broyles, 2000) in which the protagonist experiences severe isolation and loneliness while stranded on a deserted island. Those in the fear condition watched a segment from *Silence of the Lambs* (Demme, Harris, & Tally, 1992) in which the main protagonist is chasing a serial killer (see Gross & Levenson, 1995). Those in the control condition watched a clip from *Major League* (Ward, 1989) in which baseball players interact in a crowd of people after a victory. This last clip was a "control" only in that it (a) involved interactions with other people (unlike the other clips) and (b) did not involve either loneliness or fear.

Participants then completed three measures ostensibly as part of an unrelated experiment. First, they rated their belief in the same supernatural agents and actions used in Study 2. Second, they were asked to think of a pet that they either owned or knew well and to pick from a list of 14 traits those 3 that best described this pet (ownership did not influence any of the reported results). The list of traits included 3 anthropomorphic traits related to social connection (thoughtful, considerate, and sympathetic), 4 anthropomorphic traits less related to social connection (embarrassable, creative, devious, and jealous), and 7 nonanthropomorphic traits that are simply behavioral descriptions (aggressive, agile, active, energetic, fearful, lethargic, and muscular). Finally, participants were shown a series of 20 ambiguous figures (see Fig. 1), each on a separate sheet of paper, and asked to write down what they saw in each. The number of faces spontaneously reported served as our key face-detection measure.

## Results and Discussion

We predicted that the three critical measures would show a dissociation across the experimental conditions. Specifically, we expected that participants in the disconnected condition would report greater belief in supernatural agents and have a stronger tendency to attribute humanlike mental states to nonhuman

agents (pets) than participants in the control and fear conditions, but that participants in the fear condition would be more likely to spontaneously report seeing faces in the ambiguous figures than would those in the control and disconnected conditions. Table 1 presents all relevant means and significance levels for simple-effects tests. We present analyses of the individual measures and then the overall analysis across all measures to ease presentation.

*Belief in Supernatural Agents*

As in Study 2, beliefs in the different supernatural agents and actions were highly interrelated ($\alpha = .89$) and therefore collapsed into a composite measure. As predicted, orthogonal planned contrasts showed that participants in the disconnected condition reported stronger belief in supernatural agents than participants in the other two conditions combined, $t(54) = 2.36$, $p = .02$, $p_{rep} = .92$, $d = 0.57$, whereas beliefs in the control and fear conditions did not differ, $p = .77$.

*Pet Ratings*

Participants selected three traits that best described their pet. Our critical measure was the proportion of traits selected from each trait type out of the total number possible for that type. As predicted, orthogonal planned contrasts revealed that participants in the disconnected condition were more likely to select one of the three social-connection traits than were participants in the other two conditions combined, $t(54) = 3.01$, $p < .01$, $p_{rep} = .97$, $d = 0.82$, whereas the likelihood of selecting the social-connection traits did not differ between the fear and control conditions, $p = .40$. There was no difference across conditions in the likelihood of selecting either the nonconnection traits or the behavioral traits, both $p$s $> .15$, and none of the individual nonconnection or behavioral traits was chosen significantly more often in one condition than in the others (all $p$s $> .2$). A 3 (condition: disconnection, fear, control) $\times$ 3 (traits: connection, nonconnection, behavioral) mixed-model ANOVA yielded only the predicted interaction, $F(4, 108) = 3.69$, $p = .01$, $\eta^2 = .12$. These results suggest that individuals lacking social connection may create agents that are useful conduits for social connection.

**TABLE 1**
***Primary Dependent Measures From Study 3***

| Measure | Experimental condition | | |
|---|---|---|---|
| | Disconnected | Control | Fear |
| Belief in supernatural agents | 4.77[a] | 3.42[ab] | 3.20[b] |
| Pet ratings | | | |
| Social-connection traits | .44[a] | .23[b] | .14[b] |
| Nonconnection traits | .08[a] | .11[a] | .13[a] |
| Behavioral traits | .20[a] | .27[a] | .25[a] |
| Face detection | 6.60[a] | 6.56[a] | 8.16[b] |

**Note.** Pet ratings are reported as the average proportion of traits selected out of the total number possible for the indicated category (three social-connection traits, four nonconnection traits, and seven behavioral traits). Face detection was measured as the number of images in which participants reported seeing a face (of the 20 images, 10 were drawn to bear at least some resemblance to faces). Within each row, means that do not share a superscript differ at $p < .05$, two-tailed. For belief in supernatural agents, the post hoc comparison between the disconnected and control conditions was marginally significant, $t(54) = 1.88$, $p = .06$, $p_{rep} = .85$, $d = 0.51$.

*Face Detection*

Our prediction for face detection was the complement of our prediction for the preceding two measures—that participants in the fear condition would report detecting more faces in the ambiguous figures than participants in the disconnected and control conditions. Indeed, orthogonal planned contrasts confirmed this predicted pattern, $t(54) = 2.32$, $p = .02$, $p_{rep} = .92$, $d = 0.63$, and the number of faces reported did not differ between the disconnected and control conditions, $p = .97$.

