

## Transforming Thoughts with Postural Awareness to Increase Therapeutic and Teaching Efficacy

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### Abstract

This article suggests that clinicians as well as educators should employ simple and quick posture comparison techniques to shift awareness, elevate mood, and support cognitive function. The report examines the impact of a short somatic involvement technique that involved changing one's body posture to reduce the effect of self-evoked memory of stress. Group observations of 90 men and 55 women, mean age 22.5 years, suggest that people were able to reframe stressful memories much more easily when in an upright posture compared to a slouched posture. They reported a significant reduction in negative thoughts as determined by a single factor ANOVA,  $F(1, 285) = 42.92, p = .001$ ; and anxiety and tension as determined by a single factor ANOVA,  $F(1, 287) = 62.38, p = .001$ . We suggest that therapists and clients get up out of their chairs and incorporate body movements when either the therapist or the client feels stuck, in order to reduce rigidity and increase openness of thoughts and emotions facilitated, which may increase educational and therapeutic goals with sustained benefits outside of the classroom or clinic.

**Keywords:** posture; psychotherapy; cognitive behavioral therapy; stress reduction; internal language; breathing

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### Purpose and Background

As patients or students experience psycho-emotional anxiety, whether related to a chief complaint or negatively projecting about the outcome of an exam, there is a tendency to reflect their negative emotions in their body, sometimes slouching in a chair, or almost curling up into a protective position. In a variety of settings, people's posture reveals something about their positive and negative affective state of mind. For example, Riskind (1984) found that people recall more positive (vs. negative) autobiographical memories when seated in an upright posture during therapy sessions. Michalak, Mischkat, and Teismann (2014) as well as Michalak, Rohde, and Troje (2015) found that a slouched versus erect sitting position, or slouched versus erect walking posture, respectively,

leads to more negative processing of emotions surrounding a topic. The observations described in this report relate to the value of asking clients, patients and students to “pay attention and shift intention” about their posture while engaging in learning or therapy processes. For example, this report describes a simple posture-adjustment activity designed to raise awareness about slouched, slumped, or stooped standing or sitting posture in the therapy office—facilitating intentional shifts into a posture that permits better breathing as well as better mood.

There are physiological models that explain the neuroceptive and visceral feedback benefits from posture shifts. For example, Berntson, Gianaros, and Tsakiris (2018) outline the interoceptive and proprioceptive mechanisms by which humans

increase or decrease awareness of their body. In particular, Bernston et al. (2018) describe classes of sensory systems such as proprioceptors involved in joint movements and vestibuloceptors involved in body balance given various contexts of gravity. Bernston et al. (2018, p. 23) also describe how people experience emotion change concomitant with body change by citing others:

Critchley, Mathias, and Dolan (2001, p. 207) asserted that “body state changes, particularly those mediated by the autonomic nervous system, are crucial to the ongoing emotional experience of emotion,” and Goldstein (2012) reported that partial cardiac denervation was associated with fatigue, altered mood, blunted emotion, and decreased ability to concentrate.

Whereas the purpose of this article is to raise awareness about simple posture change techniques that are effective in assisting clients, patients, and students to pay attention to shift their intention, the goal of this report is also to serve as a methodological note rather than an in-depth exposition on posture and emotion mechanisms. For example, there may be some questions raised in the text, such as “What can you do under pressure?” or “How can you keep your cool?” which are intended to stimulate thought about exposures to various types of stresses and strains along with preferred reactions. Asking these kinds of questions is not intended to start a discussion about the wide range of physical and emotional pressures people can encounter, nor to contrast “cool” reactions from “hot and bothered” reactions, nor to address the value of a cool reaction with a 6-s “quick and warm” quieting reflex (Stroebe, 1982).

