



Loneliness within a nomological net: An evolutionary perspective [☆]

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Abstract

Loneliness is characterized by feelings of social pain and isolation and has both heritable and unshared environmental underpinnings. An evolutionary theory of loneliness is outlined, and four studies replicate and extend prior research on the characteristics of lonely individuals. Studies 1 and 2 indicate that loneliness and depressed affect are related but separable constructs. Study 3 confirms that lonely, relative to nonlonely, young adults are higher in anxiety, anger, negative mood, and fear of negative evaluation, and lower in optimism, social skills, social support, positive mood, surgency, emotional stability, conscientiousness, agreeableness, shyness, and sociability. The set of six personality factors associated with loneliness (surgency, emotional stability, agreeableness, conscientiousness, shyness, and sociability) do not explain the associations between loneliness and negative mood, anxiety, anger, optimism (pessimism), self-esteem, and social support, as each association remained statistically significant even after statistically controlling for these personality factors. Study 4 used hypnosis to experimentally manipulate loneliness to determine whether there were associated

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changes in the participants' personality and socioemotional characteristics. Results confirmed that loneliness can influence the participants' personality ratings and socioemotional states.

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1. Introduction

...by the 1970's, it was dawning on many evolutionary biologists, especially those interested in behaviour, that evolution by natural selection was not much about competition between species, not even mostly about competition between individuals, but was about competition between genes using individuals and occasionally societies as their temporary vehicles. (Ridley, 2000, p. 127).

Loneliness has been described as a complex set of feelings that occurs when intimate and social needs are not adequately met and that “drives” individuals to seek the fulfillment of these needs (Russell, Peplau, & Cutrona, 1980; Weiss, 1973, p. 15). Estimates by Peplau and Perlman (1982) suggest that at any one time approximately 20% of the population complains of feelings of loneliness. Why are people plagued by this plight? In the present paper, we outline an evolutionary model to address this question in which loneliness reflects the operation of selfish genes using individuals to insure their perpetuation.

Darwin's (1959) insight was that organisms compete for resources, and those that had some advantage in a habitat would be more likely to transmit this advantage to future generations via their offspring. Building on Darwin's seminal insight, Dawkins (1990) describes how genes evolve and function to perpetuate themselves. According to Dawkins (1990), the world of the selfish gene is generally one of savage competition, ruthless exploitation, and deceit. Even apparently collective actions that foster survival, such as fish swimming in schools, can be explained in terms of individual self-interest. When sardines are predated, they form a dynamic fish ball as a last means of defense. The emergence and unfolding of this collective action can be explained by a single, selfish rule: Swim to the middle.

The genetic constitution of species characterized by brief periods of dependency is reducible to the reproductive success of individual members of the species. Simply stated, if an organism survives to reproduce, the genes of the organism are more likely to be included in the gene pool of the species. The genetic constitution of *Homo sapiens*, however, derives not simply from an individual's reproductive success but more critically from the success of one's offspring to reproduce (Cacioppo & Hawkey, 2003). Humans are not particularly strong, fast, or stealthy relative to other species. They lost their canine teeth thousands of years ago and they never had the safety offered by natural armor or flight. It is the ability to think and use tools, to employ and detect deceit, and to communicate, work together, and form alliances that makes *Homo sapiens* such a formidable species.

The importance of these capacities produced a selective pressure for larger brains with greater associative, reasoning, integrative, and communicative power (Calvin, 2004). Larger brains were achieved in part by greater folding of the cortices to squash more brain matter into a limited cranial space. Larger brains were also achieved by modifications of the pelvic skeletal structure in women, which although less optimal for walking, increased the likelihood that the mother and infant would survive childbirth. The cranial skull itself

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