

PERSPECTIVE/OPINION

Motivated Cognition: Effects of Reward, Emotion, and Other Motivational Factors Across a Variety of Cognitive Domains

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A growing body of literature has demonstrated that motivation influences cognitive processing. The breadth of these effects is extensive and span influences of reward, emotion, and other motivational processes across all cognitive domains. As examples, this scope includes studies of emotional memory, value-based attentional capture, emotion effects on semantic processing, reward-related biases in decision making, and the role of approach/avoidance motivation on cognitive scope. Additionally, other less common forms of motivation-cognition interactions, such as self-referential and motoric processing can also be considered instances of motivated cognition. Here I outline some of the evidence indicating the generality and pervasiveness of these motivation influences on cognition, and introduce the associated 'research nexus' at *Collabra: Psychology*.

Keywords: motivation; cognitive psychology; goal-oriented behavior; emotion; reward

Considering the scope of motivated cognition

Generally, motivation can be defined as goal-oriented behavior, often with the goal of maximizing pleasure and minimizing pain (Berridge, 2004; Hassin et al., 2009; Hughes & Zaki, 2015; Madan, 2013; see Kleinginna Jr. & Kleinginna, 1981, for an overview of different researchers' definitions). As topics within the scope of 'motivated cognition' often are considered more directly, I will first briefly describe a facet of this research area as an example. It is well known that emotion can influence how we attend to the world around us, such as in studies of the weapon-focus effect (Fawcett et al., 2013; Loftus et al., 1987; Steblay, 1992) and flash-bulb memories (Bohn & Berntsen, 2007; Brown & Kulik, 1977; Hirst et al., 2009). These findings lay the foundation for theories such as the attentional narrowing hypothesis (Easterbrook, 1959) and arousal-biased competition hypothesis (Mather & Sutherland, 2011) (though there is also evidence of a role of distinctiveness; Dewhurst & Parry, 2000; Pickel, 1998; Talmi & Moscovitch, 2004). However, a broader view would be to consider emotion-cognition interactions as segment of a more extensive literature on goal-oriented behavior and motivation, a domain-general perspective on the influences of motivational factors on cognition. For instance, rewards have been shown to similarly bias attention allocation, even when using considerably different experimental procedures (Anderson, 2013,

2016a; Awh et al., 2012). This broader view is in-line with recent perspectives on the influence of motivation on cognition (Botvinick & Braver, 2015; Braver et al., 2014; Chiew & Braver, 2011; Cunningham & Brosch, 2012; Gable & Harmon-Jones, 2010; Harmon-Jones et al., 2012a, b; Hughes & Zaki, 2015; Madan, 2013; Murty & Dickerson, 2017; Northoff & Hayes, 2011).

Emotion and reward

Considered broadly, emotion and reward processing bare many commonalities in their influence on cognition. For instance, both can preferentially capture attention (Aarts et al., 2008; Anderson, 2005, 2013, 2016a; Arnell et al., 2007; Bocanegra & Zeelenberg, 2009; MacKay et al., 2004; Raymond & O'Brien, 2009; Strange et al., 2003) and lead to impairments in processing of peripheral information (Anderson, 2013; Anderson & Yantis, 2013; Bucker & Theeuwes, 2017; Dolcos et al., 2011; Kensinger et al., 2007; Talmi, 2013). Moreover, even when allowing for sufficient allocation of attention, both emotion and reward can impair memory for intentionally encoded contextual information (Madan et al., 2012a, 2017a, 2012b; Zimmerman & Kelley, 2010). Emotional arousal is often thought to be the principle dimension (as opposed to valence) (Bradley et al., 2001; Christianson, 1992; Mather & Sutherland, 2011; Talmi, 2013), and there is increasing evidence that 'salience,' an analogous dimension, is important to reward processing (Castel et al., 2016; Kahneman et al., 1993; Litt et al., 2011; Ludvig et al., 2014; Madan et al., 2014; Madan & Spetch, 2012; Tsetsos et al., 2012; Wispinski et al., 2017; Zeigenfuse et al.,

2014). Providing more mechanistic similarities between emotion and reward, both have been shown to relate to autonomic function (e.g., pupil dilation and heart rate) (Abercrombie et al., 2008; Ariel & Castel, 2014; Bijleveld et al., 2009; Bradley et al., 2001, 2008; Buchanan et al., 2006; Fowles et al., 1982; Hochman & Yechiam, 2011; Manohar et al., 2017). Additionally, there are age-related differences in both emotion and reward processing, where older adults are more biased towards positively valenced and gain experiences, than negative/loss experiences (Barber et al., 2016; Carstensen & Mikels, 2005; Castel et al., 2016; Mikels & Reed, 2009; Mikels et al., 2016; Pachur et al., 2017; Samanez Larkin et al., 2007). This parallel may be somewhat exaggerated, however, as emotion and reward are sometimes experimentally operationalized similarly, and thus would produce similar effects in behavior. Specifically, both emotion and reward are often studied using shocks (Bauch et al., 2014; Bisby & Burgess, 2014; Dunsmoor et al., 2015; Jensen et al., 2007; Murty et al., 2012, 2011; Pessoa, 2009; Phelps & LeDoux, 2005; Redondo et al., 2014; Schmidt et al., 2015; Wang et al., 2013; Weiner & Walker, 1966), food (Beaver et al., 2006; de Water et al., 2017; Isen & Geva, 1987; LaBar et al., 2001; Polanía et al., 2015; Talmi et al., 2013; Wadlinger & Isaacowitz, 2006), emotional face pictures (Bradley et al., 1997; Lin et al., 2012; Tsukiura & Cabeza, 2008; Vrijnsen et al., 2013; Vuilleumier & Schwartz, 2001; Woud et al., 2013), or erotic/sexual pictures (Attard-Johnson & Bindemann, 2017; Bradley et al., 2001; Ferrey et al., 2012; Hamann et al., 2004; Igaya et al., 2016; Most et al., 2007; Sescousse et al., 2013a, 2010). As such, it would be expected that both emotion and reward demonstrate similar effects on cognition, as they can be studied using nearly identical experimental designs.