### What can you do under pressure? How can you keep your cool?

Most brief therapies, typically numbering less than 10 sessions, are often designed to address, manage, or ameliorate various cognitive, affective, and somatic symptoms and complaints and may include teaching quick interventions that are very effective in reducing psychophysiological reactivity. Examples of quick interventions for reducing psychophysiological reactivity include adapted autogenic training or mindfulness techniques; however, even these quick interventions require 20 min of practice (Cruess et al., 2015). Additional quick interventions such as adapted versions of progressive muscle relaxation (Gao, Curtiss, Liu, & Hofmann, 2018); eye movement desensitization and retraining, or EMDR (Navarro et al., 2018) or yoga, breathing, and other meditation, imagery, or

visualization techniques require times greater than a minute (e.g., 5–30 min) to achieve stress reduction outcomes (Brown, Gerbarg, & Muench, 2013). Although these brief therapies can be very helpful in the controlled context of an office visit, in various daily activities, negative thoughts and stress often occur unexpectedly. What is needed are quick strategies, typically that begin to take effect in seconds, to interrupt and change negative self-talk, anxiety, and other stress reactions—especially during high pressure social interactions, during high pressure classroom situations (e.g., test taking) and during high pressure or panic-inducing topics with client and patient sessions involving psychiatry or psychotherapy. Examples of quick interventions include not only the quieting reflex (Stroebe, 1982), but also manipulating particular pressure points (Wang & Kain, 2001), such as the superior lateral wall of the triangular fossa of the ear. This paper reports on observations of a quick intervention related to posture change directed towards increasing awareness about and intentional control over psychophysiological reactions to stress.

Talking, reflecting, problem solving, consulting, counseling, and psychotherapy usually take place while the person is sitting in a fixed position, sometimes related to a person bracing or freezing their posture in a relatively constrained or immobilized position. For example, psychotherapy and counseling sessions usually take place in a private, one-to-one setting in which participants sit in comfortable chairs that may facilitate slouching in the chair with their lower backs slightly rounded. Unfortunately, sustaining posture in this position is associated with experiences of feeling powerless, helpless, and defeated—a position of submission (Cuddy, 2012; Weisfeld & Beresford, 1982). In a slouched, slumped, or stooped position, it is easier to evoke hopeless, helpless, powerless, and defeated thoughts and memories than when sitting upright (Peper, Lin, Harvey, & Perez, 2017). The brain has to work significantly harder, where “working harder” is considered a difficulty for the individual to evoke positive and empowering thoughts and memories compared to when the individual is in an upright erect position (Michalak et al., 2014; Tsai, Peper, & Lin, 2016). Not surprisingly, a slumped posture can be found among the diagnostic feature of depression as described in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; APA, 2013).

There are a variety of techniques which facilitate quick posture change that in turn elevates mood, increased awareness, and perspective building. For

example, either through internal direction, such as directing oneself towards looking up and reaching up, or through external direction of a professional, such as taping their shoulders so the individual positions themselves upright, or through mechanical direction by a wearable device that alerts them to change posture (e.g., signals with vibration, sounds, or visual displays), the person may quickly, in a matter of seconds, decrease experiences of depression and anxiety as well as increase energy (Peper & Lin, 2012; Wilkes, Kydd, Sagar, & Broadbent, 2017). Although there may be questions about what energy, depression, and anxiety levels are in various settings, the purpose of this report is to increase curiosity and awareness about a simple and, most importantly, quick strategy to shift mood using a simple and quick posture change technique.

### Benefits of posture change strategies

The benefits of posture change strategies have also been shown among individuals who suffer from a mild to moderate level of depression (Wilkes et al., 2017). In addition, when subjects sit collapsed rather than upright, they experience more helplessness (Riskind & Gotay, 1982). Even solving math problems during a classroom activity is easier when the individual is sitting upright and erect rather than in a slouched and collapsed position (Peper, Harvey, Mason, & Lin, 2018). Currently, the psychotherapy and psychiatry literature does not really focus on body posture as a potential therapeutic tool for adjusting mood or reducing feelings of powerlessness. Other studies have also addressed the impact of a sitting posture on parameters that are important in various settings from the classroom to a psychotherapy session. For example, Nair, Sagar, Sollers, Consedine, and Broadbent (2015) demonstrated how adopting an upright and seated posture in the face of stressful circumstances can help an individual maintain their self-esteem, reduce negative mood, increase positive mood, and use fewer sadness words compared to when the individual adopts a slumped and seated posture.

