

# Evolutionary Theory and Neuroscience: An Explanatory Theory for Social Work

Molly Malany Sayre

*College of Social Work, University of Kentucky, Lexington, Kentucky, USA*

Robert Walker

*Department of Behavioral Science, College of Medicine, University of Kentucky,  
Lexington, Kentucky, USA*

Evolutionary theory and neuroscience are recommended as a foundational theory for social work. Advantages of evolutionary theory include explanatory power, suggestion of interventions to beginning social work practitioners, and accommodation of more specific theories of human behavior. The explanatory power of neuroscience is also discussed, along with its evidence base and compatibility with the strengths perspective and destigmatization work of the profession. Connections between evolutionary theory, neuroscience, and social work values are also discussed.

*Keywords:* Social work theory, evolutionary theory, neuroscience, social work values

Social workers serve a variety of populations, under diverse auspices, with a wide array of service needs. While the literature is extensive on various social work interventions and approaches for client populations, social work theory about problems and their remedies is generally weak. In addition, social work has existed primarily as a practice profession with little perceived need for descriptive or explanatory theories. With the ever-increasing proliferation of interventions and “evidence-based practices,” social workers may find themselves pulled in so many directions that coherent practice becomes impossible. One possible remedy for this fragmentation is to have a theory or framework that can organize the view of human behavior. And, by having a more solid grounding in behavior, social worker sense of mastery might be improved.

Theories used by social workers need to be broad in scope in order to apply to the range of social work practice contexts, yet provide enough specific direction to be helpful in work with clients. In addition, useful theory must account for a wide range of scientific findings across many disciplines in order to satisfy the need for comprehensiveness. In this paper, we explore the potential for drawing from evolution and neuroscience to suggest a theory that might accommodate a wide range of behaviors and that might point to effective interventions as well.

Evolutionary theory, combined with recent findings from neuroscience, could serve this function due to its ability to explain many of the deeper structures of behavior and its potential for accommodating the profession’s current assortment of narrower theoretical perspectives. We will show that neuroscience also offers a grounding to social work that is complementary to both

---

Address correspondence to Molly Malany Sayre, 619 Patterson Office Tower, University of Kentucky, Lexington, KY 40506, USA. E-mail: m.m.s@uky.edu

evolutionary theory and to social work practices. Evolutionary theory combined with neuroscience can strengthen the theoretical foundation of social work and provide coherence for the real-world complexities of social work practice. **This paper explores the suitability of a theory that draws together evolution science and neuroscience to better ground a general biopsychosocial framework and to guide interventions.**

## STRENGTHS OF EVOLUTIONARY THEORY

Unlike psychology, with its rather exclusive focus on the individual, and sociology, with its interest in societies and communities, social work tries to embrace both the individual and the large social environment. **While many social work students learn the ecosystems perspective as a general theoretical perspective (for example, see Morales, Sheafor, & Scott, 2012), it has been rightly criticized for its failure to explain the many complex interactions between person and environment, to guide interventions, and to integrate the methods and purposes of social workers (Wakefield, 1996a, 1996b; McGuire & Troisi, 1998).** The ecosystems perspective fails to provide explanations of behavior or tools for intervention. Some social workers, then, supplement the ecosystems perspective with a variety of theories or, worse, simply practice without any conscious theoretical perspective.

In contrast to the ecosystems perspective, evolutionary theory offers a framework that can explain much of human behavior, can suggest interventions, and can accommodate smaller theories that explain specific aspects of behavior. **The explanatory power of evolutionary theory lies in its universality (McGuire & Troisi, 1998; Cosmides, Tooby, & Barkow, 1992), including the biological, psychological, and social aspects of human experience. "Persons of all known cultures act to reproduce, to survive, to assist kin, and to trade favors with nonkin" (McGuire & Troisi, p. 64). By building on the most basic human (and other animal) behaviors, evolutionary theory rests on millennia of evidence and is applicable across cultures. Further, the concepts utilized in evolutionary theory effectively explain human behavior. It is logical that explanation of human behavior might be found in the evolutionary process that has produced that behavior (Cosmides & Tooby, 1987).** For instance, the concept of pleiotropy, which describes how one gene can have many very different and unexpected expressions, offers an explanation for why genetic traits that seem to be negative persist. **Application of evolutionary theory to development also provides insight into everyday phenomena such as fear of the dark and the occurrence of family conflict (McGuire & Troisi, 1998). Evolutionary theory provides ways to understand both basic and specific human behaviors and could therefore serve as a helpful guiding theory for social workers.**

Evolutionary theory can also suggest modes of treatment or intervention. **Natural selection rewards adaptation to environment; similarly, a purpose of social work is to enhance the fit of a person to the environment. Interventions suggested by evolutionary theory, then, would fall along a spectrum ranging from improving clients' adaptations to current environments to empowering clients to change their environments.** This method is broad enough to address the diversity of practice settings of generalist social workers, yet more directive (and therefore, more helpful) than the current common method: engage, assess, intervene, evaluate (Council on Social Work Education [CSWE], 2008). Evolutionary theory could provide the profession of social work with a general conception of social work methods driven by a common theoretical perspective.

