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**Examining interpersonal self-transcendence
as a potential mechanism linking meditation and social outcomes**

Yoona Kang

Annenberg School for Communication, University of Pennsylvania,
Philadelphia PA 19104 United States of America

[Finalized Author Version](#)

Corresponding author:
Yoona Kang
yoona.kang@asc.upenn.edu

Declarations of interest: None

Abstract

Distinct types of meditation practice addressed in this review can help cultivate skills people may bring to later social interactions. We examine self-transcendence, or the drive to benefit others beyond the self, as a key mechanism through which meditation may promote positive social outcomes. Self-transcendence cultivated through various styles of meditation can impact social outcomes through two main pathways: First, self-transcendence can turn rigid, defensive self-focus into flexible and receptive self-construals. Second, it can increase positive other-focus by integrating reward and social signals in the brain. These accounts offer one practical solution of positively transforming social relations and highlight potential usefulness of considering self-transcendence in researching social effects of meditation.

Highlights

- Certain styles of meditation practice can promote positive social outcomes.
- Self-transcendence, or the drive to benefit others, may be one key mechanism.
- Self-transcendence reduces defensive self-focus.
- Self-transcendence promotes positive other-focus.
- The integration of self, social, and reward processes underpin transcendent experiences.

Keywords: self-transcendence; compassion, lovingkindness, mindfulness, defensiveness, self-relevance, reward, mentalizing, fMRI

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Introduction

Meditation is a solitary practice, whether practiced alone or in a group. Nevertheless, practitioners may choose to bring the qualities of mind cultivated during different types of meditation to everyday life [1], which may increase relationship satisfaction among friends [2] and family members [3]. Studies support the notion that solitary practice of meditation can positively impact later social outcomes, such that mindfulness and lovingkindness/compassion trainings boosted positive social perception [4–6], feelings of connection [6,7] and support [8], while reducing feelings of loneliness [7,9]. However, data on prosocial effects of meditation are inconclusive; a recent meta-analysis shows that the outcomes of meditation are specific to types of prosociality and methodological quality [10], which highlights the need for more precise operationalization and clarifications of specific mechanisms through which certain forms of meditation practices may enhance social outcomes.

Here, we discuss the role of interpersonal self-transcendence, which we define as the drive to benefit others beyond the self [11]. As a process, self-transcendence involves redirecting attention from the self to the wellbeing of others; as a state, it is characterized by positive other-directed cognitions and affect. As such, self-transcendence may function as a mechanism as well as an outcome. We propose that interpersonal self-transcendence is a core mechanism and outcome shared across various types of meditation practices, including mindfulness, compassion, lovingkindness and other forms of contemplative techniques. The quality of self-transcendence people cultivate during these types of meditation practice may diminish rigid, defensive self-

focus, and increase positive other-focus, thereby enhancing social bonds (figure 1). This review also emphasizes *interpersonal* self-transcendence to specifically focus on social aspect of contemplative practices and to distinguish from other forms of self-transcendence that may involve connecting with non-human entities [12]. We further review neural correlates of self-transcendence, with particular focus on the integration of self, social and reward processes underpinning self-transcendence. We note that this conceptualization of self-transcendence is by no means exhaustive; instead, these key elements of self-transcendence have been most consistently relevant to neural studies of self-transcendence.

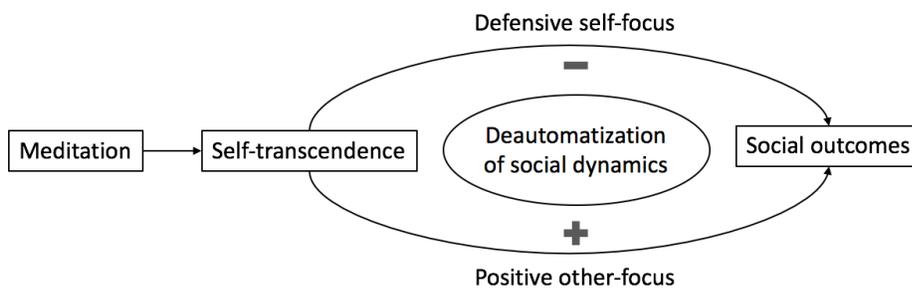


Figure 1. A proposed model illustrating potential mechanisms of meditation impacting social outcomes.

