

RUNNING HEAD: VALUES AFFIRMATION AND WEIGHT LOSS

The role of the self in physical health:

Testing the effect of a values affirmation intervention on weight loss

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Obesity is a major risk factor for chronic disease (WHO, 2000). Maintaining a healthy Body Mass Index (BMI) requires the ability to cope with stress, which increases caloric consumption (Dallman, 2009), and requires self-control, which is needed to avoid overeating in a society with an abundance of calorie-dense food. Given this, an intervention that bolsters psychological resources for well-being and self-control could promote healthful weight loss.

One such intervention is a values affirmation. Participants write about self-defining values, such as relationships or religion. This affirms their sense of personal worth or “self-integrity” (Steele, 1988; Sherman & Cohen, 2006). Affirmations can buffer self-control by focusing people on higher values rather than immediate impulses (Schmeichel & Vohs, 2009; Sherman & Cohen, 2006). By reminding them of “what’s really important,” affirmation also bolsters people against mundane stressors that might otherwise sap mental resources (Creswell et al., 2005; Koole et al., 1999) needed for self-regulation and effective coping. Although brief, affirmations can have lasting effects if they interrupt ruminative cycles that worsen outcomes over time (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009).

Because women are likely to be especially vulnerable to weight-related stress (Miller & Downey, 1999), this study focused on females. They completed either the affirmation or control exercise, with BMI assessed at baseline and 2.5 months later. Working memory, a critical component of self-control (Hofmann et al., 2010), was also assessed on the assumption that affirmation should free working memory from stressful preoccupations (Klein & Boals, 2001).

Methods

Session 1

Forty-five university women participated in a “Values and Health” study. Similar to North American women (WHO, 2000), 58% were overweight or obese, 42% normal weight ($M_{\text{BMI}}=26.38$, $SD=3.07$). All reported some dissatisfaction with their weight. Most were Caucasian (71%). They participated individually and were randomized to condition. Experimenters were blind to condition.

Following validated procedures (Sherman & Cohen, 2006), participants in the affirmation condition selected their most important value from a list (e.g., close relationships, music; none related to health) and wrote about why it was important to them. Participants in the no affirmation condition wrote about why their ninth value might be important to someone else.

Forty participants (89%) consented to be weighed. Self-reported Session 1 weight was used for the five who did not consent (2 unaffirmed; 3 affirmed). Their degree of BMI change did not differ, $F(1, 35) = .03, p = .86$.

Session 2

Approximately 2.5 months later (76 days; $SD = 26$, range 30-117), 37 Session 1 participants (82%) attended Session 2. Attrition did not differ by condition: 18 of 23 affirmed 19 of 22 nonaffirmed returned, Yates-correct $\chi^2(1, N=45) < 0.2, ns$. Session 2 attendees and non-attendees did not differ in baseline weight, $F < 1, ns$.

Because waist circumference is a health risk beyond BMI (WHO, 2000), Session 2 included measures of both weight and waist circumference (WHO, 2000). To reduce participant discomfort, experimenters weighed participants while they held a box of unknown weight and measured participants' waistline with nonelastic string. A different researcher later measured each string and subtracted the box's weight from recorded weights.

Working memory was measured with the 2-back version of the N-back task. It requires holding a number in memory over multiple trials (see Jonides et al., 1997).

Results

Given ethnicity effects on health and cognitive performance (Lear, James, Ko, & Kumanyika, 2010; Walton & Spencer, 2009), ethnicity was controlled when it significantly predicted outcomes. Randomization was successful. No condition effects on baseline BMI were found, $F_s < 1, ns$. Table S1 in the supporting information available on-line presents correlations between variables.

Figure 1 displays the results for BMI and weight over time. Both yielded the expected session X condition interaction in a repeated measures ANCOVA, $F(1, 35)=6.98, p=.012$; $F(1, 34)=6.31, p=.017$. BMI and weight increased among unaffirmed participants ($M_s = +.51, +2.76$ pounds, respectively), and decreased among affirmed participants ($M_s = -0.56, -3.41$ pounds). The predicted affirmation effect on Time 2 BMI controlling for baseline BMI, and on Time 2 weight controlling for baseline weight and height, was similarly significant in ANCOVA, $F(1, 34)=7.49, p=.010, d=.93$; $F(1, 33)=6.66, p=.015, d=.90$. The affirmation effect on BMI remained robust even among the most at-risk, those with baseline BMIs ≥ 25 , $F(1, 17)=4.97, p=.040, d=1.08$.

All but two participants consented to waist measurement (95%). With baseline BMI and ethnicity controlled, affirmed participants had smaller waist circumferences ($M=33.29$) than unaffirmed participants ($M=35.11$), $F(1, 31)=4.71, p=.038, d=.78$.