Evolutionary theory might also offer theory integration to social work. Since evolutionary theory addresses nearly all behavior, other theories can be utilized to explain or treat more specific behaviors without being in conflict with the larger framework of evolution. **For instance, Trivers (1974, as cited in McGuire and Troisi, 1998, p. 52) found that conflict between parents and children could be understood from an evolutionary perspective in that children will try to gain**

attention from parents in order to promote their own survival, while parents will turn their attention to further reproduction or other survival tasks. This provides a foundation for Skinner's (n. d.) theory of operant conditioning, which identifies parental attention as a positive reinforcement for children's behavior. Evolutionary theory is broad enough to incorporate other social theories that are compatible with it, thereby providing theory integration to social work.

Although evolutionary theory is able to explain behavior, suggest treatment, and incorporate more limited theories, it is deficient when conceptualized in terms of merely biological goals. A narrow view of evolutionary theory would only identify the goal of maximizing reproduction but, for social work, this is clearly insufficient (Symons, 1992). For evolutionary theory to be helpful to social workers, a broad understanding is needed, one that includes social as well as biological adaptations to social environments.

## NEUROSCIENCE

Neuroscience, which is itself grounded in evolutionary theory (Cozolino, 2010; Farmer, 2009), can provide another component of a theory to guide social work practice. Unlike the near absence of work on evolutionary theory in the social work literature, neuroscience has been used in some social work scholarship. As a general resource, Farmer's (2009) text describes neuroscience as a "missing link," necessary for a comprehensive understanding of human experience. Other social work researchers have applied neuroscience to a variety of topics. Shapiro and Applegate (2000) discussed clinical applications of new information about the impacts of caregiving on early childhood brain development, arguing that

given its enduring commitment to a biopsychosocial perspective, social work is in a unique position to integrate findings from neuroscience and neurobiology with more familiar psychosocial theories of human behavior in order to consider new ways of meeting the challenges that such macro-level changes pose. (p. 10)

Matto and Strolin-Goltzman (2010) advocated incorporation of social neuroscience into treatment development and evaluation. Gerdes, Lietz, and Segal (2011) have made connections between neuroscientific research on mirror neurons (neurons that create in an observer's brain the same experience that is being observed) and measurement of empathy in order to improve assessment of social work clients.

Others in social work have suggested inclusion of neuroscience in social work education. Gerdes, Segal, Jackson, and Mullins (2011) presented a method of engaging students' mirror neurons for the purpose of improving effective development of empathy: "Affect-based experiential learning engages mirror neurons at the visual, auditory, and somatic levels, helping us to relate to experiences we may never have had, thereby increasing empathy" (pp. 118–119). Egan, Neely-Barnes, and Combs-Orme (2011) outlined themes from neuroscience research that can be included in courses in human behavior and the social environment, astutely noting ties to social policy advocacy.

Outside of social work, the growing field of social neuroscience offers a wealth of information to social workers (Farmer, 2009). Examples include Spear's (2010) work on a neuroscientific understanding of adolescence, a neuroscience explanation of psychotherapy by Cozolino (2010), Sasso's (2007) integration of neuroscience and psychoanalysis, and Iacoboni's (2008) telling of the discovery of mirror neurons and its implications. The social neuroscience literature contains resources related to most of the populations served and methods used by social workers.

This body of research about the structure and function of the brain can be helpful to social workers because it is able to explain human behavior and suggest treatment. Neuroscience is also

supported by evidence, which grounds the profession. Further, it is a good match for social work because it is compatible with social work's contemporary and historical perspectives. Together with evolutionary theory, neuroscience provides social work with an applicable unifying theory.