Despite these similarities between how emotion- and reward- processing are studied, there are also a variety of differences. Providing evidence of distinct roles of emotion and reward, when varied within the same experiment, the two factors can produce additive effects (Shigemune et al., 2010) or have otherwise been shown to separably influence behavior (Bennion et al., 2016; Bowen & Spaniol, 2017; Chiew & Braver, 2014; Isen et al., 1988; Mather & Schoeke, 2011; Otto et al., 2016). Emotion is often studied using stimuli that are inherently emotional—words, pictures, sounds, or videos that themselves semantically connote emotional content (Kensinger et al., 2007; MacKay et al., 2004; Madan et al., 2012a, 2017c; Shafer et al., 2012; Shigemune et al., 2010; Strange et al., 2003). In contrast, reward is often implemented as an instructional cue or feedback outcome (Adcock et al., 2006; Castel et al., 2002; Mason et al., 2017; Murayama & Kitagami, 2014; Murty et al., 2012; Pessiglione et al., 2007; Shigemune et al., 2010; Shohamy & Adcock, 2010; Spaniol et al., 2013). Though this dissociation is often true, there are exceptions—such as emotion studies where emotionally neutral stimuli are associated with emotional responses through a similar training task (Mather & Knight, 2008), emotional stimuli are presented just prior to the stimuli of interest (Qiao-Tasserit et al., 2017; Xie & Zhang, 2016, 2017), or with emotional stimuli are used as a feedback

signal (Finn & Roediger, 2011). Similarly, in reward studies, items can be ‘trained’ to have a reward value before the task-of-interest (Anderson, 2013; Madan et al., 2012b; Madan & Spetch, 2012; Raymond & O’Brien, 2009). While a comparison of instructed vs. learned rewards has not been studied directly, there is a parallel with the literature on decisions from uncertainty. Specifically, studies have found differences in people’s risk preferences when decisions are made based on explicitly described odds and outcomes (‘decisions from description’), relative to those based on learned experiences (‘decisions from experience’) (Barron & Erev, 2003; Camilleri & Newell, 2011; Hertwig & Erev, 2009; Jessup et al., 2008; Ludvig et al., 2014; Ludvig & Spetch, 2011; Madan et al., 2017b; Mata et al., 2011; Yoon et al., 2017) (also see Braem et al., 2017).

A particularly interesting consideration when comparing the motivational characteristics of emotion and reward processing is the role of valence—emotional experiences can be either positive or negative (i.e., pleasant or unpleasant), rewards can be either gains or losses (though these could be gains and losses *relative* to expectations, based on either the average outcome or prior experiences). Within their respective literatures, when only one valence is included, it is often the case that only negatively valenced emotional effects are studied, whereas only gain reward outcomes are included. Given the growing literatures demonstrating valence effects in both emotion (Bowen et al., in press; Fredrickson & Branigan, 2005; Gasper & Clore, 2002; Kensinger & Corkin, 2004; Taylor, 1991; Xie & Zhang, 2016) and reward (Jensen et al., 2007; Kahneman & Tversky, 1984; Lejarraga & Hertwig, 2016; Litt et al., 2011; Ludvig et al., 2014; Samanez Larkin et al., 2007) effects on cognition, it is important to be aware of this limitation when only one valence is included in an experimental design. Motivation more generally can also be valenced, as a continuum of approach vs. avoidance motivation (Braver et al., 2014; Gable & Harmon-Jones, 2010; Kaplan et al., 2012; Murty et al., 2011; Vrijnsen et al., 2013; Woud et al., 2013). Critically, this valence dimension of motivation does not directly map onto the valence of emotions or rewards. For instance, both anger and determination can be considered an approach motivation, while fear corresponds with avoidance (Carver & Harmon-Jones, 2009; Harmon-Jones et al., 2011, 2013).

Within the domain of rewards, there are a multitude of forms that a reward can take. Monetary rewards are the most common type of incentive; the use of shocks, and thus the avoidance of punishment, is also used often. However, it is important to consider that other rewards may yield different effects on cognition. Rather than examining these different rewards in isolation, a subset of studies have taken the approach of comparing their effects, or putting them in conflict. For instance, some studies have examined the motivational effects of monetary reward alongside another reward-related stimuli type, such as an appetitive juice reinforcer (Beck et al., 2010; Krug & Braver, 2014; Yee et al., 2016) or pain induction (Delgado et al., 2011; Murty et al., 2011; Read & Loewenstein, 1999; Talmi et al., 2009; Vlaev et al., 2014, 2009; Zhou & Gao, 2008). Other studies use what could

be broadly considered a social reward, such as smiling face (Lin et al., 2012), indicator of social status (Izuma et al., 2008; Zink et al., 2008), or erotic pictures (Iigaya et al., 2016; Sescousse et al., 2013a, b). Additionally, some studies have investigated the motivational role of monetary feedback relative to verbal praise (e.g., “Very well done!”, “Great job!”) (Albrecht et al., 2014; Deci, 1971, 1972; Williams & DeSteno, 2008) though comparisons between reward categories have also been studied (Gross et al., 2014; Roper & Vecera, 2016; Rosati & Hare, 2016).

Other motivational factors

The extent of motivation on cognition is not constrained to emotion and reward. From the current perspective, other factors that lead to selective prioritization of cognitive processes also include the influences of motoric and self-referential processing.