Achieving a mental quality of selfless care for others is a common goal across the most extensively studied styles of meditations in contemplative science. In this review, we focus on mindfulness, lovingkindness, and compassion meditations that we argue share the common component of self-transcendence. For example, mindfulness meditation involves nonjudgmentally attending to present awareness [13], thereby loosening one's attachment to self-serving needs and defensiveness around the idea of permanent self [14], which can naturally lead to love and compassion for others [15]. In parallel, lovingkindness and compassion meditations

involve making directed positive well-wishes and cultivating concern for others, independent of self-relevance and closeness of the target individuals [16]. Other psychological interventions such as value affirmation [17] and interventions to increase purpose in life [18] have also been used to engage the process of self-transcendence.

Self-transcendence and reducing defensive self-focus

Interventions intended to engage self-transcendence can positively impact social outcomes by diminishing defensive self-focus and increasing positive other-focus. In particular, one set of psychological barriers that can harm social relations is self-enhancement motives, or the self-focused drive to protect and maintain positive self-views [19]. Because people are often motivated to feel good about themselves, they may put down other individuals or groups in order to feel better about themselves by comparison [20], or react defensively when they encounter potential threats to positive self-views [21]. Defensive communication in a relationship can damage the ability to admit and discuss one's potential shortcomings [22] and over time, may herald the end of close relationships [23,24].

If defensive self-focus is harmful for social relations, then strategies that reduce the need to enhance the self may help overcome barriers to achieving social bonds. In particular, meditation practices can help overcome defensive and potentially harmful patterns of self-focus by allowing people to zoom out and focus on values beyond the self, in other words, by transcending the self [11]. For example, tasks that share an element of self-transcendence, such as mindfulness and compassion-based meditations, can reduce narrative self-focus and increase malleability of self-processing [25]. That is, taking a self-transcendent stance can help redirect one's attention from the self to others, thereby extricating one's awareness from identifying with the self-absorbed mental events which do not necessarily represent facts based in reality, a

process called decentering [26]. By engaging the process of decentering, self-transcendence can help reduce defensive reactivity and promote accurate understanding of and empathic response to subsequent information that may pose potential threats to self-image.

Consistent with the idea that self-transcendence can reduce defensive self-focus, when faced with messages that are potentially threatening to positive self-views, dispositional mindfulness [27] and undergoing a compassion induction [11] predicted decreases in self-focused negative emotions such as feelings of shame when people were exposed to messages encouraging behavior change. Further, when faced with potentially threatening information that may undermine positive self-views (e.g., messages highlighting one's unhealthy behavior), those who pursue self-transcendent values were less likely to show activity in neural regions associated with threat response, including amygdala and anterior insula [28].

More generally, neural data further support the view of diminished narrative self-focus following meditation training and potentially through self-transcendence, indexed by reduced activity in primary nodes of narrative self-referential system (i.e., medial prefrontal cortex [MPFC], posterior cingulate cortex [PCC]; [29]). Meditation expertise was associated with reduced activity in MPFC and PCC at rest [30,31]. During an open monitoring exercise that involved focusing on present moment experiences without elaboration, 8-weeks of mindfulness training was associated with reduced MPFC activity [32]. Further, experienced meditators (vs. novices) showed lower activity in MPFC and PCC during three types of meditation practices (open monitoring, focused attention, compassion) [33]. However, given the lack of existing data, it is unclear how self-transcendence may influence the experiential form of self-processing, which may be a fruitful avenue for future research.

Meditation experts (vs. novices) also showed greater functional connectivity between regions implicated in self-referential processing (MPFC, PCC) and other brain regions associated with interoceptive awareness and cognitive control at rest [33]. Increased functional integration and control in regions implicated in self-related processing potentially supports the view that meditation enables “readiness for change” [34], with which individuals may be able to flexibly transform previously established automatic patterns of social relations [35,36]. That is, rather than simply decreasing functional activity related to self-processing, some meditations may facilitate context-dependent control of self-processing which flexibly recruits appropriate networks when needed.

