

## **Applications of Neurofinance to Financial Therapy**

Behavioral finance acknowledges that participants in the financial world are not entirely rational or self-regulated. Instead, they exhibit normal decision-making tendencies, and an investor's mental and physical health often influences their decision-making process (Statman, 2018). Neurofinance is a new discipline that applies neuroscience to financial behaviors using insights from neuroscience, psychology, and financial theory (Baechler & Germain, 2018; Miendlarzewska et al., 2019) to try to understand the physiological underpinning of these biases (Raggetti et al., 2021; Singhraul & Batwe, 2022; Srivastava et al., 2020; Tseng, 2006). It thus aims to reveal the neurological underpinnings that guide agents' actions in scenarios involving intertemporal choices or risk assessment under uncertainty or ambiguity, investment decisions, and asset market trading (Raggetti et al., 2021).

While behavioral finance as an academic and applied discipline is well-established, neurofinance is relatively new. Ascher et al. (2016) demonstrate the increasing popularity of studies investigating neurofinance, and Sahi (2012) lists a mere eight empirical studies in their literature review, indicating a trend of increasing publications in neuroeconomics and neurofinance research. Since neurofinance is relatively new, a direct application of neurofinance to financial therapy has not yet been established in the literature. Neurofinance/neuroeconomics has been applied to financial planning in general. Nixon (2023), for instance, attempts to bridge the gap between the technical aspects of neuroeconomics and implementation in financial planning practice. Similarly, Fortin et al. (2020) argue for integrating emotional, psychological, physiological, and cognitive functioning into the financial planning process.

This proposal aims to provide some specific applications of neurofinance to financial therapy, which has not been accomplished to date. Specifically, we seek to utilize neurofinance techniques to measure clients' biological reactions in specific situations. A secondary objective is to provide specific exercises that can be used based on that reaction to improve decision-making and clients' mental health. This is an important research topic in today's global environment, as clients from different countries exhibit different cultural characteristics that translate into different emotional reactions. Consequently, neurofinance provides a unique opportunity to apply financial therapy to clients from various cultural backgrounds and to tailor needed interventions/exercises based on their biological responses.

This presentation focuses on five specific applications of neurofinance to financial therapy, with specific exercises and tie-ins to mental health.

### **Biofeedback for Stress Reduction and Impulse Control**

- Application: Real-time feedback on physiological responses (e.g., heart rate, skin conductance) during financial tasks (e.g., budgeting, investing simulations) can help clients identify stress triggers and practice relaxation techniques.
- Exercise: In a safe environment, clients practice budgeting while receiving biofeedback. When stress indicators rise, they pause and use calming tools like deep breathing or mindfulness exercises. Over time, they learn to associate financial tasks with calmer responses, reducing impulsivity and improving decision-making.
- Mental health tie-in: The exercise reduces anxiety and stress often associated with financial issues, improving overall mental well-being and emotional regulation.

### **Neuroimaging for Identifying Implicit Financial Biases**

- Application: Functional magnetic resonance imaging (fMRI) can identify brain regions active during financial decision-making, revealing unconscious biases towards risk, loss aversion, or instant gratification.
- Exercise: Clients undergo fMRI scans while making simulated financial choices. Therapists then discuss the brain activity observed concerning specific decisions, helping clients understand their underlying biases and develop strategies to counter them.
- Mental health tie-in: The exercise promotes financial self-awareness by addressing cognitive distortions contributing to unhealthy financial behaviors, potentially reducing symptoms of anxiety or depression related to finances.

### **Neuromarketing for Ethical Financial Education**

- Application: Understanding how the brain responds to financial messaging can inform the development of educational materials and interventions that are more engaging and impactful.
- Exercise: Therapists use eye-tracking technology to assess client engagement with financial materials (e.g., infographics, videos). Based on this data, they tailor educational resources to cater to individual learning styles and preferences.
- Mental health tie-in: This approach enhances the effectiveness of financial education, leading to healthier financial habits and improved self-efficacy, which can contribute to better overall mental health.