While it is clear that emotion- and reward-related information are preferentially processed and modulate cognitive processes, it is likely less obvious that this may also be true for motor movements. It can be argued that the entire purpose of the brain is to produce movement—the ‘motor chauvinist’ view (Wolpert et al., 2001), a particularly strong perspective within the scope of embodied cognition. While this is an extreme stance, there is evidence that motor processes—such as enacted actions, gestures, and exercise—are beneficial to cognitive processes (Madan & Singhal, 2012b, c). Here motoric processing can be viewed as a type of goal-oriented behavior and in alignment with an approach motivation. A number of more subtle manipulations have demonstrated that cognitive processes can cue motor representations and influence motor movements, and that motor representations can modulate performance in cognitive tasks. For instance, in a simple task involving reaching for blocks and picking them up, grasping kinematics are influenced by text printed on the blocks, such as ‘long’ or ‘short’, as well as by words representing relative large or small objects (e.g., ‘apple’ or ‘grape’) (Gentilucci et al., 2000; Gentilucci & Gangitano, 1998; Glover et al., 2004). In the opposite direction, motor congruency of objects and pictures of objects, such as the side of a handle can influence response time and other measures in cognitive tasks (Brouillet et al., 2015; Buccino et al., 2009; Chum et al., 2007; Handy et al., 2003; Marino et al., 2014; Oakes & Onyper, 2017; Tucker & Ellis, 1998). Even more broadly, words and pictures representing objects varying in functionality can influence attention, semantic processing, and memory (Hauk et al., 2004; Madan et al., 2016; Madan & Singhal, 2012a; Montefinese et al., 2013; Pulvermüller, 2005; Shebani & Pulvermüller, 2013; Tousignant & Pexman, 2012; Witt et al., 2010). These effects are particularly interesting given debates regarding the role of evoked motor functionality information in response to pictures and words, as opposed to physical objects (Skiba & Snow, 2016; Snow et al., 2011, 2014; Squires et al., 2016; Wilson & Golonka, 2013). Taken together, functional objects can also capture attention, interfere with concurrent processes, and elicit approach

motivation responses in ways that share commonalities with emotion and reward processes.

Self-referential processing can also be considered subset of motivated cognition. Unlike emotion-, reward-, and motor-processing, which are properties of the stimuli or how they are attended to, self-relevance is a property of the stimuli’s congruence with the participant. Often self relevance is studied using words that relate to the participant, such as personality trait adjectives (e.g., ‘curious’, ‘stingy’) (Fujiwara et al., 2008; Gutchess et al., 2007; Rogers et al., 1977; Symons & Johnson, 1997; Wentura et al., 2000) or autobiographical words (e.g., hometown, high school) (Gray et al., 2004; Yamawaki et al., in press). In other studies, self relevance is experimentally assigned, such as using sentences that refer to either ‘you’ or another person (Fields & Kuperberg, 2012) or by assigning the ownership of presented objects to the participant or ‘other’ (Cunningham et al., 2008; DeScioli et al., 2015; Truong et al., 2016, 2017). (See Northoff et al., 2006, for a review.) In some ways these two approaches align with the distinction outlined with emotion and reward studies, where the property can either be congruence between self and the stimuli (personality trait adjectives) or implemented as part of the task instructions (assigned ownership). Similar to both emotion and reward, self-referential stimuli can also elicit attentional capture (Alexopoulos et al., 2012; Arnell et al., 1999; Bargh, 1982; Tacikowski & Nowicka, 2010). This is particularly well exemplified by the ‘cocktail party effect,’ where people are able to focus on a particular conversation amidst a variety of concurrent sounds, but can readily and automatically attend to a different conversation if their name is mentioned (Conway et al., 2001; Moray, 1959; Wood & Cowan, 1995). Nonetheless, prior work has demonstrated that the effects of self-referential processing can be dissociated from reward (Northoff & Hayes, 2011) and emotion (Fields & Kuperberg, 2012, 2016; Grilli et al., in press; Kensinger & Gutchess, 2016) processes. In some studies, social cues have been used analogously to rewards, such as trial feedback (Anderson, 2016b, 2017) or in association with other stimuli, such as faces, as a signal for importance (Hargis & Castel, in press). More broadly, it has been shown that people exhibit a bias to pay more attention to pictures of their enemies and incidentally remembered more information about their enemies (Li et al., in press). Along this social dimension, people have also been found to have an ‘own-race bias,’ where people remembered faces of individuals of the same racial background better than those of another race (DeLozier & Rhodes, 2015). To some degree, cultural differences in attention and memory may also be influenced by collective self-referential effects, where cultural background leads to inter-individual differences in how contextual information is prioritized and attended to (Lin & Han, 2009; Masuda & Nisbett, 2001; Millar et al., 2013). In sum, studies of self-referential processing have demonstrated that we have a bias towards stimuli that correspond to ownership or our identity. The design of these self-referential studies share many commonalities with emotion and reward, in operationalization and in their observed influence on

cognitive processing, providing additional support for a domain-general view of motivation-cognition interactions and goal-oriented behavior.

Importantly, the factors discussed thus far are not intended to be an exhaustive list of motivational factors known to influence cognitive processes. Beyond motoric and self-referential processing, numerous other distinct factors can also be construed as being instances of motivated cognition. For instance, people have also been shown to be able to prioritize memory for words representing allergens and medication side-effects that were instructed to be more severe (Friedman et al., 2015; Middlebrooks et al., 2016), similar to prior prioritization studies that used reward values (Castel et al., 2002). It has also been shown in a number of studies that words processed with their survival relevance in-mind are remembered better than in the context of several other instructions (Kang et al., 2008; Nairne & Pandeirada, 2008; Nairne et al., 2008, 2007; Soderstrom & McCabe, 2011; Weinstein et al., 2008). Food stimuli, briefly discussed as being used in both studies of emotion and reward, have also been studied in their own right as a means of probing motivational processes, particularly with interest in time-varying differences in motivation through satiation (Radel & Clément-Guillotin, 2012; Skrynka & Vincent, 2017; Wagner et al., 2012) and other measures of physiological homeostasis (Padulo et al., 2017; Tiedemann et al., 2017).