Increased flexibility in neural regions associated with self-processing may support the attention allocation process during self-transcendence (e.g., switching from the usual self-focus to the wellbeing of others), and might be one mechanism through which meditation may increase flexibility of self-construals. Future studies may examine whether specific forms of meditation designed to engage self-transcendence are associated with increased control and flexibility in functional dynamics within and between neural networks of self-referential system. In particular, one effective way of diminishing defensive self-focus is by having positive curiosity toward others, which can naturally shift one’s attention toward others away from the threatened aspects of the self. Next, we discuss the integration of reward and social processes as another key component of self-transcendence that may help enhance social bonds by boosting positive other-focus.

Self-transcendence and increasing positive other-focus

A self-transcendent state is often described to be positive and intrinsically rewarding, characterized by expansive feelings of joy and elation [25]. Consistent with this view, those who

made positive well-wishes for others in lovingkindness meditation training, compared to waitlist controls, showed a greater boost in positive emotions [37]. Further, reflecting on one's core values like family and friends through value affirmation promoted positive other-directed emotions such as feelings of love and connection [38]. Self-transcendence tasks such as compassion [11,39,40] and value affirmation [11,41] also tend to up-regulate activity in ventromedial prefrontal cortex (VMPFC) and ventral striatum (VS), regions associated with reward and positive valuation [42], potentially corresponding to the experience of positive other-directed emotions and social reward.

Importantly, the positive aspects of self-transcendent experiences are distinct from self-serving hedonic pleasure [43] in that they are driven by the desire to meet others' needs, as opposed to self-directed positive emotions that are driven by self-enhancing needs [25]. As such, the effect of positive affect on social outcomes may also depend on the engagement of social cognition and the degree to which reward and social processes interact.

In particular, the social process of inferring the needs, desires, and feelings of others, which can be achieved through the process of mentalizing, is a core component of self-transcendent experiences; as might be expected, compassion practice was shown to increase self-reported levels of mentalizing activity [44]. In the brain, a compassion task also boosted activity in right temporal parietal junction (RTPJ) [11], a key region that selectively responds when reasoning about the contents of others' minds [45,46]. Further, compassion practice (vs. a control activity) was associated with greater RTPJ activity, as well as greater functional coupling of regions implicated in social (RTPJ) and reward (VMPFC) processing, suggesting the possibility of integrated social and reward processes during self-transcendence (Kang et al., unpublished). The integration of reward and social processes, along with increased malleability of self

processing as a result of self-transcendence training, may in turn lead to positive social outcomes via various pathways, which we discuss next.

Integration of self, social, and reward processes and social outcomes

Although it might be possible to achieve personal benefits through meditation practice without experiencing self-transcendence, we view that all three components of self-transcendence discussed above (self, social, reward) are necessary in order for meditation practice to enhance social bonds. For instance, if the motivation is to serve self-enhancing goals that highlight social rewards without diminished self-focus (e.g., doing mindfulness practice to excel at work and acquire fame and status), such meditation practice might be less effective in decreasing rigidity of defensive self-focus and improving social outcomes. However, we argue that contemplative practices may enhance social outcomes even when the explicit goal is self-serving (e.g., practicing compassion to improve one's own mood). That is, if the practice induces self-transcendence (operationalized as positive other-focus), whether the practitioner initially intended or not, this can still increase plasticity of self, social, and reward processes, which can enhance social outcomes.

First, self-transcendence may lessen defensiveness that harms mutual understanding. Supporting this view, increased positive emotions gained by lovingkindness practice predicted increased feelings of closeness to others [47]. Similarly, self-transcendent feelings of love and connection after value affirmation decreased defensiveness after an ego threat [38]. In a follow-up study, those randomly assigned to reflect on self-transcendent (family, friends) vs. self-enhancing (power, wealth) values were subsequently less influenced by the negative effects of social rejection; able to cope more adaptively by exerting greater cognitive control [17].

Another pathway through which self-transcendence may lead to social bonding is by promoting safety and reward-based associative learning. Recent evidence suggests that some reward-related neural regions also detect safety signals and dampen threat-related neural activity [48,49]. Reward and safety signals, combined with social processing during self-transcendence, may in turn motivate more curiosity, exploration, learning, and memory formation [50]. Thus, it is possible that self-transcendence primes openness to subsequent new information by activating such a positive social reward stance, which allows for a less reactive, non-defensive, and open hypothesis testing mindset. In this way, it gives a possibility for new configurations of social dynamics, in which individuals are less defensive even when facing potential ego threats.