Building on the notion of “embodied attitudes,” Briñol, Petty, and Wagner (2009) examined how body postures can influence self-evaluations and metacognitive processes. Briñol et al. (2009) found that the effect of the direction of thoughts (positive or negative) on self-related attitudes was significantly greater when participants wrote down their thoughts while maintaining a confident (upright) posture compared to when they maintained a doubtful posture (slouched). Positive self-evaluation or self-image is one of the main targets or outcomes where

learning is occurring, whether in a classroom or during a psychotherapy session.

The studies mentioned in this report are all consistent with general theories of “embodied cognition” (Niedenthal, 2007; Oosterwijk, Rotteveel, Fischer, & Hess, 2009) which contend that muscular and autonomic states influence emotional and stress regulation. Sitting upright may offer a simple behavioral strategy to help build up resilience to stress and therefore can be integrated into psychotherapy sessions related to stress topics. The effects of a postural intervention on stress responses are particularly relevant to psychotherapy because stress has been implicated in the etiology of depression (Quinn, Grant, & Adam, 2018) as well as other major psychological disorders.

### Positive posture perspective

One more implication of this “positive posture perspective” is to suggest that psychotherapy might be more effective when an upright body posture is infused into therapeutic sessions. Of course, some sessions are done when someone is lying down, and some sessions occur while walking; however, a seated and slouched posture during an office session is contraindicated from the viewpoint of this paper. The effects of changing body posture from slouched, slumped, or stooped offers the potential to benefit psychotherapy interactions related to different disorders, mainly depression and anxiety, or approaches that focus on problem solving. The approach of maintaining an upright position has already been suggested in many settings. This study reported here has three goals: 1) to provide examples of simple techniques for demonstrating and explaining a posture change effect in settings such as a therapy session; 2) to suggest using a positive posture perspective as part of therapeutic work (cognitive or other); and 3) to apply the effects of posture awareness to intentional actions (e.g., more positive posture) outside the clinic.

## Method

### Participants

As part of a curricular classroom practice in four different classes, 145 college students (90 women and 55 men), average age 25.0 (7.6), participated. As a report about an effort to improve the quality of a classroom activity, this report of findings was exempted from Institutional Review Board oversight.

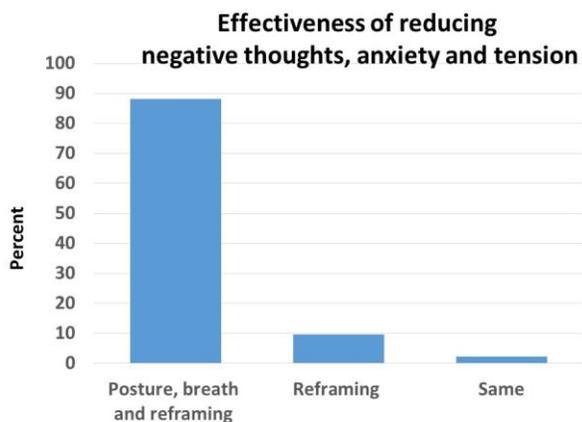
### Procedures

Students in a university class completed an anonymous informational questionnaire (history of

depression, anxiety, blanking out on exams, worrying, slouching). The class was then divided into two groups. All were then asked to evoke and think of a stressful conflict or problem and make it as real as possible for 1 min. Then one group was asked to let go of the stressful memory and experience and reframe it positively (reframing practice; RP), while the other group was asked to sit up erect, look up, take a breath, let go of the stressful memory, and reframe it positively (posture, breath, and reframing practice; PBRP) for 20 s. They then rated the extent to which their negative thoughts and anxiety or tension were reduced, from 0 (*not at all*) to 10 (*totally*). The groups then repeated the study except the RP group now did PBRP and the PBRP group now did RP.