Conclusion

In sum, it is clear that motivation can guide cognition. These motivational factors—including, but not limited to, emotion and reward processes—modulate behavior across a variety of cognitive domains, often resulting in the prioritized processing of some stimuli. Nonetheless, many of the nuances of these motivation-cognition interactions have yet to be sufficiently understood. One general question is the specificity of these different motivational factors in modulating cognition. For instance, how much of what is known about the effects of emotion on memory can be considered domain-general characteristics of motivational salience and valence, rather than domain-specific effects of emotion? Along these lines, it is clear that emotion and reward, among other factors, necessitate unique research approaches (Gershman & Daw, 2017; Mattek et al., 2017; Panksepp et al., 2017; Schultz, 2015), but it is an open question where the boundaries lie between these different facets of motivation. More broadly, while the position of this perspective paper is that these factors can be summarized as ‘motivational factors’ despite a variety of differences—this is far from conclusive. It is well-established that there are different mechanisms and brain structures associated with these factors, but there nonetheless is a substantive number of commonalities between them as well. My hope is that this perspective article will provide a new lens evaluate existing research and help to inspire further research to better understand how these constructs relate to each other.

Associated with this Perspective article is a new ‘research nexus’ at *Collabra: Psychology*, focused on fostering future research into motivated cognition. Briefly,

a research nexus is similar to a special issue/collection in a journal, but in addition to invited authors and articles, the nexus will remain open for submissions, in order to create a growing collection of articles around the topic. In this newly launched research nexus, we welcome research into any individual motivational factor and their influence on cognition, as well as studies that compare or otherwise investigate the interactions between different motivational factors. While the perspective outlined here is suggestive that nearly all of cognition is motivated, manuscripts submitted to this research nexus must explicitly discuss how their research question and findings inform our understanding of the influence of motivation on cognition. Studies comparing different motivational factors are of particular interest, as this work is ultimately necessary to address open questions regarding the overlap or diversity in how different factors influence cognition.

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Competing Interests

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References

- Aarts, H., Custers, R., & Marien, H. (2008). Preparing and motivating behavior outside of awareness. *Science*, *319*, 1639–1639. DOI: <https://doi.org/10.1126/science.1150432>
- Abercrombie, H. C., Chambers, A. S., Greischar, L., & Monticelli, R. M. (2008). Orienting, emotion, and memory: phasic and tonic variation in heart rate predicts memory for emotional pictures in men. *Neurobiology of Learning and Memory*, *90*, 644–650. DOI: <https://doi.org/10.1016/j.nlm.2008.08.001>
- Adcock, R. A., Thangavel, A., Whitfield-Gabrieli, S., Knutson, B., & Gabrieli, J. D. (2006). Reward-motivated learning: Mesolimbic activation precedes memory formation. *Neuron*, *50*, 507–517. DOI: <https://doi.org/10.1016/j.neuron.2006.03.036>
- Albrecht, K., Abeler, J., Weber, B., & Falk, A. (2014). The brain correlates of the effects of monetary and verbal rewards on intrinsic motivation. *Frontiers in Neuroscience*, *8*, 303. DOI: <https://doi.org/10.3389/fnins.2014.00303>
- Alexopoulos, T., Muller, D., Ric, F., & Marendaz, C. (2012). I, me, mine: Automatic attentional capture by self-related stimuli. *European Journal of Social Psychology*, *42*, 770–779. DOI: <https://doi.org/10.1002/ejsp.1882>
- Anderson, A. K. (2005). Affective influences on the attentional dynamics supporting awareness. *Journal of Experimental Psychology: General*, *134*, 258–281. DOI: <https://doi.org/10.1037/0096-3445.134.2.258>
- Anderson, B. A. (2013). A value-driven mechanism of attentional selection. *Journal of Vision*, *13*, 7–7. DOI: <https://doi.org/10.1167/13.3.7>