Conclusion

Meditation practice, though solitary, cultivates skills that people may bring to social interactions. We proposed self-transcendence, an integral component of various contemplative traditions, as a key mechanism through which meditation may promote positive social outcomes. Self-transcendence cultivated through certain types of meditation such as mindfulness, compassion, and lovingkindness can turn defensive self-focus into more open and flexible self-construals, while integrating reward and social signals in the brain. This integration may enable non-defensive attitudes in social relations, being able to hold multiple perspectives. These accounts offer one practical solution of transforming maladaptive ruts and patterns in social relations, and highlight the usefulness of considering self-transcendence in researching social effects of meditation.

Acknowledgements

The author thanks Emily Falk and Jack DeTar for critical feedback. This work was supported by NIH/National Cancer Institute Grant (1R01CA180015-01), Mind and Life Varela Research Grant, and HopeLab Grants.

References

- [1] N. Thera, *The Heart of Buddhist Meditation: Satipaṭṭhāna : a Handbook of Mental Training Based on the Buddha's Way of Mindfulness, with an Anthology of Relevant Texts* Translated from the Pali and Sanskrit, Buddhist Publication Society, 2005.
- [2] J.W. Carson, K.M. Carson, K.M. Gil, D.H. Baucom, Mindfulness-based relationship enhancement, *Behav. Ther.* 35 (2004) 471–494.
- [3] J.D. Coatsworth, L.G. Duncan, M.T. Greenberg, R.L. Nix, Changing Parent's Mindfulness, Child Management Skills and Relationship Quality With Their Youth: Results From a Randomized Pilot Intervention Trial, *J. Child Fam. Stud.* 19 (2010) 203–217.
- [4] Y. Kang, J.R. Gray, J.F. Dovidio, The Head and the Heart: Effects of Understanding and Experiencing Lovingkindness on Attitudes Toward the Self and Others, *Mindfulness* . 6 (2015) 1063–1070.
- [5] Y. Kang, J.R. Gray, J.F. Dovidio, The nondiscriminating heart: lovingkindness meditation training decreases implicit intergroup bias, *J. Exp. Psychol. Gen.* 143 (2014) 1306–1313.
- [6] C.A. Hutcherson, E.M. Seppala, J.J. Gross, Loving-kindness meditation increases social connectedness, *Emotion.* 8 (2008) 720–724.
- [7] K.C. Adair, B.L. Fredrickson, L. Castro-Schilo, S. Kim, S. Sidberry, Present with You: Does Cultivated Mindfulness Predict Greater Social Connection Through Gains in Decentering and Reductions in Negative Emotions?, *Mindfulness* . 9 (2018) 737–749.
- [8] B.L. Fredrickson, M.A. Cohn, K.A. Coffey, J. Pek, S.M. Finkel, Open hearts build lives: positive emotions, induced through loving-kindness meditation, build consequential personal resources, *J. Pers. Soc. Psychol.* 95 (2008) 1045–1062.
- [9] J.D. Creswell, M.R. Irwin, L.J. Burklund, M.D. Lieberman, J.M.G. Arevalo, J. Ma, E.C. Breen, S.W. Cole, Mindfulness-Based Stress Reduction training reduces loneliness and pro-inflammatory gene expression in older adults: a small randomized controlled trial, *Brain Behav. Immun.* 26 (2012) 1095–1101.
- [10] U. Kreplin, M. Farias, I.A. Brazil, The limited prosocial effects of meditation: A systematic review and meta-analysis, *Sci. Rep.* 8 (2018) 2403.
- [11] Y. Kang, N. Cooper, P. Pandey, C. Scholz, M.B. O'Donnell, M.D. Lieberman, S.E. Taylor, V.J. Strecher, S. Dal Cin, S. Konrath, T.A. Polk, K. Resnicow, L. An, E.B. Falk, Effects of self-transcendence on neural responses to persuasive messages and health behavior change, *Proc. Natl. Acad. Sci. U. S. A.* 115 (2018) 9974–9979.
- [12] M.R. Levenson, P.A. Jennings, C.M. Aldwin, R.W. Shiraishi, Self-transcendence: conceptualization and measurement, *Int. J. Aging Hum. Dev.* 60 (2005) 127–143.
- [13] J. Kabat-Zinn, *Full catastrophe living: The program of the stress reduction clinic at the University of Massachusetts Medical Center*, (1990).
- [14] E. Garland, S. Gaylord, Envisioning a Future Contemplative Science of Mindfulness: Fruitful Methods and New Content for the Next Wave of Research, *Complement. Health Pract. Rev.* 14 (2009) 3–9.
- [15] S. Salzberg, Mindfulness and loving-kindness, *Contemporary Buddhism.* 12 (2011) 177–182.
- [16] J. Kabat-Zinn, S. Salzberg, *Lovingkindness: The Revolutionary Art of Happiness*, Shambhala Publications, 2004.
- [17] A. Burson, J. Crocker, D. Mischkowski, Two types of value-affirmation: Implications for self-control following social exclusion, *Soc. Psychol. Personal. Sci.* 3 (2012) 510–516.