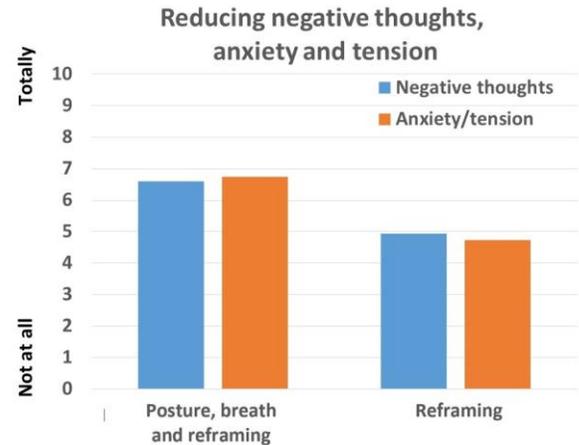
## Results

As shown in Figure 1, 88.2% of the students rated the PBRP more effective than the RP, while 9.6% rated RP more effective than the PBRP, and approximately 2.2% rated them the same.



**Figure 1.** Percentage of students rating PBRP as more effective than RP in reducing negative thoughts, anxiety, and stress.

The responses suggested a reduction in negative thoughts when they practiced PBRP ( $M = 6.6$ ) compared to when they practiced RP ( $M = 5.0$ ), as determined by a single factor ANOVA,  $F(1, 285) = 42.92, p = .001$ . They reported a reduction in anxiety and tension when they practiced PBRP ( $M = 6.7$ ) compared to when they practiced RP ( $M = 4.7$ ), as determined by a single factor ANOVA,  $F(1, 287) = 62.38, p = .001$ . These results are graphically displayed in Figure 2.



**Figure 2.** Self-rating changes in reduction of negative thoughts and anxiety or tension.

There were no significant correlations between the two techniques (RP vs. PBRP) and the self-rating of depression, anxiety, energy level, sitting or standing slouched, worrying, blanking out on exams, gender, and age. There was one noteworthy difference between men and women, where RP appeared to reduce negative thoughts more for men ( $M = 5.42$ ) than women ( $M = 4.64$ ) as determined by a single factor ANOVA,  $F(1, 142) = 4.09, p = .045$ . There were no significant differences between men and women for reduction of anxiety or stress by PBRP.

There was another noteworthy difference due to the order effect of PBRP and RP in reducing negative language. RP was rated more effective in reducing negative thoughts if it was carried out first, rather than second. If RP was second, after PBRP, then RP was rated as less effective, as determined by a single factor ANOVA,  $F(1, 63) = 8.50, p = .005$ . There were no other significant differences due to order effect. There were no other significant differences between the highest and lowest quartile.

Comparing the top quartile to the lowest quartile of experiencing reduction in negative thoughts and anxiety or stress, there was a noteworthy difference in the self-rating of “depression at this moment” for the top quartile ( $M = 2.57$ ) as compared to the lowest quartile ( $M = 4.51$ ), as determined by a single factor ANOVA,  $F(1, 142) = 4.09, p = .045$ . There were no differences between the 13 participants who reported that RP was more effective than the 124 participants who reported that PBRP was more effective on any of the self-reported measures

(history of depression, anxiety, blanking out on exams, worrying, or slouching).

## Discussion

Changing posture, especially in conjunction with reframing language, is effective in reducing negative language as well as self-reported anxiety or stress compared to reframing language by itself. The classroom observations have implications for counseling and psychotherapy because clients usually sit in a slouched position during the therapeutic session and a “positive posture perspective” can be utilized, especially while clients or patients are exploring new options or interpretations of their experiences.

The findings reported here suggest that it is more challenging to let go of the evoked negative feeling and memories by RP than by PBRP. By shifting the body position to an erect upright position, taking a breath, and then reframing, participants are much more successful in reducing their negative thoughts and anxiety or stress. They report feeling much more optimistic and better able to cope with felt stress (see Table 1 for some sample comments).