- Anderson, B. A.** (2016a). The attention habit: how reward learning shapes attentional selection. *Annals of the New York Academy of Sciences*, 1369, 24–39. DOI: <https://doi.org/10.1111/nyas.12957>
- Anderson, B. A.** (2016b). Social reward shapes attentional biases. *Cognitive Neuroscience*, 7, 30–36. DOI: <https://doi.org/10.1080/17588928.2015.1047823>
- Anderson, B. A.** (2017). Counterintuitive effects of negative social feedback on attention. *Cognition and Emotion*, 31, 590–597. DOI: <https://doi.org/10.1080/02699931.2015.1122576>
- Anderson, B. A., & Yantis, S.** (2013). Persistence of value-driven attentional capture. *Journal of Experimental Psychology: Human Perception and Performance*, 39, 6–9. DOI: <https://doi.org/10.1037/a0030860>
- Ariel, R., & Castel, A. D.** (2014). Eyes wide open: enhanced pupil dilation when selectively studying important information. *Experimental Brain Research*, 232, 337–344. DOI: <https://doi.org/10.1007/s00221-013-3744-5>
- Arnell, K. M., Killman, K. V., & Fijavz, D.** (2007). Blinded by emotion: Target misses follow attention capture by arousing distractors in RSVP. *Emotion*, 7, 465–477. DOI: <https://doi.org/10.1037/1528-3542.7.3.465>
- Arnell, K. M., Shapiro, K. L., & Sorensen, R. E.** (1999). Reduced repetition blindness for one's own name. *Visual Cognition*, 6, 609–635. DOI: <https://doi.org/10.1080/135062899394876>
- Attard-Johnson, J., & Bindemann, M.** (2017). Sex-specific but not sexually explicit: pupillary responses to dressed and naked adults. *Royal Society Open Science*, 4, 160963. DOI: <https://doi.org/10.1098/rsos.160963>
- Awh, E., Belopolsky, A. V., & Theeuwes, J.** (2012). Top-down versus bottom-up attentional control: a failed theoretical dichotomy. *Trends in Cognitive Sciences*, 16, 437–443. DOI: <https://doi.org/10.1016/j.tics.2012.06.010>
- Barber, S. J., Opitz, P. C., Martins, B., Sakaki, M., & Mather, M.** (2016). Thinking about a limited future enhances the positivity of younger and older adults' recall: Support for socioemotional selectivity theory. *Memory & Cognition*, 44, 869–882. DOI: <https://doi.org/10.3758/s13421-016-0612-0>
- Bargh, J. A.** (1982). Attention and automaticity in the processing of self-relevant information. *Journal of Personality and Social Psychology*, 43, 425–436. DOI: <https://doi.org/10.1037/0022-3514.43.3.425>
- Barron, G., & Erev, I.** (2003). Small feedback-based decisions and their limited correspondence to description-based decisions. *Journal of Behavioral Decision Making*, 16, 215–233. DOI: <https://doi.org/10.1002/bdm.443>
- Bauch, E. M., Rausch, V. H., & Bunzeck, N.** (2014). Pain anticipation recruits the mesolimbic system and differentially modulates subsequent recognition memory. *Human Brain Mapping*, 35, 4594–4606. DOI: <https://doi.org/10.1002/hbm.22497>
- Beaver, J. D., Lawrence, A. D., van Ditzhuijzen, J., Davis, M. H., Woods, A., & Calder, A. J.** (2006). Individual differences in reward drive predict neural responses to images of food. *Journal of Neuroscience*, 26, 5160–5166. DOI: <https://doi.org/10.1523/JNEUROSCI.0350-06.2006>
- Beck, S. M., Locke, H. S., Savine, A. C., Jimura, K., & Braver, T. S.** (2010). Primary and secondary rewards differentially modulate neural activity dynamics during working memory. *PLoS ONE*, 5, e9251. DOI: <https://doi.org/10.1371/journal.pone.0009251>
- Bennion, K. A., Payne, J. D., & Kensinger, E. A.** (2016). The impact of napping on memory for future-relevant stimuli: Prioritization among multiple salience cues. *Behavioral Neuroscience*, 130, 281–289. DOI: <https://doi.org/10.1037/bne0000142>
- Berridge, K. C.** (2004). Motivation concepts in behavioral neuroscience. *Physiology & Behavior*, 81, 179–209. DOI: <https://doi.org/10.1016/j.physbeh.2004.02.004>
- Bijleveld, E., Custers, R., & Aarts, H.** (2009). The unconscious eye opener. *Psychological Science*, 20, 1313–1315. DOI: <https://doi.org/10.1111/j.1467-9280.2009.02443.x>
- Bisby, J. A., & Burgess, N.** (2014). Negative affect impairs associative memory but not item memory. *Learning & Memory*, 21, 760–766. DOI: <https://doi.org/10.1101/lm.032409.113>
- Bocanegra, B. R., & Zeelenberg, R.** (2009). Dissociating emotion-induced blindness and hypervision. *Emotion*, 9, 865–873. DOI: <https://doi.org/10.1037/a0017749>
- Bohn, A., & Berntsen, D.** (2007). Pleasantness bias in flashbulb memories: Positive and negative flashbulb memories of the fall of the berlin wall among east and west germans. *Memory & Cognition*, 35, 565–577. DOI: <https://doi.org/10.3758/BF03193295>
- Botvinick, M., & Braver, T.** (2015). Motivation and cognitive control: From behavior to neural mechanism. *Annual Review of Psychology*, 66, 83–113. DOI: <https://doi.org/10.1146/annurev-psych-010814-015044>
- Bowen, H. J., Kark, S. M., & Kensinger, E. A.** (in press). NEVER forget: negative emotional valence enhances recapitulation. *Psychonomic Bulletin & Review*. DOI: <https://doi.org/10.3758/s13423-017-1313-9>
- Bowen, H. J., & Spaniol, J.** (2017). Effects of emotion and motivation on memory dissociate in the context of losses. *Learning and Motivation*, 58, 77–87. DOI: <https://doi.org/10.1016/j.lmot.2017.05.003>
- Bradley, B. P., Mogg, K., Millar, N., Bonham-Carter, C., Fergusson, E., Jenkins, J., & Parr, M.** (1997). Attentional biases for emotional faces. *Cognition & Emotion*, 11, 25–42. DOI: <https://doi.org/10.1080/026999397380014>
- Bradley, M. M., Codispoti, M., Cuthbert, B. N., & Lang, P. J.** (2001). Emotion and motivation I: Defensive and appetitive reactions in picture processing. *Emotion*, 1, 276–298. DOI: <https://doi.org/10.1037/1528-3542.1.3.276>
- Bradley, M. M., Miccoli, L., Escrig, M. A., & Lang, P. J.** (2008). The pupil as a measure of emotional arousal and autonomic activation. *Psychophysiology*, 45, 602–607. DOI: <https://doi.org/10.1111/j.1469-8986.2008.00654.x>