- [18] J.Y. Shin, M.F. Steger, Promoting Meaning and Purpose in Life, in: A.C. Parks, S.M. Schueller (Eds.), *The Wiley Blackwell Handbook of Positive Psychological Interventions*, John Wiley & Sons, Ltd, Chichester, UK, 2014: pp. 90–110.
- [19] C. Sedikides, M.J. Strube, The Multiply Motivated Self, *Pers. Soc. Psychol. Bull.* 21 (1995) 1330–1335.
- [20] C.L. Aberson, M. Healy, V. Romero, Ingroup Bias and Self-Esteem: A Meta-Analysis, *Pers. Soc. Psychol. Rev.* 4 (2000) 157–173.
- [21] K. Witte, M. Allen, A meta-analysis of fear appeals: implications for effective public health campaigns, *Health Educ. Behav.* 27 (2000) 591–615.
- [22] G.H. Stamp, A.L. Vangelisti, J.A. Daly, The creation of defensiveness in social interaction, *Commun. Q.* 40 (1992) 177–190.
- [23] J.M. Gottman, A theory of marital dissolution and stability, *J. Fam. Psychol.* 7 (1993) 57.
- [24] J.M. Gottman, *What predicts divorce?: The relationship between marital processes and marital outcomes*, Psychology Press, 2014.
- [25] D.R. Vago, D.A. Silbersweig, Self-awareness, self-regulation, and self-transcendence (S-ART): a framework for understanding the neurobiological mechanisms of mindfulness, *Front. Hum. Neurosci.* 6 (2012) 296.
- [26] S.L. Shapiro, L.E. Carlson, J.A. Astin, B. Freedman, Mechanisms of mindfulness, *J. Clin. Psychol.* 62 (2006) 373–386.
- [27] Y. Kang, M.B. O'Donnell, V.J. Strecher, E.B. Falk, Dispositional Mindfulness Predicts Adaptive Affective Responses to Health Messages and Increased Exercise Motivation, *Mindfulness* . 8 (2017) 387–397.
- [28] Y. Kang, M.B. O'Donnell, V.J. Strecher, S.E. Taylor, M.D. Lieberman, E.B. Falk, Self-Transcendent Values and Neural Responses to Threatening Health Messages, *Psychosom. Med.* 79 (2017) 379–387.
- [29] R.J. Murray, M. Schaer, M. Debbané, Degrees of separation: a quantitative neuroimaging meta-analysis investigating self-specificity and shared neural activation between self- and other-reflection, *Neurosci. Biobehav. Rev.* 36 (2012) 1043–1059.
- [30] D.R. Vago, Mapping modalities of self-awareness in mindfulness practice: a potential mechanism for clarifying habits of mind, *Ann. N. Y. Acad. Sci.* 1307 (2014) 28–42.
- [31] J.A. Brewer, K.A. Garrison, S. Whitfield-Gabrieli, What about the “Self” is Processed in the Posterior Cingulate Cortex?, *Front. Hum. Neurosci.* 7 (2013) 647.
- [32] N.A.S. Farb, Z.V. Segal, H. Mayberg, J. Bean, D. McKeon, Z. Fatima, A.K. Anderson, Attending to the present: mindfulness meditation reveals distinct neural modes of self-reference, *Soc. Cogn. Affect. Neurosci.* 2 (2007) 313–322.
- [33] J.A. Brewer, P.D. Worhunsky, J.R. Gray, Y.-Y. Tang, J. Weber, H. Kober, Meditation experience is associated with differences in default mode network activity and connectivity, *Proc. Natl. Acad. Sci. U. S. A.* 108 (2011) 20254–20259.
- [34] C. Gärtner, Enhancing Readiness for Change by Enhancing Mindfulness, *Journal of Change Management.* 13 (2013) 52–68.
- [35] Y. Kang, J. Gruber, J.R. Gray, Mindfulness: Deautomatization of Cognitive and Emotional Life, in: *The Wiley Blackwell Handbook of Mindfulness*, John Wiley & Sons, Ltd, 2014: pp. 168–185.
- [36] Y. Kang, J. Gruber, J.R. Gray, Mindfulness and De-Automatization, *Emot. Rev.* 5 (2012) 192–201.
- [37] J. Galante, I. Galante, M.-J. Bekkers, J. Gallacher, Effect of kindness-based meditation on

