

Introducing Neuro-Linguistic Processing and Reprogramming (NLPR): The Impact of Language on Emotional Regulation with Insights from Linguistics, Neuroscience, and Physiology

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ABSTRACT

This article introduces an emerging psychotherapeutic approach: Neuro-Linguistic Processing and Reprogramming (NLPR). The developing empirical evidence from neuroscience, linguistics, and physiology sets a foundation for NLPR, which seeks to enhance cognitive and emotional processes. NLPR capitalizes on the ability of language to engage the brain's neurobiological mechanisms involved in emotion regulation and executive functions. NLPR also integrates insights from the Polyvagal Theory to incorporate the nature of physiological responses to linguistic stimuli. This work asserts that the NLPR approach can lead to rewiring neural circuitry and regulation of intense emotions by enhancing linguistic awareness, emotional understanding, interoception, and orientation through repetition. This paper aims to introduce the underpinnings of NLPR and lay the groundwork for how NLPR can be used as a therapeutic tool to strengthen linguistic capacity, emotional articulation, and self-perception, thus fostering emotional regulation and overall well-being. This endeavor concludes with the perspective that NLPR presents a significant advancement in psychotherapeutic practice as it makes optimal use of language to facilitate psychological transformation and personal growth.

Keywords: Neuro-Linguistic Processing and Reprogramming; NLPR; Emotional Regulation; Balance; Language; Therapeutic Intervention

INTRODUCTION

Language is essential in human communication and crucial to forming a subjective worldview. It has a dual function: communicating and influencing cognitive processes, executive control, and emotional stability, ultimately influencing well-being. This article examines the complex connection between language, executive functions, emotional regulation, and wellness and forms the basis for developing Neuro-Linguistic Processing and Reprogramming (NLPR). This strategy integrates and advances the current psychotherapy treatment models by incorporating linguistics, neuroscience, and physiology, presenting NLPR as an innovative psychotherapeutic technique. By highlighting how linguistic stimuli affect cognitive processes and physiological responses, NLPR reveals that word choice has significant implications for health and resilience.

THE INFLUENCE OF LANGUAGE ON EXECUTIVE FUNCTIONS

Executive functions include cognitive processes that support higher-level thinking, namely reasoning, decision-making, problem-solving, delayed gratification, and empathy. These capacities are fundamental for effectively coping with demanding tasks and adapting to change (Diamond, 2013). Moreover, language is

closely related to executive functions, which are revealed through neuroimaging studies that show the activation of specific brain regions responsible for executive control during language-related tasks (Badre & Wagner, 2007). The PFC (prefrontal cortex) is the critical area of the brain responsible for high-level cognitive functions and becomes activated during tasks like reading, writing, and verbal communication. This indicates that the PFC is essential for mental flexibility, working memory, and attentional control since it creates the basis for executive functioning. It's also important to note that language can influence problem-solving and decision-making by molding how people perceive problems and reflect upon options (Tetlock, 2015). Positive language can help to encourage optimism and creativity, while negative language can lead to pessimism and risk-averse assessments that may affect the decision-making process (Baumeister et al., 2001). NLPR harnesses linguistic strategies to improve cognitive processes and higher-order capacities by embracing the significant role of language in developing executive functions leading to emotional regulation.

POLYVAGAL THEORY AND EMOTIONAL REGULATION

The Polyvagal Theory, introduced by Stephen Porges (2007), explains the significance of the Autonomic Nervous System (ANS) in managing the physiological reactions to various stimuli, such as linguistic stimuli. According to the theory, the ANS is divided into three parts: the Ventral Vagal Complex, the Sympathetic Nervous System (SNS), and the Dorsal Vagal Complex, each with a specific function. The Ventral Vagal Complex is responsible for social engagement, safety, and adaptation to change. It can be activated using positive language, promoting feelings of calm and connection, resulting in feelings of safety and belonging (Porges, 2011). On the contrary, negative language can activate stress pathways in the brain, which initiates the SNS and the Hypothalamic-Pituitary-Adrenal (HPA) axis. The stress reaction increases cortisol and adrenaline levels, negatively impacting emotional regulation and cognitive functioning (Shields et al., 2016). Language is also indirectly related to the Dorsal Vagal Complex, usually initiated by an overactivated Parasympathetic response, and identified through the “freeze” reaction, which can be triggered by extreme stress. This response is a primitive reflex to danger, leading to disconnection or shutdown (Van der Kolk, 2014).