- Braem, S., Houwer, J. D., Demanet, J., Yuen, K. S., Kalisch, R., & Brass, M.** (2017). Pattern analyses reveal separate experience based fear memories in the human right amygdala. *The Journal of Neuroscience*, *37*, 8116–8130. DOI: <https://doi.org/10.1523/JNEUROSCI.0908-17.2017>
- Braver, T. S., Krug, M. K., Chiew, K. S., Kool, W., Westbrook, J. A., Clement, N. J., Adcock, R. A., Barch, D. M., Botvinick, M. M., Carver, C. S., Cools, R., Custers, R., Dickinson, A., Dweck, C. S., Fishbach, A., Gollwitzer, P. M., Hess, T. M., Isaacowitz, D. M., Mather, M., Murayama, K., Pessoa, L., Samanez-Larkin, G. R., & Somerville, L. H.** (2014). Mechanisms of motivation–cognition interaction: challenges and opportunities. *Cognitive, Affective, & Behavioral Neuroscience*, *14*, 443–472. DOI: <https://doi.org/10.3758/s13415-014-0300-0>
- Brouillet, D., Brouillet, T., Milhau, A., Heurley, L., Vagnot, C., & Brunel, L.** (2015). Word-to-picture recognition is a function of motor components mappings at the stage of retrieval. *International Journal of Psychology*, *51*, 397–402. DOI: <https://doi.org/10.1002/ijop.12210>
- Brown, R., & Kulik, J.** (1977). Flashbulb memories. *Cognition*, *5*, 73–99. DOI: [https://doi.org/10.1016/0010-0277\(77\)90018-X](https://doi.org/10.1016/0010-0277(77)90018-X)
- Buccino, G., Sato, M., Cattaneo, L., Rodà, F., & Riggio, L.** (2009). Broken affordances, broken objects: A TMS study. *Neuropsychologia*, *47*, 3074–3078. DOI: <https://doi.org/10.1016/j.neuropsychologia.2009.07.003>
- Buchanan, T. W., Etzel, J. A., Adolphs, R., & Tranel, D.** (2006). The influence of autonomic arousal and semantic relatedness on memory for emotional words. *International Journal of Psychophysiology*, *61*, 26–33. DOI: <https://doi.org/10.1016/j.ijpsycho.2005.10.022>
- Bucker, B., & Theeuwes, J.** (2017). Pavlovian reward learning underlies value driven attentional capture. *Attention, Perception, & Psychophysics*, *79*, 415–428. DOI: <https://doi.org/10.3758/s13414-016-1241-1>
- Camilleri, A. R., & Newell, B. R.** (2011). When and why rare events are underweighted: A direct comparison of the sampling, partial feedback, full feedback and description choice paradigms. *Psychonomic Bulletin & Review*, *18*, 377–384. DOI: <https://doi.org/10.3758/s13423-010-0040-2>
- Carstensen, L. L., & Mikels, J. A.** (2005). At the intersection of emotion and cognition. *Current Directions in Psychological Science*, *14*, 117–121. DOI: <https://doi.org/10.1111/j.0963-7214.2005.00348.x>
- Carver, C. S., & Harmon-Jones, E.** (2009). Anger is an approach-related affect: Evidence and implications. *Psychological Bulletin*, *135*, 183–204. DOI: <https://doi.org/10.1037/a0013965>
- Castel, A. D., Benjamin, A. S., Craik, F. I. M., & Watkins, M. J.** (2002). The effects of aging on selectivity and control in short-term recall. *Memory & Cognition*, *30*, 1078–1085. DOI: <https://doi.org/10.3758/BF03194325>
- Castel, A. D., Friedman, M. C., McGillivray, S., Flores, C. C., Murayama, K., Kerr, T., & Drolet, A.** (2016). I owe you: age-related similarities and differences in associative memory for gains and losses. *Aging, Neuropsychology, and Cognition*, *23*, 549–565. DOI: <https://doi.org/10.1080/13825585.2015.1130214>
- Chiew, K. S., & Braver, T. S.** (2011). Positive affect versus reward: Emotional and motivational influences on cognitive control. *Frontiers in Psychology*, *2*, 279. DOI: <https://doi.org/10.3389/fpsyg.2011.00279>
- Chiew, K. S., & Braver, T. S.** (2014). Dissociable influences of reward motivation and positive emotion on cognitive control. *Cognitive, Affective, & Behavioral Neuroscience*, *14*, 509–529. DOI: <https://doi.org/10.3758/s13415-014-0280-0>
- Christianson, S.-Å.** (1992). Emotional stress and eyewitness memory: A critical review. *Psychological Bulletin*, *112*, 284–309. DOI: <https://doi.org/10.1037/0033-2909.112.2.284>
- Chum, M., Bekkering, H., Dodd, M. D., & Pratt, J.** (2007). Motor and visual codes interact to facilitate visuospatial memory performance. *Psychonomic Bulletin & Review*, *14*, 1189–1193. DOI: <https://doi.org/10.3758/BF03193111>
- Conway, A. R. A., Cowan, N., & Bunting, M. F.** (2001). The cocktail party phenomenon revisited: The importance of working memory capacity. *Psychonomic Bulletin & Review*, *8*, 331–335. DOI: <https://doi.org/10.3758/BF03196169>
- Cunningham, S. J., Turk, D. J., Macdonald, L. M., & Macrae, C. N.** (2008). Yours or mine? ownership and memory. *Consciousness and Cognition*, *17*, 312–318. DOI: <https://doi.org/10.1016/j.concog.2007.04.003>
- Cunningham, W. A., & Brosch, T.** (2012). Motivational salience: Amygdala tuning from traits, needs, values, and goals. *Current Directions in Psychological Science*, *21*, 54–59. DOI: <https://doi.org/10.1177/0963721411430832>
- Deci, E. L.** (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*, *18*, 105–115. DOI: <https://doi.org/10.1037/h0030644>
- Deci, E. L.** (1972). The effects of contingent and noncontingent rewards and controls on intrinsic motivation. *Organizational Behavior and Human Performance*, *8*, 217–229. DOI: [https://doi.org/10.1016/0030-5073\(72\)90047-5](https://doi.org/10.1016/0030-5073(72)90047-5)
- Delgado, M. R., Jou, R. L., & Phelps, E. A.** (2011). Neural systems underlying aversive conditioning in humans with primary and secondary reinforcers. *Frontiers in Neuroscience*, *5*, 71. DOI: <https://doi.org/10.3389/fnins.2011.00071>
- DeLozier, S., & Rhodes, M. G.** (2015). The impact of value-directed remembering on the own-race bias. *Acta Psychologica*, *154*, 62–68. DOI: <https://doi.org/10.1016/j.actpsy.2014.11.009>
- DeScioli, P., Rosa, N. M., & Gutchess, A. H.** (2015). A memory advantage for property. *Evolutionary Psychology*, *13*, 411–423. DOI: <https://doi.org/10.1177/147470491501300205>

