



Contents lists available at ScienceDirect

Neuroscience and Biobehavioral Reviews

journal homepage: www.elsevier.com/locate/neubiorev



Review

Connecting prosocial behavior to improved physical health: Contributions from the neurobiology of parenting[☆]

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ARTICLE INFO

Article history:

Received 25 July 2014

Received in revised form 19 March 2015

Accepted 10 April 2015

Available online xxx

Keywords:

Altruism
Helping
Caregiving
Health
Bonding
Evolution
Prosocial behavior
Oxytocin
Progesterone
Neuroscience
Neuropeptide
Stress

ABSTRACT

Although a growing body of evidence suggests that giving to (helping) others is linked reliably to better health and longevity for the helper, little is known about causal mechanisms. In the present paper we use a recently developed model of caregiving motivation to identify possible neurophysiological mechanisms. The model describes a mammalian neurohormonal system that evolved to regulate maternal care, but over time may have been recruited to support a wide variety of helping behaviors in humans and other social animals. According to the model, perception of need or distress in others activates caregiving motivation, which in turn, can facilitate helping behavior. Motivational regulation is governed by the medial preoptic area of the hypothalamus, interacting with certain other brain regions, hormones, and neuromodulators (especially oxytocin and progesterone). Consideration of neurohormonal circuitry and related evidence raises the possibility that it is these hormones, known to have stress-buffering and restorative properties, that are responsible, at least in part, for health and longevity benefits associated with helping others.

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[☆] This research was supported by the National Science Foundation grant BCS 0820609 to S.L.B. The authors thank Michael Numan, Stephanie Preston, and Dylan Smith for feedback on earlier drafts of the manuscript.

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<http://dx.doi.org/10.1016/j.neubiorev.2015.04.004>

0149-7634/© 2015 Published by Elsevier Ltd.

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1. Introduction

The human tendency to help others in need – prosocial behavior¹ – has received a great deal of attention from psychologists, biologists, economists, and sociologists. We know, for example, that prosocial behavior is ubiquitous (Rossi, 2001), and that it can be evolutionarily adaptive, particularly when it is reciprocated directly or indirectly (Alexander, 1987; Hamilton, 1972; Nowak and Sigmund, 1998), enables the helper to avoid punishment (e.g., Fehr and Fischbacher, 2003), enhances the helper's reputation and mating success (e.g., Zahavi, 1995; Zahavi et al., 1999), or is directed at related (Hamilton, 1964) or interdependent individuals (Brown and Brown, 2006; Roberts, 2005; Tomasello et al., 2012). Debates continue over the psychological motivation for prosocial behavior (e.g., selfish vs. selfless, Batson, 1998; Batson et al., 1995; Cialdini et al., 1997), but research generally documents that psychological and physical benefits accrue to helpers.

Social psychological studies demonstrate that prosocial behavior can elevate the helper's mood (e.g., Yinon and Landau, 1987) and is associated with relief from negative states such as sadness, distress, and guilt (Cialdini et al., 1997), and improvements in relationship satisfaction (Brunstein et al., 1996). Moreover, recent evidence suggests that providing help may be a more powerful predictor of physical and mental health than receiving help from others (e.g., Brown et al., 2003, 2005, 2008; Schwartz et al., 2003). For example, giving, but not receiving social support, was shown to be associated with improved well-being (Schwartz et al., 2003), reduced morbidity (Avlund et al., 1998; Brown et al., 2005; Hays et al., 1997), recovery from spousal loss (Brown et al., 2008), and longevity (Brown et al., 2003). Importantly, associations of helping behavior with mortality risk and bereavement have been demonstrated using longitudinal designs, and after controlling (statistically) for a variety of possible confounds including demographics, social integration and contact, baseline helping, self-rated health, functional limitations, health behaviors, mental health, interviewer ratings of health, personality traits, and other relationship factors such as dependence or equity. Together this research suggests that links between helping behavior and physical health cannot easily be attributed to a “helping personality,” or to the tendency for healthier individuals to help others (Brown et al., 2003, 2009a; Roth et al., 2013).

Of course, helping others has not always been viewed as beneficial to the helper. Consider data from many studies of informal

caregiving, which suggest that helping family members and loved ones in need produces caregiver distress – psychological burden and compromised health (Schulz et al., 1995; Vitaliano et al., 2003), and even mortality (Schulz and Beach, 1999). Although this negative appraisal of informal caregiving has been pervasive in the informal caregiving literature, most supportive studies are plagued by a host of research design limitations, including reliance on convenience samples, lack of appropriate controls, failure to assess caregiver outcomes longitudinally, and confounds between helping behavior and other, potentially stressful aspects of the caregiving situation.² The majority of “caregiver stress” studies, for example, fail to distinguish between the presumed stress associated with helping *behavior* (e.g., assisting someone with activities of daily living) and stress associated with *feelings* about the recipient (e.g., the sense of grief, sadness, or loss of loving someone who is dying; for a critical review, see Brown and Brown, 2014). Methodological difficulties notwithstanding, and despite meta-analyses showing inconsistent, or no adverse health effects uniquely attributable to informal caregiving (Pinquart and Sorensen, 2003, 2007), mainstream health research and public policy opinion regarding informal caregiving seem decidedly negative (Brown and Brown, 2014).

More recent evidence from better-controlled, large-scale prospective studies suggests that even informal caregivers experience positive states associated with helping others, including improvements in psychological well-being, health, and longevity (Brown et al., 2009a; Fredman et al., 2010; O'Reilly et al., 2008; Poulin et al., 2010; Roth et al., 2013). It should be noted that the caregiver longevity advantage holds even when hours invested in caregiving are relatively high. In those studies reporting hours spent caregiving, the caregiver longevity advantage was significant at >14 h per week in Brown et al. (2009a), and at ≥50 h per week in O'Reilly et al. (2008); there was a nonsignificant ($p < .08$) trend in the direction of a caregiver longevity advantage at >14 h per week in Roth et al. (2013). These findings are consistent with mounting evidence from studies of volunteering demonstrating that volunteers (a) have better health than non-volunteers (for a recent narrative review, see von Bonsdorff and Rantanen, 2011), (b) exhibit a slower

² A case in point is the oft-cited finding that informal caregiving elevates caregiver mortality, reported in three published investigations. In one of these studies, caregiver status was assumed but not established (Christakis and Allison, 2006). In another, there was evidence of increased caregiver mortality in some age-gender groups, but not in others, and mortality rates overall were lower in caregivers than in non-caregivers (Fredman et al., 2008). In the third study, Schulz and Beach (1999) found that their samples of caregivers were 63% more likely than noncaregivers to die within four years. However, their caregiver samples consisted of spouses who were disabled, while the noncaregiver controls were not, thus confounding disability with caregiving, and rendering mortality differences between caregivers and controls uninterpretable. All other investigations of caregiver mortality published to date – larger-scale and better controlled – have not only failed to replicate this effect, but have reported just the opposite: informal caregiving is associated with reduced mortality (Brown et al., 2009a; Fredman et al., 2010; O'Reilly et al., 2008; Roth et al., 2013).

¹ The term, “prosocial behavior”, is used by psychologists to refer to “a broad category of acts that are defined by some significant segment of society and/or one's social group as generally beneficial to other people” (Penner et al., 2005, p. 366). Accordingly, *prosocial behavior* encompasses a broad category of helping phenomena, including what evolutionary scientists (e.g., evolutionary biologists, evolutionary psychologists, behavioral ecologists, and behavioral economists) refer to as “altruism” – behavior that enhances the fitness of the recipient of the help, but diminishes the fitness of the helper (West et al., 2007).

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