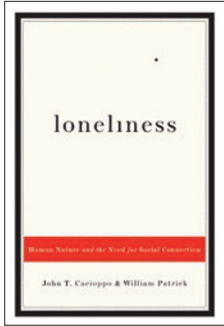


The Lonely Brain



Loneliness

by John T Cacioppo & William Patrick

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Reviewed by Jordan Grafman &
Frank Krueger

Valentine's Day, although garishly promoted by the greeting card and retail industries, still has the power to induce loneliness in many of the lovelorn. Whether you feel lonely or not, there is now a book written for the interested lay person that will tell you almost everything you ever wanted to know about loneliness and why our brains have evolved to facilitate social integration. From the beginning of *Loneliness*, Cacioppo and Patrick explain that being lonely is common, but is not equated to depression, even though the two states can have similar effects on cognition. For example, people who are lonely (or depressed) may demonstrate mildly impaired executive functions, particularly on tasks that require the kinds of control processes that help us navigate multitasking situations. Although depression is often briefly evaluated in normal healthy volunteers and patients participating in research studies, loneliness is almost never objectively assessed. However, given the importance of the cognitive impairments observed in people who are lonely, reported by Cacioppo and Patrick in their book, maybe loneliness should be evaluated if you are interested in accounting for variation in performance on cognitive or social tasks. If loneliness is as common as Cacioppo and Patrick claim, then a more successful society should have some self-interest in remedying it, as being lonely affects not only the person who is lonely, but also affects their family, social group and society.

Of course, this journal is *Nature Neuroscience* and not *Lonely Hearts Magazine*, and Cacioppo and Patrick provide tentative hypotheses about how a lonely person's brain processes information and functions. Being lonely can affect the brain at a number of levels, including genetic, neurotransmitter, hormonal and regional. In turn, individuals can have a genetic predisposition for becoming lonely. A number of studies have now shown that loneliness can run in families or be unique in a single individual. As with most predispositions, the behavioral expression of the gene, with loneliness being the phenotype, requires a cooperative (or some might say uncooperative) environment. The effects of

loneliness on hormones and neurotransmitters are well known, and some of the same chemical suspects involved in depression, such as serotonin, oxytocin and vasopressin, are modulated by loneliness. Finally, the neuropsychological evidence that indicates that people who are lonely perform less well on executive function and divided attention tasks (with some notable exceptions) suggests that loneliness affects frontal lobe functioning, and it turns out that functional neuroimaging studies have shown that frontal lobe regional activity is modulated by loneliness manipulations. The importance of the human frontal lobes for social cognition and emotions is without dispute, although the particulars are debatable. Cacioppo and Patrick further point out that loneliness changes those very cognitive and social-emotional processes in fairly predictable ways that lead to ruminations and thought processes that tend to confirm the person's self-image about being lonely. That confirmation results in more isolation from others, leading to a reduction in pro-social behaviors such as altruism that then reduces the likelihood of receiving altruistic reciprocity from co-workers, friends or family members. Therefore, in societies in which loneliness can flourish, a sense of connectedness to others diminishes and a cycle of isolation is reinforced, making it more difficult not only to help the individual, but to change society.

Before there is a rush to make loneliness another diagnostic category in psychiatry, perhaps we can speak up for the majority of the human population who have felt loneliness at one time or another and who might deny the kinds of associated functional changes described in the book. Loneliness is apparent in almost all human cultures and has been a major theme in music, folk tales, narratives, plays and movies, reinforcing the idea of its commonality. So if loneliness is common (it can be experienced by an orphan in rural Kazakhstan or the President of the United States), it is nevertheless most often transient. Does even transient loneliness produce some of the cognitive and social deficits described above? Cacioppo's studies would suggest the answer to that question is yes, although persistent loneliness may produce more severe symptoms and somatic changes.

Loneliness by Cacioppo and Patrick packs a strong message for the lay reader about the importance of social interaction and the feeling that you are part of the social fabric of your society. The studies cited are compelling, and Cacioppo and Patrick have explained them in a jargon-free way so that the lay reader can understand the meaningfulness of the research. For us, the book was at times repetitive and thematically incoherent as a result of the juxtaposition of vignettes, with data on different themes in the same chapter. Perhaps a second edition of the volume will remedy that. In the meantime, if you are in the northern hemisphere this time of year, grab a cup of tea, pull up a seat in front of the fireplace, sit down and read this book, and then join your friends and family for some social interactions—it might be good for what ails you. ■

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