- de Water, E., Mies, G. W., Figner, B., Yoncheva, Y., van den Bos, W., Castellanos, F. X., Cillessen, A. H. N., & Scheres, A.** (2017). Neural mechanisms of individual differences in temporal discounting of monetary and primary rewards in adolescents. *NeuroImage*, *153*, 198–210. DOI: <https://doi.org/10.1016/j.neuroimage.2017.04.013>
- Dewhurst, S. A., & Parry, L. A.** (2000). Emotionality, distinctiveness, and recollective experience. *European Journal of Cognitive Psychology*, *12*, 541–551. DOI: <https://doi.org/10.1080/095414400750050222>
- Dolcos, F., Iordan, A. D., & Dolcos, S.** (2011). Neural correlates of emotion–cognition interactions: A review of evidence from brain imaging investigations. *Journal of Cognitive Psychology*, *23*, 669–694. DOI: <https://doi.org/10.1080/20445911.2011.594433>
- Dunsmoor, J. E., Murty, V. P., Davachi, L., & Phelps, E. A.** (2015). Emotional learning selectively and retroactively strengthens memories for related events. *Nature*, *520*, 345–348. DOI: <https://doi.org/10.1038/nature14106>
- Easterbrook, J. A.** (1959). The effect of emotion on cue utilization and the organization of behavior. *Psychological Review*, *66*, 183–201. DOI: <https://doi.org/10.1037/h0047707>
- Fawcett, J. M., Russell, E. J., Peace, K. A., & Christie, J.** (2013). Of guns and geese: a meta-analytic review of the ‘weapon focus’ literature. *Psychology, Crime & Law*, *19*, 35–66. DOI: <https://doi.org/10.1080/1068316X.2011.599325>
- Ferrey, A. E., Frischen, A., & Fenske, M. J.** (2012). Hot or not: Response inhibition reduces the hedonic value and motivational incentive of sexual stimuli. *Frontiers in Psychology*, *3*, 575. DOI: <https://doi.org/10.3389/fpsyg.2012.00575>
- Fields, E. C., & Kuperberg, G. R.** (2012). It’s all about you: An ERP study of emotion and self-relevance in discourse. *NeuroImage*, *62*, 562–574. DOI: <https://doi.org/10.1016/j.neuroimage.2012.05.003>
- Fields, E. C., & Kuperberg, G. R.** (2016). Dynamic effects of self-relevance and task on the neural processing of emotional words in context. *Frontiers in Psychology*, *6*, 2003. DOI: <https://doi.org/10.3389/fpsyg.2015.02003>
- Finn, B., & Roediger, H. L.** (2011). Enhancing retention through reconsolidation. *Psychological Science*, *22*, 781–786. DOI: <https://doi.org/10.1177/0956797611407932>
- Fowles, D. C., Fisher, A. E., & Tranel, D. T.** (1982). The heart beats to reward: The effect of monetary incentive on heart rate. *Psychophysiology*, *19*, 506–513. DOI: <https://doi.org/10.1111/j.1469-8986.1982.tb02577.x>
- Fredrickson, B. L., & Branigan, C.** (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition & Emotion*, *19*, 313–332. DOI: <https://doi.org/10.1080/02699930441000238>
- Friedman, M. C., McGillivray, S., Murayama, K., & Castel, A. D.** (2015). Memory for medication side effects in younger and older adults: The role of subjective and objective importance. *Memory & Cognition*, *43*, 206–215. DOI: <https://doi.org/10.3758/s13421-014-0476-0>
- Fujiwara, E., Levine, B., & Anderson, A. K.** (2008). Intact implicit and reduced explicit memory for negative self-related information in repressive coping. *Cognitive, Affective, & Behavioral Neuroscience*, *8*, 254–263. DOI: <https://doi.org/10.3758/CABN.8.3.254>
- Gable, P., & Harmon-Jones, E.** (2010). The motivational dimensional model of affect: Implications for breadth of attention, memory, and cognitive categorisation. *Cognition & Emotion*, *24*, 322–337. DOI: <https://doi.org/10.1080/02699930903378305>
- Gasper, K., & Clore, G. L.** (2002). Attending to the big picture: Mood and global versus local processing of visual information. *Psychological Science*, *13*, 34–40. DOI: <https://doi.org/10.1111/1467-9280.00406>
- Gentilucci, M., Benuzzi, F., Bertolani, L., Daprati, E., & Gangitano, M.** (2000). Language and motor control. *Experimental Brain Research*, *133*, 468–490. DOI: <https://doi.org/10.1007/s002210000431>
- Gentilucci, M., & Gangitano, M.** (1998). Influence of automatic word reading on motor control. *European Journal of Neuroscience*, *10*, 752–756. DOI: <https://doi.org/10.1046/j.1460-9568.1998.00060.x>
- Gershman, S. J., & Daw, N. D.** (2017). Reinforcement learning and episodic memory in humans and animals: An integrative framework. *Annual Review of Psychology*, *68*, 101–128. DOI: <https://doi.org/10.1146/annurev-psych-122414-033625>
- Glover, S., Rosenbaum, D. A., Graham, J., & Dixon, P.** (2004). Grasping the meaning of words. *Experimental Brain Research*, *154*, 103–108. DOI: <https://doi.org/10.1007/s00221-003-1659-2>
- Gray, H. M., Ambady, N., Lowenthal, W. T., & Deldin, P.** (2004). P300 as an index of attention to self-relevant stimuli. *Journal of Experimental Social Psychology*, *40*, 216–224. DOI: [https://doi.org/10.1016/S0022-1031\(03\)00092-1](https://doi.org/10.1016/S0022-1031(03)00092-1)
- Grilli, M. D., Woolverton, C. B., Crawford, M., & Glisky, E. L.** (in press). Self-reference and emotional memory effects in older adults at increased genetic risk of alzheimer’s disease. *Aging, Neuropsychology, and Cognition*. DOI: <https://doi.org/10.1080/13825585.2016.1275508>
- Gross, J., Woelbert, E., Zimmermann, J., Okamoto-Barth, S., Riedl, A., & Goebel, R.** (2014). Value signals in the prefrontal cortex predict individual preferences across reward categories. *Journal of Neuroscience*, *34*, 7580–7586. DOI: <https://doi.org/10.1523/JNEUROSCI.5082-13.2014>
- Gutchess, A. H., Kensinger, E. A., Yoon, C., & Schacter, D. L.** (2007). Ageing and the self-reference effect in memory. *Memory*, *15*, 822–837. DOI: <https://doi.org/10.1080/09658210701701394>
- Hamann, S., Herman, R. A., Nolan, C. L., & Wallen, K.** (2004). Men and women differ in amygdala response to visual sexual stimuli. *Nature Neuroscience*, *7*, 411–416. DOI: <https://doi.org/10.1038/nn1208>
- Handy, T. C., Grafton, S. T., Shroff, N. M., Ketay, S., & Gazzaniga, M. S.** (2003). Graspable objects grab