Affirmed participants displayed better working memory, making fewer errors on the N-back test ($M=11.37$) than nonaffirmed participants ($M=13.86$), $F(1, 34)=4.18, p=.049, d=.70$, with ethnicity controlled. Among affirmed participants only, greater working memory also predicted greater weight loss (working memory X condition interaction, $\beta=.14, t(1,32)=2.18, p=.04$).

Discussion

Women who completed a values affirmation weighed less, had lower BMIs, and had smaller waistlines than unaffirmed women 2.5 months later. Effects averaged 0.90 standard deviations. This weight loss effect held among overweight participants. These results provide the first evidence that affirmation can reduce health risks as measured by molar physical markers.

Moreover, working memory, important for self-regulation (Hofmann et al., 2010), was higher among affirmed participants 2.5 months later, suggesting that affirming values freed up attentional resources. Working memory did not mediate condition effects on BMI. Instead, affirmation appeared to harness working memory to health-related goals.

How can brief interventions have long-term effects? According to previous research, they can interrupt recursive cycles that would otherwise produce cumulative costs (Cohen et al., 2009; see also Epton & Harris, 2008). If affirmation helped people maintain self-control in difficult situations (Schmeichel & Vohs, 2009), or buffered them against life stressors as prior research suggests (Creswell et al., 2005; Sherman, Bunyan, Creswell, & Jaremka, 2009), it may have interrupted a feedback loop in which failure to achieve health goals worsened psychological functioning, increasing the risk of further failure (Herman & Mack, 1975), in a repeating cycle. Brief interventions can have lasting benefits when they slow the accumulation of costs.

References

- Cohen, G.L., Garcia, J., Purdie-Vaughns, V., Apfel, N., & Brzustoski, P. (2009). Recursive processes in self-affirmation: Intervening to close minority achievement gap. *Science, 324*, 400-403.
- Creswell, J.D., Welch, W.T., Taylor, S.E., Sherman, D.K., Gruenewald, T.L., & Mann, T. (2005). Affirmation of personal values buffers neuroendocrine and psychological stress responses. *Psychological Science, 16*, 846-851.
- Dallman, M. F. (2009). Stress-induced obesity and the emotional nervous system. *Trends in Endocrinology and Metabolism, 21*, 159-165.
- Epton, T. & Harris, P.R. (2008). Self-affirmation promotes health behavior change. *Health Psychology, 27*, 746-752.
- Herman, C.P., & Mack, D. (1975). Restrained and unrestrained eating. *Journal of Personality, 43*, 647–660.
- Hofmann, W., Friese, M., Schmeichel, B.J., & Baddeley, A. D. (2010). Working memory and self-regulation. In K.D. Vohs & R.F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (2nd ed., pp. 204-225). New York: Guilford Press.
- Jonides, J., Schumacher, E.H., Smith, E.E., Lauber, E.J., Awh, E., Minoshima, S., & Koeppe, R.A. (1997). Verbal working memory load affects regional brain activation as measured by PET. *Journal of Cognitive Neuroscience, 9*, 462-475.
- Klein, K., & Boals, A. (2001). Expressive writing can increase working memory capacity. *Journal of Experimental Psychology: General, 130*, 520-533.
- Koole, S. L., Smeets, K., Van Knippenberg, A., & Dijksterhuis, A. (1999). The cessation of rumination through self-affirmation. *Journal of Personality and Social Psychology, 77*, 111-125.
- Lear, S.A., James, P.T., Ko, G.T., & Kumanyika, S. (2010). Appropriateness of waist circumference and waist-to-hip ratio cutoffs for different ethnic groups. *European Journal of Clinical Nutrition, 64*, 42-61.

- Miller, C.T., & Downey, K.T., (1999). A meta-analysis of heavyweight and self-esteem. *Personality and Social Psychology Review*, 3, 68-84.
- Schmeichel, B.J., & Vohs, K. (2009). Self-affirmation and self-control: Affirming core values counteracts ego depletion. *Journal of Personality and Social Psychology*, 96, 770-782.
- Sherman, D.K., Bunyan, D.P., Creswell, J.D., & Jaremka L.M. (2009). Psychological vulnerability and stress: The effects of self-affirmation on sympathetic nervous system responses to naturalistic stressors. *Health Psychology*, 28, 554-562.
- Sherman, D.K., & Cohen, G.L. (2006). The psychology of self-defense: Self-affirmation theory. In M.P. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 38, pp. 183-242). San Diego, CA: Academic Press.
- Steele, C.M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 21, pp. 261-302). New York: Academic Press.
- Walton, G.M. & Spencer, S.J. (2009). Latent ability: Grades and test scores systematically underestimate the intellectual ability of negatively stereotyped students. *Psychological Science*, 20, 1132-1139.
- World Health Organization (WHO). (2000). Obesity: Preventing and managing the global epidemic. *WHO Technical Report Series*, 894.

Figure Captions

Figure 1. Mean BMI (left panel), and mean weight in pounds controlling for height (right panel), at Session 1 and Session 2, as a function of affirmation condition.