### **Mindfulness-Based Financial Therapy**

- Application: Combining mindfulness practices with financial planning or goal-setting can help clients break unhealthy financial patterns rooted in emotional reactivity and impulsivity.
- Exercise: Clients engage in mindfulness exercises like meditation or body scans before and during financial tasks. This mindful awareness allows them to observe their thoughts and emotions without judgment, leading to more conscious and deliberate financial decisions.
- Mental health tie-in: Mindfulness skills contribute to improved emotion regulation and stress management, leading to increased financial resilience and decreased vulnerability to financial anxiety or fear.

### **Cognitive Behavioral Therapy for Financial Trauma**

- Application: Neuroimaging techniques can pinpoint brain regions associated with financial trauma (e.g., debt, past financial losses). This information can guide therapists in developing targeted cognitive behavioral therapy (CBT) interventions.
- Exercise: Clients identify and challenge negative cognitive distortions related to money through therapeutic techniques like cognitive restructuring and exposure therapy. Neurofeedback can be used to monitor and regulate emotional responses associated with financial triggers.
- Mental health tie-in: This addresses the negative psychological impact of financial trauma, promoting healing and preventing its influence on current financial behaviors and decision-making, ultimately improving mental well-being.

The poster presentation will illustrate these examples with appropriate graphics and tables. These are just a few examples, and the field of neurofinance is constantly evolving, offering various possibilities for future applications in financial therapy.

## References

- Ascher, D., Vieira, W., Silva, D., Pereira, C., Veiga, D., & Souza, A. (2016). Neurofinance: a systematic review about a new way to looking the financial decision-making. *European Journal of Scientific Research* 141.
- Baechler, G., & Germain, L. (2018). A literature review on neurofinance. *Finance*, 39(2), 9-41. <https://doi.org/10.3917/fina.392.0009>
- Fortin, J. (2020). Integrating Interpersonal Neurobiology into Financial Planning: Practical Applications to Facilitate Well-Being A conceptual framework for financial planners to improve client relationships, calm client fears, and gain insight into emotions that lead to financial decisions while promoting well-being. *Journal of Financial Planning* 33(5), 46-54.
- Miendlarzewska, E. A., Kometer, M., & Preuschoff, K. (2019). Neurofinance. *Organizational Research Methods*, 22(1), 196–222. <https://doi.org/10.1177/1094428117730891>
- Nixon, P. (2023). Practical Application of Neuroeconomics in Financial Planning. In: Sarpong, P., Alsemgeest, L. (eds) *Perspectives in Financial Therapy*. Springer, Cham. [https://doi.org/10.1007/978-3-031-33362-0\\_3](https://doi.org/10.1007/978-3-031-33362-0_3)
- Raggetti, G. M., Ceravolo, M. G., Passamonti, L., & Weber, B. (2021). Editorial: Neurofinance. *Frontiers in Neuroscience* 15. <https://doi.org/10.3389/fnins.2021.629154>
- Sahi, S. K. (2012). Neurofinance and investment behaviour. *Studies in Economics and Finance*, 29(4), 246–267). <https://doi.org/10.1108/10867371211266900>
- Singhraul, B. P., & Batwe, Y. (2022). Neurofinance: the new world of finance based on human psychology and individual investment behaviour. *International Journal of Health Sciences*, 2012–2024. <https://doi.org/10.53730/ijhs.v6ns9.12775>
- Srivastava, M., Sharma, G. D., Srivastava, A. K., & Kumaran, S. S. (2020). What's in the brain for us: a systematic literature review of neuroeconomics and neurofinance. *Qualitative Research in Financial Markets*, 12(4), 413–435. <https://doi.org/10.1108/QRFM-10-2019-0127>
- Statman, M. (n.d.). A Unified Behavioral Finance. *The Journal of Portfolio Management*, 44(7), 124-124. [10.3905/jpm.2018.44.7.124](https://doi.org/10.3905/jpm.2018.44.7.124)
- Tseng, K. C. (2006). Behavioral finance, bounded rationality, neuro-finance, and traditional finance. *Investment Management and Financial Innovations*, 3(4), 7-18. <https://www.researchgate.net/publication/265357711>