According to Polyvagal Theory, these neurobiological mechanisms determine how people manage emotions and relate socially with others. Language in positive environments can lead to social rapport and security and generate physiological conditions suitable for emotional self-control and cognitive flexibility (Porges, 2011). Techniques like vocal prosody, facial expression, and attentive listening can establish a secure communicational space, which promotes emotional regulation and cognitive resilience (Geller & Porges, 2014). NLPR leverages the interaction of word choice and the ANS for intervention to support emotional integration and interpersonal connection.

INTEGRATING LINGUISTIC STRATEGIES INTO INTERVENTIONS

Adding linguistic techniques into the context of therapeutic intervention has been shown to improve emotional regulation and cognitive resilience. For example, Cognitive-Behavioral Therapy (CBT) emphasizes language as a source of processing for both mental and emotional experiences (Beck et al., 1979). CBT involves identifying and challenging dysfunctional thought patterns and language distortions, which leads to more adaptive coping strategies and improved emotional competence (Hofmann et al., 2012). In the same way, Mindfulness-based interventions focus on the verbal component of the process concerning attentiveness with nonjudgmental acceptance of internal experiences (Kabat-Zinn, 1990). Using these techniques, people can consciously redirect negative linguistic cues by practicing mindfulness in word choice to foster emotional regulation and cognitive flexibility, both critical skills (Baer, 2003). Adopting cognitive restructuring, linguistic rephrasing, and self-compassionate self-talk are ways of developing a more positive linguistic environment that can amplify emotional well-being and resilience.

Interventions founded on the principles of Polyvagal Theory give a salient perspective on the neurobiological processes related to emotional regulation and social behavior. Polyvagal-informed interventions create a safe environment that activates the Ventral Vagal Complex and reduces reactivity regarding stress-activating pathways (Porges, 2011). Strategies like matching intonation and gestures and engaging in empathetic listening can create a safe and encouraging linguistic environment, allowing people to regulate their emotions and build cognitive resilience (Geller & Porges, 2014). Therefore, emotional regulation, mental flexibility, and well-being can be improved by bringing linguistic strategies into the therapeutic process.

Neuro-Linguistic Processing and Reprogramming (NLPR) applies linguistic and psychological principles to promote cognitive and emotional change. It leverages insights from linguistics, neuroscience, and physiology and integrates research concerning the effects of language on executive function, as well as neurobiological mechanisms impacting emotional regulation. NLPR incorporates neuroscience concepts to capitalize on the role of repetition concerning neuroplasticity in constructing and strengthening neural pathways (McEwen & Gianaros, 2011). By examining neurobiological mechanisms involved in language processes, NLPR practitioners can identify language patterns that influence cognitive and emotional processes, especially those that affect the ANS (Friston, 2005; Robinson et al., 2012; Silvert et al., 2004).