The results observed in the classroom setting are not surprising and are part of common knowledge, such as the instructions to take three breaths before answering questions, pausing and reflecting before responding, or taking time to cool down before replying in anger. What makes these observations valuable is practicing a technique where participants could compare the effects of the two different posture awareness strategies. Instead of being told what to do, they could experience and discover which positive posture strategy was more effective for them, since no strategy is effective for everyone.

To assign the appropriate home practice when clients are stressed, it is recommended that practitioners guide their clients through the simple and quick procedures described in this study. Then, if their clients experience PBRP to be more beneficial than RP, or vice versa, they will know which strategy is more effective in interrupting the cycle of negative thinking, anxiety, and stress.

It was not clear why approximately 9.6% of the participants rated RP as more beneficial than PBRP in reducing negative thoughts, anxiety, and stress. Future research is needed to explore the individual differences in response to posture change

techniques under various conditions of classroom and therapy session settings.

For most participants, PBRP was more beneficial than RP and was not affected by the order. Whether PBRP was first or second, there was no change in its mean benefit rating. On the other hand, RP was reported to be significantly less beneficial when it followed PBRP. A hypothesis is that participants found they had a more significant and/or long-lasting decrease in negative language, anxiety, and stress after PBRP and thus, in comparison, found RP less beneficial.

Application of this upright sitting posture or experiencing a general positive posture intervention effect (whether sitting, standing, or lying) can be demonstrated simply and quickly in psychotherapy sessions as part of psychoeducation as well as in classroom or other settings. The demonstration should be even more useful and attractive if done in groups because almost all will report that PBRP is more effective to reduce negative internal language, anxiety, and stress.

The simple and quick technique described here can be used throughout therapy for dealing with negative language and stress. In classical cognitive behavioral therapy (CBT), sitting upright can help the individual replace a thought with a more reasonable one. In third-wave CBT, it can help bypass the negative content of the original language and create a metacognitive change, such as “I will not let this thought control me.” It can also help in acceptance and commitment therapy (ACT) that changing one’s body posture may facilitate the process of acceptance (Hayes, Pistorello, & Levin, 2012). Adopting an upright sitting position and taking a breath is like saying, “I am here. I am present. I am not escaping or avoiding.” This change in body position represents movement from inside to outside, movement from accepting the unpleasant emotion related to the negative thoughts toward a commitment to moving ahead, contrary to the automatic tendency to follow the negative thought. The positive reframing during body position or posture change is not an attempt to color reality in pretty colors, but rather a change of awareness, perspective, and focus that helps the individual identify and see some new options for moving ahead toward commitment according to one’s values. This intentional change in direction is central in ACT and also in positive psychology (Stichter & Saunders, 2018).

**Table 1***Some Representative Comments of the Experience Practicing RP or PBRP*

RP	PBRP
After changing my internal language, I still strongly felt the same thoughts.	I instantly felt better about my situation after adjusting my posture.
I felt a slight boost in positivity and optimism. The negative feelings (anxiety) from the negative thoughts also diminished slightly.	The effects were much stronger and not isolated mentally. I felt more relief in my body as well.
Even after changing my language, I still felt more anxious.	Before changing my posture and breathing, I felt tense and worried. After, I felt more relaxed.
I began to lift my mood up; however, it didn't really improve my mood. I still felt a bit bad afterwards and the thoughts still stayed.	I began to look from the floor and up towards the board. I felt more open, understanding, and loving. I did not allow myself to get let down.
During the practice, it helped calm me down a bit, but it wasn't enough to make me feel satisfied or content; it felt temporary.	My body felt relaxed overall, which then made me feel a lot better about the situation.
Difficult time changing language.	My posture and breathing helped, making it easier to change my language.
I felt anger and stayed in my position. My body stayed tensed and I kept thinking about the situation.	I felt anger but once I sat up straight and thought about breathing, my body felt relaxed.
Felt like a tug of war with my thoughts. I was able to think more positively but it took a lot more brain power to do so.	Relaxed, extended spine, clarity, blank state of mind.