*Overall Analysis*

To test our overall prediction of a dissociation across measures, we standardized participants' responses across our three critical dependent measures: belief in supernatural agents, percentage of social-connection traits selected, and number of faces reported. A 3 (condition: disconnected, fear, control) $\times$ 3 (measure: supernatural agents, social-connection traits, faces identified) mixed-model ANOVA using these standardized measures yielded only the predicted interaction presented in the results already discussed, $F(4, 108) = 3.67$, $p = .01$, $\eta^2 = .12$.

*Discussion*

Study 3 again confirmed our main prediction that social disconnection increases the tendency to create humanlike agents out of nonhuman agents in one's environment, and demonstrates that this result is not simply produced by any negative emotional state. This experiment also draws a tentative distinction between creating humanlike agents out of nonhumans (anthropomorphism) and seeing humanlike agents in one's immediate environment (something akin to animism). At the very least, this dissociation demonstrates that the fear manipulation in this study had some unique effect on judgment and was not simply a second control condition.

## GENERAL DISCUSSION

> And God stepped out on space,
> And he looked around and said:
> I'm lonely—
> I'll make me a world . . . (Johnson, 1927/1990, p. 17)

Physicists have the scientific tools to suggest that Johnson may have gotten his poem profoundly wrong, but psychologists have the scientific tools to suggest that Johnson may have gotten his poem profoundly backward. In three studies, people who were chronically disconnected from others (Study 1) or momentarily led to think about disconnection (Studies 2 and 3)

appeared to create humanlike agents in their environment—from gadgets to pets to supernatural agents such as God. These studies go beyond simply demonstrating that social disconnection leads people to seek companionship from nonhuman agents, showing that social disconnection can alter the way these agents are conceptualized or represented. Lonely people cannot make themselves a world, of course, but they can make themselves a mindful gadget, a thoughtful pet, or a god to populate that world.

We believe the results of these studies inspire four especially intriguing questions. First, does social disconnection lead people to seek only a sense of connection with others, or does it lead to a more specific search for positive social support? Study 3 provides some tentative evidence for a selective creation of a socially supportive agent in participants' pet ratings, but people also prefer to be with socially unsupportive others than to be isolated (Van Beest & Williams, 2006). Our research does not unambiguously identify the exact kind of humanlike agent a socially disconnected person is likely to create.

Second, these experiments suggest that social disconnection leads people to create humanlike agents in their environment, but is this inferential reproduction effective? The positive correlation between pet ownership and well-being is well documented (Serpell, 1991), as is the correlation between religious belief and well-being (Cacioppo & Brandon, 2002), but surely some agents (e.g., God) satisfy the need for social connection better than others (e.g., gadgets). Does variance in the degree to which these agents satisfy social connection come from the ease with which they can be anthropomorphized? If so, encouraging anthropomorphism among socially disconnected individuals may have some surprising therapeutic benefits.

Third, these experiments provided participants with the opportunity to alleviate a sense of social disconnection by humanizing nonhuman agents, but might some people actually prefer this method for alleviating social disconnection over seeking connection through other humans? Individuals who are rejected or ostracized by one group of people tend to avoid attempting to reconnect with that group and instead seek connection with other groups (Maner et al., 2007). It is at least possible that people who are chronically rejected or ostracized from other humans may eventually come to avoid seeking connection with other humans altogether and instead satisfy their sociality motivation by deliberately seeking connection with nonhuman agents.

Finally, these experiments investigated perceptions of nonhuman agents, but we believe this research has implications for perceptions of humans as well. If social disconnection increases the tendency to seek humanlike agents in one's environment, then a strong sense of social connection should decrease this tendency to seek humanlike agents. A lack of motivation to connect with other humans should decrease the tendency to perceive humanlike traits in these other humans as well. This reasoning suggests that when evaluating other individuals, people who are especially socially connected might also be more likely to *dehumanize* those to whom they are not socially connected (see also Harris & Fiske, 2006; Leyens et al., 2003). We found exactly this pattern in one recent experiment in which participants induced to feel strongly connected to another person were less likely to attribute humanlike mental states to members of an out-group than were those not induced to feel connected to another person (Waytz, Epley, & Cacioppo, 2007). Social disconnection induces the motivation to create humanlike agents of social support, and social connection reduces that motivation. Although being socially connected has many desirable consequences for one's mental and physical health, it may have some undesirable consequences as well.

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## REFERENCES

Adam, E.K., Hawkley, L.C., Kudielka, B.M., & Cacioppo, J.T. (2006). Day-to-day dynamics of experience-cortisol associations in a population-based sample of older adults. *Proceedings of the National Academy of Sciences, USA*, *103*, 17058–17063.

Adler, J. (2005, August 29). In search of the spiritual. *Newsweek*, *146*, 46–64.

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.

Cacioppo, J.T., & Brandon, M.E. (2002). Religious involvement and health: Complex determinism. *Psychological Inquiry*, *13*, 204–206.

Cacioppo, J.T., Hawkley, L.C., & Berntson, G.G. (2003). The anatomy of loneliness. *Current Directions in Psychological Science*, *12*, 71–74.