By increasing our understanding of how the brain works, neuroscience is able to explain many of the individual and social problems that social workers are treating (Farmer, 2009). This includes mental health problems but extends to relational and social problems as well. Brain research suggests that many of these problems are related to early brain development and the understanding of the rich interplay between child and environment during that development (Spear, 2010; Farmer, 2009). Studies of nurturing maternal attention provide an example. Cozolino (2010) synthesizes the research showing that

[r]ats who receive more maternal attention have brains that are more robust, resilient, and nurturing of others. They are able to learn faster and maintain memories longer. They are less reactive to stress and are thus able to use their abilities to learn at higher levels of arousal and across more difficult situations. . . . Finally, females growing up with more attentive mothers pass these positive features on to their children. The mechanisms for the association in humans between early secure attachment and healthier minds and bodies is likely similar but far more complex. (pp. 218–219)

While there is much to be learned about the relationship between maternal attachment and brain development among humans, these findings suggest that modes of parenting produce outcomes in the brain that are both individual (increased rate of learning, reduced stress reactivity) and social (capacity for parenting). Neuroscience is increasingly able to explain the conditions that social workers address.

The claims of neuroscience are supported by evidence. In the age of evidence-based practices, a theory for social workers should also have a clear evidence base (Egan et al., 2011). Due to technological advances, neuroscientists are able to explore and understand the human brain at previously unattainable levels of depth and detail. Valkow (2010) reported that “a continuous stream of advances [in neuroscience] is shattering long-held notions about how the human brain works and what happens when it doesn't” (para. 1). Neuroscience is building a body of evidence to explain mental disorders and the impact of social relationships (Cozolino, 2010; Insel, 2010; Warren, 2010). Social workers might be disadvantaged in their practice if not well-schooled in an evidence-based theory that provides data on the conditions they treat.

The information gained through research in neuroscience is highly compatible with the strengths perspective, a practice perspective in which the client's strengths are acknowledged and emphasized by the social worker so that those strengths can be applied to the problems at hand (Morales et al., 2012). A client strength that a social worker can almost always affirm is the client's brain. While it is easy for a client to understand a mental health diagnosis as a pronouncement of brain brokenness, neuroscience allows social workers to inform their clients about how their brains are functioning in ways that would be to their advantage in a certain environment. For instance, a social worker can inform veterans with posttraumatic stress disorder, who are bothered by spacial disorientation and flashbacks to other places, that their brains may have adapted to the extreme conditions which was advantageous in that environment. While there is dysregulation between the amygdala, which is responsible for quick responses to threats, and the prefrontal cortex, the part of the brain that provides greater context so that false threats can be detected, this imbalance can likely be corrected (Cozolino, 2010). This type of explanation of mental illness can be utilized within the strengths perspective of social work.

Utilization of neuroscientific explanations might also contribute to destigmatization. To recognize the present or potential functioning of one's brain as a strength reduces stigmatization of mental illnesses, parenting difficulties, and relational problems. Siegel and Bryson (2011) describe brain development and its connection to specific behaviors in children and the role of effective

responses from adults. They advocate for integration of the “downstairs” brain, including the amygdala, the source of the overwhelming anxiety-related emotions, with the “upstairs” brain, the prefrontal cortex, from which comes rational, self-controlled responses to children. In doing so, moments of failure in parenting can be reframed to the less-stigmatizing description of “our downstairs moments, the times when we’re so out of control that we say or do something we’d never let anyone else do to our child” (p. 64). Instead of the dead-end self-statement “I’m a terrible parent,” neuroscience may offer more accurate and less stigmatizing descriptions of client problems.

Perhaps some of the most significant contributions neuroscience can make to social work come from the discovery of brain plasticity (Siegel & Bryson, 2011; Cozolino, 2010). In contrast to the perception that human development ends in adolescence or early adulthood, research in neuroscience demonstrates “the brain continues to grow as long as we continue to learn, essentially until the day we die” (Cozolino, 2010, p. 70). While our brains are more sensitive to growth-producing experiences at a younger age, humans are capable of continuous brain development because our brains change in response to experiences. Social workers can be encouraged that there is always hope that the right intervention can be effective. In the studies of maternal attention on rats, “it has been found that biological interventions and enriched social and physical environments can reverse the effects of low levels of maternal attention and early deprivation on both HPA [hypothalamic-pituitary-adrenal] activity and behavior” (Cozolino, 2010, p. 223). If interventions can produce brain and behavior changes among our fellow mammals, it is likely that human brains are capable of similar, though more complex, responses. Neuroscience can offer encouraging evidence to social workers that effective interventions will produce change.

Neuroscience offers to social workers the constituents of a theory that can explain phenomena of interest to social workers. It also has a growing evidence base, is compatible with social work’s strengths perspective, addresses stigma, and demonstrates the mechanisms by which social work interventions can be effective. A theory for social workers must also accommodate social work values, the purposes that guide our work.