If we consider the studies cited in this report that indicate that changing to an upright posture has a positive impact on energy (Peper & Lin, 2012), mathematical skills (Peper et al., 2018), memory recall (Peper et al., 2017), self-evaluation (Briñol et al., 2009), thoughts and memories (Tsai et al., 2016), and self-focus (Nair et al., 2015) in both normal and depressed individuals (Wilkes et al., 2017), together with the physiological and perhaps even rapid hormonal changes that occur (Carney, Cuddy, & Yap, 2010; Cuddy, 2012), we recommend that this approach should be included in psychotherapy. Indeed, the observations reported here indicate that a "posture awareness" tool is suitable for affecting all kinds of psychotherapeutic languages, including dynamic psychotherapy. This somatic intervention that leads to a positive posture perspective appears to have the potential to connect clients to their strengths, or even perhaps to their authentic self, therefore improving their ability to work courageously in therapy.

As this study indicates, the benefits of simple and quick posture awareness techniques can be accomplished by systematically exploring the effect of the somatic manipulation on thinking and emotion and primarily on the ability to move and create behavioral change. While the elaborated experiments related to manipulating various postures by psychotherapy conditions is beyond the scope of this article, as was already mentioned, sitting posture should not be the only body posture option in therapy. For example, Smith, Davoli, Knapp, and Abrams (2019) showed that standing enhances cognitive control and alters visual search, compared to sitting positions.

Finally, and perhaps most importantly, since the main goal of therapy, and especially CBT, is to provide tools for life, the therapist should guide clients to use this upright sitting and breathing effect in their life outside of the clinic. For that purpose,

clients need a very simple and quick procedure for achieving a positive posture perspective like the one offered here.

Nevertheless, we must be careful in discussing the ultimate positive role of the upright sitting posture. It would be preferable to think about flexibility in the sitting posture rather than indicating a preference for one way of sitting over another. The limitations of this study are found mainly in its research procedure. The procedure involves the risk that a meaningful placebo effect will intervene, since the participants can imagine the predicted or desired results of the experiment. Nevertheless, the main goal of this study was not to prove the effect of a specific or particular somatic manipulation, but rather to suggest to educators and clinicians alike that simple and quick posture awareness techniques can positively benefit their psychoeducational goals. Again, the goal is to describe a simple tool for demonstrating this positive posture perspective effect with the potential for use as a psychoeducation tool, later as a therapeutic tool, and finally as an effective tool that clients can use outside the clinic. By offering here this simple tool or intervention, hopefully these goals will be more achievable.

Future studies in this field of postural psychophysiology should try to find out how good the tool is for a clinical population as part of therapy and how helpful it is in real-life implementations. These future studies will need to be more precise in order to use more correctly and flexibly changing the body posture according to mood and the therapeutic goal at the moment. Future research is also needed to explore the importance of individual differences so that appropriate techniques can be matched to the appropriate participant.

In conclusion, we suggest that therapists and clients get up out of their chairs and incorporate body movements when either the therapist or the client feels stuck in order to reduce rigidity and increase openness of thoughts and emotions. To that end, continue exploring some of following strategies:

- Take a walk with your client for an hour while doing therapy. This has many benefits. Clients can share intimate feelings and thoughts while experiencing the support of the therapist by their side. This also may increase access to felt emotions with less shame because the therapist is not looking at the client and has more freedom.

- Shift position, look up, breathe, and change the internal focus or dialogue whenever you feel stuck, frustrated, rushed to reach a conclusion, or overwhelmed by emotions.
- Pay attention and teach your client to pay attention to his or her emotions and thoughts in order to work flexibly on body change.
- Mark on a tally sheet each time you practice a body change and observe the effect by the end of the day.

Finally, to invoke the views stated many times before that the mind and body are not separate and the mind and body affect one another and are affected by each other, posture providing another example of the psychophysiological principle enunciated by Elmer Green (1999, p. 368):

Every change in the physiological state is accompanied by an appropriate change in the mental–emotional state, conscious or unconscious; and conversely, every change in the mental–emotional state, conscious or unconscious, is accompanied by an appropriate change in the physiological state.