LANGUAGE AND THE INTERNAL ENVIRONMENT

Inner speech (Brinthaup & Morin, 2023), also known as self-talk (Geurts, 2018), is crucial in processing and shaping emotional and physical states (Kross et al., 2014). This internal environment is a system that is closely connected to the Autonomic Nervous System (ANS), which controls physiological responses to both internal and external stimuli (Porges, 2007). Language used in internal dialogue can be a mechanism for the ANS to activate the Parasympathetic Nervous System (PNS) and enhance both emotional regulation and wellness (Niles et al., 2015). In addition, positive self-talk, using supportive and affirmative language, can activate the Ventral Vagal Complex, triggering feelings of safety and belonging (Falkenström et al., 2015). On the other hand, the automatic self-criticism and pessimism expressed in negative self-talk can result in stress responses that activate stress pathways, thus leading to higher arousal and emotional dysregulation (Aldao et al., 2010). Repeatedly using the same words or phrases in dialogue helps to strengthen neural pathways that are distinctly connected to particular emotional states. For instance, continuous negative speech can intensify feelings of anxiety or depression (Lutz et al., 2008). Unlike negative communication, positive communication can help to develop resilience and promote overall well-being.

Research supports that the language used in internal dialogue can be crucial in regulating the ANS (Moser et al., 2017; Porges, 2022). Researchers found that positive self-talk is related to reduced Sympathetic Nervous System (SNS) activity and heightened Parasympathetic activity, which results in emotional regulation and relaxation due to sensing safety (Kross et al., 2014). In contrast, negative self-talk has been associated with increased Sympathetic arousal and reduced Parasympathetic activity, leading to stress and emotional dysregulation (Eippert et al., 2007). Moreover, it has been demonstrated that neural connections related to specific emotional responses are strengthened by repeating words or phrases, influencing physiological and emotional states in the long term (Kross et al., 2005).

Another critical element regarding internal dialogue is the content and tone of verbal thoughts, which can affect perceptions of the self and the environment. For instance, self-compassion, self-confidence, and a sense of agency can be stimulated by positive self-talk. In contrast, negative self-talk may result in self-doubt, rumination, and distorted perceptions of reality (Neff, 2003). This signifies that emotional health and resiliency can be promoted by learning to be conscious of inner speech and redirecting the self toward self-compassionate language.

Becoming conscious of inner speech is critical to employing NLPR, which incorporates mindfulness practices. Developing mindfulness of internal dialogue enables monitoring inner speech and redirection without bias, thus shifting from negative thought patterns and emotional reactivity (Teper et al., 2013). Mindfulness-based practices integrate linguistic awareness and self-compassionate language to help people develop a more balanced and integrated relationship with the self (Kabat-Zinn, 1990). Hence, it is essential to recognize that language affects the internal world, and by employing mindful self-talk, people can improve their emotional regulation process, cognitive resilience, and well-being.

AN INNOVATIVE APPROACH IN PSYCHOTHERAPEUTIC INTERVENTION

This paper introduces the novel psychotherapeutic approach that employs Neuro-Linguistic Processing and Reprogramming (NLPR), focusing on how it encapsulates the principles of linguistics, neuroscience, and Polyvagal Theory to support cognitive and emotional shifts. It involves empirically validated therapeutic strategies that integrate how language affects executive control, emotional regulation, and neurobiological mechanisms and incorporates the disciplines of linguistics, neuroscience, and physiology. This innovative method applies neuroscience by examining the function of language and how it influences brain circuits crucial for executive functions and emotional control through the neurobiological mechanism of language processing, namely its effects on the ANS and neuronal plasticity. Utilizing this approach, NLPR practitioners can detect linguistic patterns developed over time through repetition and their impact on cognitive and emotional processes, focusing on how language influences the ANS.

Drawing insights from Polyvagal Theory, NLPR concentrates explicitly on the physiological responses triggered by linguistic stimuli. Given that language and the ANS interact, therapists can apply linguistic strategies to promote emotional self-regulation. This makes NLPR a particularly suitable linguistic approach to establishing a supportive inner linguistic environment which can be used as a self-regulatory tool to promote ANS regulation and then can be extended to the external environment. As a therapeutic method, NLPR emphasizes the significance of verbal attentiveness, internal orientation, and reflection to stimulate cognitive resilience and emotional well-being. It aims to support people in restructuring maladaptive communication patterns by replacing them with more adaptive forms of thinking and communication to foster an internal sense of safety. By incorporating NLPR into clinical practice, clinicians can advance their clients' linguistic skills and self-awareness to help them articulate and regulate their emotions and promote their overall health.