## EVOLUTIONARY THEORY, NEUROSCIENCE, AND VALUES

While evolutionary theory is essentially value-neutral, social work is not. The only goals acknowledged in evolutionary theory are genetic survival and reproduction. “In evolutionary theory, the ultimate function of any adaptation is to increase the chances of gene survival” (McGuire & Troisi, 1998, p. 43). Further, “a trait is adaptive if it contributes to achieving biological goals” (p. 43). However, contemporary understanding of natural selection includes selection of groups, not just individuals (Carter, Harris, & Porges, 2009). **Therefore, pro-social behaviors are likely to have been selected by the evolutionary process. This seems to dovetail with social work, which promotes not only biological survival but the social goods of well-being, the dignity and worth of individuals, and social justice as well (NASW, 2008). Further development of the relationship between evolutionary theory and social work values is needed.**

Neuroscience more readily meshes with the ethical and moral dimensions of social work. For example, by seeing that one’s experiences have a continuous impact on the brain, neuroscientists are able to observe the impact of injustice or interpersonal harm, such as in the studies of maternal deprivation discussed above. The findings of neurophysiological effects of maltreatment in childhood and the effects of cell volume loss in trauma victims are supportive of the social work principles of advocating on behalf of human rights and the protection of children (Bremner et al., 2003; Bremner, Vythilingam, Vermetten, Vaccarino, & Charney, 2004). Once the neurophysiological impacts of injustice and interpersonal harm are understood, the profession of social work has a clear theoretical foundation for social justice advocacy. Neuroscience provides

the theoretical and, increasingly, empirical evidence that acknowledges the real impacts of injustice on individuals and communities; this can be utilized by social workers to ground their calls for avoidance of these consequences.

A theory for social workers must also accommodate the social work value of the dignity and worth of the person (NASW, 2008). On the surface of it, evolutionary theory appears to disregard the individual because of its focus on the species. However, a closer reading of this approach shows how evolution plays out in individual lives along with their need for social support and nurture in order to thrive. Thus, a combined evolutionary/neuroscientific theory might provide a different scientific basis for the ethical and moral structure of social work.

Lack of knowledge about evolutionary theory could be blinding the profession to the robust explanatory opportunities provided by the theory (Nesse, 2005). Although evolutionary theory offers a “framework . . . for uniting all aspects of a biopsychosocial model,” one factor working against its usage is “the clinician’s pragmatic focus on finding ways to help people now” (p. 903). When considering use of evolutionary theory, social workers can connect the framework to their focus on helping present-day clients, based on the professional value of the dignity and worth of the person. A better understanding of what evolution tells us about how individuals must thrive in a social context might bolster this view.

Neuroscience may have more theoretical power when applied to the individual than evolutionary theory. Brain plasticity informs us of our physiological responses to our unique experiences, and these responses affect (and perhaps determine) our thoughts, feelings, and behavior. As no mosaic of experiences is the same, no two human brains are identical, which elevates the place of the individual. Further, the impacts of injustice are identified as important for the effects experienced by the individual. The focus of social neuroscience on the individual appears highly compatible with the valued place of the individual in social work.

## CONCLUSION

In his argument against the need for a unity of knowledge, Rorty (1998) states that the humanities, as compared to the natural sciences, are useful in making “suggestions about what to do with the things and people we already have, and what new sorts of things and people we should try to bring into being” (p. 33). While this may be a deficiency of evolutionary theory, neuroscience is able to speak both the language of empirical, physiological research and, with minimal translation, the language of what human society can and should be. Neuroscience, grounded in evolutionary theory, can provide a coherent way to organize an understanding of human behavior and social work practice as well. Future scholarship and research ought to explore how this synthetic approach might yield positive results for social workers and their clients.

## REFERENCES

- Bremner, J., Vythilingam, M., Vermetten, E., Southwick, S., McGlashan, T., Nazeer, A., . . . Garg, P. (2003). MRI and PET study of deficits in hippocampal structure and function in women with childhood sexual abuse and posttraumatic stress disorder. *American Journal of Psychiatry*, *160*, 924–932.
- Bremner, J., Vythilingam, M., Vermetten, E., Vaccarino, V., & Charney, D. (2004). Deficits in hippocampal and anterior cingulate functioning during verbal declarative memory encoding in midlife major depression. *American Journal of Psychiatry*, *161*, 637–645.
- Carter, C. S., Harris, J., & Porges, S. W. (2009). Neural and evolutionary perspectives on empathy. In J. Decety & W. Ickes (Eds.), *The social neuroscience of empathy* (pp. 169–182). Cambridge, MA: The MIT Press.
- Cosmides, L., & Tooby, J. (1987). From evolution to behavior: Evolutionary psychology as the missing link. In J. Dupré (Ed.), *The latest on the best: Essays on evolution and optimality* (pp. 277–307). Cambridge, MA: The MIT Press.