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#### References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Berntson, G. G., Gianaros, P. J., & Tsakiris, M. (2018). Interoception and the autonomic nervous system: Bottom-up meets top-down. In M. Tsakiris & H. De Preester (Eds.), *The Interoceptive Mind: From Homeostasis to Awareness (Part 1)*. Oxford, UK: Oxford University Press. <https://doi.org/10.1093/oso/9780198811930.003.0001>
- Briñol, P., Petty, R. E., & Wagner, B. (2009). Body posture effects on self-evaluation: A self-validation approach. *European Journal of Social Psychology*, 39(6), 1053–1064. <https://doi.org/10.1002/ejsp.607>
- Brown, R. P., Gerbarg, P. L., & Muench, F. (2013). Breathing practices for treatment of psychiatric and stress-related medical conditions. *Psychiatric Clinics of North America*, 36(1), 121–140. <https://doi.org/10.1016/j.psc.2013.01.001>
- Carney, D. R., Cuddy, A. J. C., & Yap, A. J. (2010). Power posing: Brief nonverbal displays affect neuroendocrine levels and risk tolerance. *Psychological Science*, 21(10), 1363–1368. <https://doi.org/10.1177/0956797610383437>
- Critchley, H. D., Mathias, C. J., & Dolan, R. J. (2001). Neuroanatomical basis for first- and second-order representations of bodily states. *Nature Neuroscience*, 4, 207–212. <https://doi.org/10.1038/84048>
- Cruess, D. G., Finitsis, D. J., Smith, A.-L., Goshe, B. M., Burnham, K., Burbridge, C., & O'Leary, K. (2015). Brief stress management reduces acute distress and buffers physiological response to a social stress test. *International Journal of*