- health and well-being: a systematic review and meta-analysis, *J. Consult. Clin. Psychol.* 82 (2014) 1101–1114.
- [38] J. Crocker, Y. Niiya, D. Mischkowski, Why does writing about important values reduce defensiveness? Self-affirmation and the role of positive other-directed feelings, *Psychol. Sci.* 19 (2008) 740–747.
- [39] O.M. Klimecki, S. Leiberg, C. Lamm, T. Singer, Functional neural plasticity and associated changes in positive affect after compassion training, *Cereb. Cortex.* 23 (2013) 1552–1561.
- [40] O.M. Klimecki, S. Leiberg, M. Ricard, T. Singer, Differential pattern of functional brain plasticity after compassion and empathy training, *Soc. Cogn. Affect. Neurosci.* 9 (2014) 873–879.
- [41] C.N. Cascio, M.B. O’Donnell, F.J. Tinney, M.D. Lieberman, S.E. Taylor, V.J. Strecher, E.B. Falk, Self-affirmation activates brain systems associated with self-related processing and reward and is reinforced by future orientation, *Soc. Cogn. Affect. Neurosci.* 11 (2016) 621–629.
- [42] O. Bartra, J.T. McGuire, J.W. Kable, The valuation system: a coordinate-based meta-analysis of BOLD fMRI experiments examining neural correlates of subjective value, *Neuroimage.* 76 (2013) 412–427.
- [43] R.M. Ryan, E.L. Deci, On Happiness and Human Potentials: A Review of Research on Hedonic and Eudaimonic Well-Being, *Annu. Rev. Psychol.* 52 (2001) 141–166.
- [44] E. Wallmark, K. Safarzadeh, D. Daukantaitė, R.E. Maddux, Promoting Altruism Through Meditation: An 8-Week Randomized Controlled Pilot Study, *Mindfulness* . 4 (2013) 223–234.
- [45] R. Saxe, A. Wexler, Making sense of another mind: the role of the right temporo-parietal junction, *Neuropsychologia.* 43 (2005) 1391–1399.
- [46] R. Saxe, N. Kanwisher, People thinking about thinking people: the role of the temporo-parietal junction in “theory of mind,” *Neuroimage.* 19 (2003) 1835–1842.
- [47] B.E. Kok, K.A. Coffey, M.A. Cohn, L.I. Catalino, T. Vacharkulksemsuk, S.B. Algoe, M. Brantley, B.L. Fredrickson, How positive emotions build physical health: perceived positive social connections account for the upward spiral between positive emotions and vagal tone, *Psychol. Sci.* 24 (2013) 1123–1132.
- [48] N.I. Eisenberger, S.L. Master, T.K. Inagaki, S.E. Taylor, D. Shirinyan, M.D. Lieberman, B.D. Naliboff, Attachment figures activate a safety signal-related neural region and reduce pain experience, *Proc. Natl. Acad. Sci. U. S. A.* 108 (2011) 11721–11726.
- [49] E.A. Hornstein, M.S. Fanselow, N.I. Eisenberger, A Safe Haven: Investigating Social-Support Figures as Prepared Safety Stimuli, *Psychol. Sci.* 27 (2016) 1051–1060.
- [50] R.A. Adcock, A. Thangavel, S. Whitfield-Gabrieli, B. Knutson, J.D.E. Gabrieli, Reward-motivated learning: mesolimbic activation precedes memory formation, *Neuron.* 50 (2006) 507–517.