NLPR is a step forward in psychotherapy. It is rooted in the evidence of neurophysiology and linguistics, focusing on improving language use in support of cognitive health and emotional resilience. NLPR harnesses the relationship between language, executive functions, emotional regulation, and well-being. By doing this, NLPR highlights the simplicity of emotional regulation through forward-facing, self-directed, strength-based dialogue.

CONCLUSION

Language affects executive control, emotional resilience, and well-being. A positive linguistic environment can enhance cognitive health, emotional strength, and connection with self and others. On the contrary, negative internal and external linguistic environments have been shown to lead to higher levels of stress, emotional disturbance, and conflict. By integrating specific linguistic strategies in therapy and daily communication, individuals can become proficient at managing their emotions, adapting to new information and situations, and maintaining their mental and emotional health. Research shows that language use undeniably impacts the brain and the body; thus, generating linguistic strategies that cultivate positive language can be a fundamental tool for improving mental health and resilience. Cognitive and emotional

states, in conjunction with effective communication practices, can be enhanced by deliberately using positive and encouraging words. NLPR is aimed at guiding people to utilize language that is supportive of their psychological health and balance. NLPR fosters effective communication and functional relationships by influencing personal development and emotional stability.

REFERENCES

1. Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical psychology review*, 30(2), 217–237. <https://doi.org/10.1016/j.cpr.2009.11.004>
2. Badre, D., & Wagner, A. D. (2007). Left ventrolateral prefrontal cortex and the cognitive control of memory. *Neuropsychologia*, 45(13), 2883–2901. <https://doi.org/10.1016/j.neuropsychologia.2007.06.015>
3. Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 10(2), 125–143. <https://doi.org/10.1093/clipsy.bpg015>
4. Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, 5(4), 323–370. <https://doi.org/10.1037/1089-2680.5.4.323>
5. Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive Therapy of Depression*. Guilford Press. doi: 1046/j.1440-1614.2002.t01-4-01015.x
6. Brinthaup, T. M., & Morin, A. (2023). Self-talk: research challenges and opportunities. *Frontiers in Psychology*, 14, Article 1210960. <https://doi.org/10.3389/fpsyg.2023.1210960>
7. Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, 64(1), 135–168. doi: 1146/annurev-psych-113011-143750
8. Eippert, F., Veit, R., Weiskopf, N., Erb, M., Birbaumer, N., & Anders, S. (2007). Regulation of emotional responses elicited by threat-related stimuli. *Human Brain Mapping*, 28(5), 409–423. doi: 1002/hbm.20291
9. Falkenström, F., Hatcher, R. L., Skjulsvik, T., Larsson, M. H., & Holmqvist, R. (2015). Development and validation of a 6-item working alliance questionnaire for repeated administrations during psychotherapy. *Psychological assessment*, 27(1), 169–183. <https://doi.org/10.1037/pas0000038>
10. Friston, K. (2005). A theory of cortical responses. *Phil. Trans. R. Soc.* 815–836. <http://doi.org/10.1098/rstb.2005.1622>
11. Geller, S. M., & Porges, S. W. (2014). Therapeutic presence: Neurophysiological mechanisms mediating feeling safe in therapeutic relationships. *Journal of Psychotherapy Integration*, 24(3), 178–192. doi: <https://doi.org/10.1037/a0037511>
12. Geurts B. (2018). Making Sense of Self Talk. *Review of philosophy and psychology*, 9(2), 271–285. <https://doi.org/10.1007/s13164-017-0375-y>
13. Hofmann, S. G., Asnaani, A., Vonk, I. J. J., Sawyer, A. T., & Fang, A. (2012). The efficacy of cognitive behavioral therapy: A review of meta-analyses. *Cognitive Therapy and Research*, 36(5), 427–440. doi: 1007/s10608-012-9476-1
14. Kabat-Zinn, J. (1990). *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness*. Delta.
15. Kross, E., Ayduk, O., & Mischel, W. (2005). When asking “why” does not hurt. *Psychological Science*, 16(9), 709–715. doi: 1111/j.1467-9280.2005.01600.x
16. Kross, E., Berman, M. G., Mischel, W., Smith, E. E., & Wager, T. D. (2014). Social rejection shares somatosensory representations with physical pain. *Proceedings of the National Academy of Sciences of the United States of America*, 108(15), 6270–6275. doi: 1073/pnas.1102693108
17. Lutz, A., Slagter, H. A., Dunne, J. D., & Davidson, R. J. (2008). Attention regulation and monitoring