- Stress Management*, 22(3), 270–286. <https://doi.org/10.1037/a0039130>
- Cuddy, A. (2012, June). *Your body language shapes who you are* [Video file]. Retrieved from [http://www.ted.com/talks/amy\\_cuddy\\_your\\_body\\_language\\_shapes\\_who\\_you\\_are](http://www.ted.com/talks/amy_cuddy_your_body_language_shapes_who_you_are)
- Gao, L., Curtiss, J., Liu, X., & Hofmann, S. G. (2018). Differential treatment mechanisms in mindfulness meditation and progressive muscle relaxation. *Mindfulness*, 9(4), 1268–1279. <https://doi.org/10.1007/s12671-017-0869-9>
- Goldstein, D. S. (2012). Neurocardiology: Therapeutic implications for cardiovascular disease. *Cardiovascular Therapeutics*, 30(2), e89–e106. <https://doi.org/10.1111/j.1755-5922.2010.00244.x>
- Green, E. (1999). Beyond psychophysics. *Subtle Energies & Energy Medicine*, 10(4), 368–395.
- Hayes, S. C., Pistorello, J., & Levin, M. E. (2012). Acceptance and commitment therapy as a unified model of behavior change. *The Counseling Psychologist*, 40(7), 976–1002. <https://doi.org/10.1177/0011000012460836>
- Michalak, J., Mischnat, J., & Teismann, T. (2014). Sitting posture makes a difference—embodiment effects on depressive memory bias. *Clinical Psychology and Psychotherapy*, 21(6), 519–524. <https://doi.org/10.1002/cpp.1890>
- Michalak, J., Rohde, K., & Troje, N. F. (2015). How we walk affects what we remember: Gait modifications through biofeedback change negative affective memory bias. *Journal of Behavior Therapy and Experimental Psychiatry*, 46, 121–125. <https://doi.org/10.1016/j.jbtep.2014.09.004>
- Nair, S., Sagar, M., Sollers, J., Considine, N., & Broadbent, E. (2015). Do slumped and upright postures affect stress responses? A randomized trial. *Health Psychology*, 34(6), 632–641. <https://doi.org/10.1037/hea0000146>
- Navarro, P. N., Landin-Romero, R., Guardiola-Wanden-Berghe, R., Moreno-Alcázar, A., Valiente-Gómez, A., Lupo, W., ... Amann, B. L. (2018). 25 years of Eye Movement Desensitization and Reprocessing (EMDR): The EMDR therapy protocol, hypotheses of its mechanism of action and a systematic review of its efficacy in the treatment of post-traumatic stress disorder. *Revista de Psiquiatría y Salud Mental (English Edition)*, 11(2), 101–114. <https://doi.org/10.1016/j.rpsm.2015.12.002>
- Niedenthal, P. M. (2007). Embodying emotion. *Science*, 316(5827), 1002–1005. <https://doi.org/10.1126/science.1136930>
- Oosterwijk, S., Rotteveel, M., Fischer, A. H., & Hess, U. (2009). Embodied emotion concepts: How generating words about pride and disappointment influences posture. *European Journal of Social Psychology*, 39(3), 457–466. <https://doi.org/10.1002/ejsp.584>
- Peper, E., Harvey, R., Mason, L., & Lin, I.-M. (2018). Do better in math: How your body posture may change stereotype threat response. *NeuroRegulation*, 5(2), 67–74. <https://doi.org/10.15540/nr.5.2.67>
- Peper, E., & Lin, I.-M. (2012). Increase or decrease depression: How body postures influence your energy level. *Biofeedback*, 40(3), 125–130. <https://doi.org/10.5298/1081-5937-40.3.01>
- Peper, E., Lin, I.-M., Harvey, R., & Perez, J. (2017). How posture affects memory recall and mood. *Biofeedback*, 45(2), 36–41. <https://doi.org/10.5298/1081-5937-45.2.01>
- Quinn, M. E., Grant, K. E., & Adam, E. K. (2018). Negative cognitive style and cortisol recovery accentuate the relationship between life stress and depressive symptoms. *Stress: The International Journal on the Biology of Stress*, 21(2), 119–127. <https://doi.org/10.1080/10253890.2017.1414800>
- Riskind, J. H. (1984). They stoop to conquer: Guiding and self-regulatory functions of physical posture after success and failure. *Journal of Personality and Social Psychology*, 47(3), 479–493. <https://doi.org/10.1037/0022-3514.47.3.479>
- Riskind, J. H., & Gotay, C. C. (1982). Physical posture: Could it have regulatory or feedback effects on motivation and emotion? *Motivation and Emotion*, 6(3), 273–298. <https://doi.org/10.1007/BF00992249>
- Smith, K. C., Davoli, C. C., Knapp, W. H., & Abrams, R. A. (2019). Standing enhances cognitive control and alters visual search. *Attention, Perception, and Psychophysics*, 1–10. <https://doi.org/10.3758/s13414-019-01723-6>
- Stichter, M., & Saunders, L. (2018). Positive psychology and virtue: Values in action. *The Journal of Positive Psychology*, 14(1), 1–5. <https://doi.org/10.1080/17439760.2018.1528381>
- Stroebel, C. F. (1982). *QR: The Quieting Reflex*. New York, NY: Putnam.
- Tsai, H.-Y., Peper, E., & Lin, I.-M. (2016). EEG patterns under positive/negative body postures and emotion recall tasks. *NeuroRegulation*, 3(1), 23–27. <https://doi.org/10.15540/nr.3.1.23>
- Wang, S.-M., & Kain, Z. N. (2001). Auricular acupuncture: A potential treatment for anxiety. *Anesthesia & Analgesia*, 92(2), 548–553. <https://doi.org/10.1097/0000539-200102000-00049>
- Weisfeld, G. E., & Beresford, J. M. (1982). Erectness of posture as an indicator of dominance or success in humans. *Motivation and Emotion*, 6(2), 113–131. <https://doi.org/10.1007/BF00992459>
- Wilkes, C., Kydd, R., Sagar, M., & Broadbent, E. (2017). Upright posture improves affect and fatigue in people with depressive symptoms. *Journal of Behavior Therapy and Experimental Psychiatry*, 54, 143–149. <https://doi.org/10.1016/j.jbtep.2016.07.015>

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