- Cosmides, L., Tooby, J., & Barkow, J. H. (1992). Introduction: Evolutionary psychology and conceptual integration. In L. Cosmides, J. H. Barkow, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 3–15). New York, NY: Oxford University Press.
- Council on Social Work Education. (2008). *Educational policy and accreditation standards*. Retrieved from <http://www.cswe.org/File.aspx?id=13780>
- Cozolino, L. (2010). *The neuroscience of psychotherapy: Healing the social brain* (2nd ed.). New York, NY: W. W. Norton & Co.
- Egan, M., Neely-Barnes, S. L., & Combs-Orme, T. (2011). Integrating neuroscience knowledge into social work education: A case-based approach. *Journal of Social Work Education, 47*(2), 269–282.
- Farmer, R. L. (2009). *Neuroscience and social work practice: The missing link*. Los Angeles, CA: SAGE Publications.
- Gerdes, K. E., Lietz, C. A., & Segal, E. A. (2011). Measuring empathy in the 21st century: Development of an empathy index rooted in social cognitive neuroscience and social justice. *Social Work Research, 35*(2), 83–93.
- Gerdes, K. E., Segal, E. A., Jackson, K. F., & Mullins, J. L. (2011). Teaching empathy: A framework rooted in social cognitive neuroscience and social justice. *Journal of Social Work Education, 47*(1), 109–131.
- Iacoboni, M. (2008). *Mirroring people: The new science of how we connect with others*. New York, NY: Farrar, Straus, & Giroux.
- Insel, T. R. (2010). Understanding mental disorders as circuit disorders: A decade after the decade of the brain. *Cerebrum*. Retrieved from <https://www.dana.org/news/cerebrum/detail.aspx?id=25386>
- Matto, H. C., & Strolin-Goltzman, J. (2010). Integrating social neuroscience and social work: Innovations for advancing practice-based research. *Social Work, 55*(2), 147–156.
- McGuire, M., & Troisi, A. (1998). *Darwinian psychiatry*. New York, NY: Oxford University Press.
- Morales, A. T., Sheafor, B. W., & Scott, M. E. (2012). *Social work: A profession of many faces* (12th ed.). Boston, MA: Allyn & Bacon.
- National Association of Social Workers. (2008). *Code of ethics*. Retrieved from <http://www.socialworkers.org/pubs/code/code.asp>
- Nesse, R. M. (2005). Evolutionary psychology and mental health. In D. M. Buss (Ed.), *The Handbook of evolutionary psychology* (pp. 903–927). Hoboken, NJ: Wiley & Sons.
- Rorty, R. (1998). Against unity. *The Wilson Quarterly, 22*(1), 28–38.
- Sasso, G. (2007). *The development of consciousness: An integrative model of child development, neuroscience, and psychoanalysis*. (J. Cottam, Trans.). London, UK: Karnac Books.
- Shapiro, J. R., & Applegate, J. S. (2000). Cognitive neuroscience, neurobiology and affect regulation: Implications for clinical social work. *Clinical Social Work Journal, 28*(1), 9–21.
- Siegel, D. J., & Bryson, T. P. (2011). *The whole-brain child: 12 revolutionary strategies to nurture your child's developing mind*. New York, NY: Bantam Books.
- Skinner, B. F. (n. d.). *A brief survey of operant behavior*. Retrieved from <http://bfskinner.org/bfskinner/SurveyOperantBehavior.html>
- Spear, L. P. (2010). *The behavioral neuroscience of adolescence*. New York, NY: W. W. Norton.
- Symons, D. (1992). On the use and misuse of Darwinism in the study of human behavior. In L. Cosmides, J. H. Barkow, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 137–159). New York, NY: Oxford University Press.
- Valkow, N. D. (2010). Challenges and opportunities in drug addiction research. *Cerebrum*. Retrieved from <https://www.dana.org/news/cerebrum/detail.aspx?id=25802>
- Wakefield, J. C. (1996a). Does social work need the eco-systems perspective? Part 1: Is the perspective clinically useful? *Social Service Review, 70*(1), 1–32.
- Wakefield, J. C. (1996b). Does social work need the eco-systems perspective? Part 2: Does the perspective save social work from incoherence? *Social Service Review, 70*(2), 183–213.
- Warren, K. R. (2010). Tackling the mysteries of alcohol dependence: A decade after the decade of the brain. *Cerebrum*. Retrieved from <https://www.dana.org/news/cerebrum/detail.aspx?id=25390>

Copyright of Journal of Human Behavior in the Social Environment is the property of Taylor & Francis Ltd and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.