- In meditation. *Trends in Cognitive Sciences*, 12(4), 163–169. <https://doi.org/10.1016/j.tics.2008.01.005>
18. Moser, J. S., Dougherty, A., Mattson, W. I. *et al.* (2017). Third-person self-talk facilitates emotion regulation without engaging cognitive control: Converging evidence from ERP and fMRI. *Sci Rep* 7, 4519. <https://doi.org/10.1038/s41598-017-04047-3>
 19. Niles, A. N., Dour, H. J., Stanton, A. L., Roy-Byrne, P. P., Stein, M. B., Sullivan, G., Sherbourne, C. D., Rose, R. D., & Craske, M. G. (2015). Anxiety and depressive symptoms and medical illness among adults with anxiety disorders. *Journal of psychosomatic research*, 78(2), 109–115. <https://doi.org/10.1016/j.jpsychores.2014.11.018>
 20. McEwen, B. S., & Gianaros, P. J. (2011). Stress- and allostasis-induced brain plasticity. *Annual Review of Medicine*, 62(1), 431–445. doi: 1146/annurev-med-052209-100430
 21. Neff, K. D. (2003). Development and validation of a scale to measure self-compassion. *Self and Identity*, 2(3), 223–250. doi: 10.1080/15298860390209035
 22. Porges, S. W. (2007). The polyvagal perspective. *Biological Psychology*, 74(2), 116–143. doi: 1016/j.biopsycho.2006.06.009
 23. Porges, S. W. (2011). *The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation*. Norton.
 24. Porges, S. W. (2022). *Polyvagal Theory: A Science of Safety*. *Frontiers in Integrative Neuroscience*, 16. <https://doi.org/10.3389/fnint.2022.871227>
 25. Robinson, C. W., Best, C. A., Deng, W. (Sophia), & Sloutsky, V. M. (2012). The Role of Words in Cognitive Tasks: What, When, and How? *Frontiers in Psychology*, 3. <https://doi.org/10.3389/fpsyg.2012.00095>
 26. Shields, G. S., Sazma, M. A., & Yonelinas, A. P. (2016). The effects of acute stress on core executive functions: A meta-analysis and comparison with cortisol. *Neuroscience & Biobehavioral Reviews*, 68, 651–668. DOI: 1016/j.neubiorev.2016.06.038
 27. Silvert, L., Delplanque, S., Bouwalerh, H., Verpoort, C., & Sequeira, H. (2004). Autonomic responding to aversive words without conscious valence discrimination. *International journal of psychophysiology : official journal of the International Organization of Psychophysiology*, 53(2), 135–145. <https://doi.org/10.1016/j.ijpsycho.2004.03.005>
 28. Teper, R., Segal, Z. V., & Inzlicht, M. (2013). Inside the mindful mind: How mindfulness enhances emotion regulation through improvements in executive control. *Current Directions in Psychological Science*, 22(6), 449–454. <https://doi.org/10.1177/0963721413495869>
 29. Van der Kolk, B. (2014). *The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma*. New York: Viking.

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