Cortes, B.P., Demoulin, S., Rodriguez, R.T., Rodriguez, A.P., & Leyens, J.P. (2005). Infrahumanization or familiarity?: Attribution of uniquely human emotions to the self, the ingroup, and the outgroup. *Personality and Social Psychology Bulletin*, *31*, 243–253.

Demme, J. (Director), Harris, T. (Writer), & Tally, T. (Writer). (1992). *Silence of the lambs* [Motion picture]. United States: Orion Pictures Corp.

Demoulin, S., Leyens, J.P., Paladino, M.P., Rodriguez, R.T., Rodriguez, A.P., & Dovidio, J.F. (2004). Dimensions of "uniquely" and "nonuniquely" human emotions. *Cognition & Emotion*, *18*, 71–96.

Diener, E., & Seligman, M.E.P. (2002). Very happy people. *Psychological Science*, *13*, 80–83.

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

Eysenck, H.J., & Eysenck, S.B.G. (1976). *Psychoticism as a dimension of personality*. London: Hodder & Stoughton.

Gardner, W.L., Pickett, C.L., Jefferies, V., & Knowles, M. (2005). On the outside looking in: Loneliness and social monitoring. *Personality and Social Psychology Bulletin*, *31*, 1549–1560.

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

Gross, J.J., & Levenson, R.W. (1995). Emotion elicitation using films. *Cognition & Emotion*, *9*, 87–108.

Guthrie, S.E. (1993). *Faces in the clouds: A new theory of religion*. New York: Oxford University Press.

Harris, L.T., & Fiske, S.T. (2006). Dehumanizing the lowest of the low: Neuroimaging responses to extreme out-groups. *Psychological Science*, *17*, 847–853.

Haslam, N., Bain, P., Douge, L., Lee, M., & Bastian, B. (2005). More human than you: Attributing humanness to self and others. *Journal of Personality and Social Psychology*, *89*, 937–950.

Hawkley, L.C., Masi, C.M., Berry, J.D., & Cacioppo, J.T. (2006). Loneliness is a unique predictor of age-related differences in systolic blood pressure. *Psychology and Aging*, *21*, 152–164.

Heinrich, L.A., & Gullone, E. (2006). The clinical significance of loneliness: A literature review. *Clinical Psychology Review*, *26*, 695–718.

House, J.S., Landis, K.R., & Umberson, D. (1988). Social relationships and health. *Science*, *241*, 540–545.

Hughes, M.E., Waite, L.J., Hawkley, L.C., & Cacioppo, J.T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, *26*, 655–672.

Johnson, J.W. (1990). *God's trombones: Seven Negro sermons in verse*. New York: Viking-Penguin. (Original work published 1927)

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*, 315–334.

Kirkpatrick, L.A., Shillito, D.J., & Kellas, S.L. (1999). Loneliness, social support, and perceived relationships with God. *Journal of Social and Personal Relationships*, *16*, 513–522.

Leyens, J.-P., Cortes, B.P., Demoulin, S., Dovidio, J., Fiske, S.T., Gaunt, R., et al. (2003). Emotional prejudice, essentialism, and nationalism. *European Journal of Social Psychology*, *33*, 703–717.

Loukatos, D. (1976). Personification of capes and rocks in the Hellenic seas. In A. Bharati (Ed.), *The realm of the extra-human* (pp. 467–474). Paris: Mouton.

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.

Marx, K. (1959). *Economic and philosophic manuscripts of 1844*. Moscow: Progress Publishers. (Original work published 1844)

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 and Social Psychology*, *65*, 812–821.

Norenzayan, A., & Hansen, I.G. (2006). Belief in supernatural agents in the face of death. *Personality and Social Psychology Bulletin*, *32*, 174–187.

Pargament, K. (1997). *The psychology of religious coping*. New York: Guilford.

Serpell, J. (1991). Beneficial effects of pet ownership on some aspects of human health and behavior. *Journal of the Royal Society of Medicine*, *84*, 717–720.

Twenge, J.M., Baumeister, R.F., Tice, D.M., & Stucke, T.S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of Personality and Social Psychology*, *81*, 1058–1069.

Twenge, J.M., Catanese, K.R., & Baumeister, R.F. (2003). Social exclusion and the deconstructed state: Time perception, meaninglessness, lethargy, lack of emotion, and self-awareness. *Journal of Personality and Social Psychology*, *85*, 409–423.

Van Beest, I., & Williams, K.D. (2006). When inclusion costs and ostracism pays, ostracism still hurts. *Journal of Personality and Social Psychology*, *91*, 918–928.

Ward, D.S. (Writer/Director). (1989). *Major league* [Motion picture]. United States: Mirage.

Waytz, A., Epley, N., & Cacioppo, J.T. (2007). [Social connection increases dehumanization]. Unpublished raw data.

Wuthnow, R., Christiano, K., & Kuzlowski, J. (1980). Religion and bereavement: A conceptual framework. *Journal for the Scientific Study of Religion*, *19*, 408–422.

Zemeckis, R. (Director), & Broyles, W., Jr. (Writer). (2000). *Cast away* [Motion picture]. United States: DreamWorks SKG.

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