- attention when the potential for action is recognized. *Nature Neuroscience*, *6*, 421–427. DOI: <https://doi.org/10.1038/nn1031>
- Hargis, M. B., & Castel, A. D.** (in press). Younger and older adults' associative memory for social information: The role of information importance. *Psychology and Aging*, *32*, 325–330. DOI: <https://doi.org/10.1037/pag0000171>
- Harmon-Jones, C., Schmeichel, B. J., Mennitt, E., & Harmon-Jones, E.** (2011). The expression of determination: Similarities between anger and approach-related positive affect. *Journal of Personality and Social Psychology*, *100*, 172–181. DOI: <https://doi.org/10.1037/a0020966>
- Harmon-Jones, E., Gable, P. A., & Price, T. F.** (2012a). The influence of affective states varying in motivational intensity on cognitive scope. *Frontiers in Integrative Neuroscience*, *6*. DOI: <https://doi.org/10.3389/fnint.2012.00073>
- Harmon-Jones, E., Gable, P. A., & Price, T. F.** (2012b). The influence of affective states on cognitive broadening/narrowing: Considering the importance of motivational intensity. *Social and Personality Psychology Compass*, *6*, 314–327. DOI: <https://doi.org/10.1111/j.1751-9004.2012.00432.x>
- Harmon-Jones, E., Gable, P. A., & Price, T. F.** (2013). Does negative affect always narrow and positive affect always broaden the mind? considering the influence of motivational intensity on cognitive scope. *Current Directions in Psychological Science*, *22*, 301–307. DOI: <https://doi.org/10.1177/0963721413481353>
- Hassin, R. R., Aarts, H., Eitam, B., Custers, R., & Kleiman, T.** (2009). Non-conscious goal pursuit and the effortful control of behavior. In: *Oxford handbook of human action*, 549–566. New York: Oxford University Press.
- Hauk, O., Johnsrude, I., & Pulvermüller, F.** (2004). Somatotopic representation of action words in human motor and premotor cortex. *Neuron*, *41*, 301–307. DOI: [https://doi.org/10.1016/S0896-6273\(03\)00838-9](https://doi.org/10.1016/S0896-6273(03)00838-9)
- Hertwig, R., & Erev, I.** (2009). The description–experience gap in risky choice. *Trends in Cognitive Sciences*, *13*, 517–523. DOI: <https://doi.org/10.1016/j.tics.2009.09.004>
- Hirst, W., Phelps, E. A., Buckner, R. L., Budson, A. E., Cuc, A., Gabrieli, J. D. E., Johnson, M. K., Lustig, C., Lyle, K. B., Mather, M., Meksin, R., Mitchell, K. J., Ochsner, K. N., Schacter, D. L., Simons, J. S., & Vaidya, C. J.** (2009). Long-term memory for the terrorist attack of september 11: Flashbulb memories, event memories, and the factors that influence their retention. *Journal of Experimental Psychology: General*, *138*, 161–176. DOI: <https://doi.org/10.1037/a0015527>
- Hochman, G., & Yechiam, E.** (2011). Loss aversion in the eye and in the heart: The autonomic nervous system's responses to losses. *Journal of Behavioral Decision Making*, *24*, 140–156. DOI: <https://doi.org/10.1002/bdm.692>
- Hughes, B. L., & Zaki, J.** (2015). The neuroscience of motivated cognition. *Trends in Cognitive Sciences*, *19*, 62–64. DOI: <https://doi.org/10.1016/j.tics.2014.12.006>
- Igaya, K., Story, G. W., Kurth-Nelson, Z., Dolan, R. J., & Dayan, P.** (2016). The modulation of savouring by prediction error and its effects on choice. *eLife*, *5*, e13747. DOI: <https://doi.org/10.7554/eLife.13747>
- Isen, A. M., & Geva, N.** (1987). The influence of positive affect on acceptable level of risk: The person with a large canoe has a large worry. *Organizational Behavior and Human Decision Processes*, *39*, 145–154. DOI: [https://doi.org/10.1016/0749-5978\(87\)90034-3](https://doi.org/10.1016/0749-5978(87)90034-3)
- Isen, A. M., Nygren, T. E., & Ashby, F. G.** (1988). Influence of positive affect on the subjective utility of gains and losses: It is just not worth the risk. *Journal of Personality and Social Psychology*, *55*, 710–717. DOI: <https://doi.org/10.1037/0022-3514.55.5.710>
- Izuma, K., Saito, D. N., & Sadato, N.** (2008). Processing of social and monetary rewards in the human striatum. *Neuron*, *58*, 284–294. DOI: <https://doi.org/10.1016/j.neuron.2008.03.020>
- Jensen, J., Smith, A. J., Willeit, M., Crawley, A. P., Mikulis, D. J., Vitcu, I., & Kapur, S.** (2007). Separate brain regions code for salience vs. valence during reward prediction in humans. *Human Brain Mapping*, *28*, 294–302. DOI: <https://doi.org/10.1002/hbm.20274>
- Jessup, R. K., Bishara, A. J., & Busemeyer, J. R.** (2008). Feedback produces divergence from prospect theory in descriptive choice. *Psychological Science*, *19*, 1015–1022. DOI: <https://doi.org/10.1111/j.1467-9280.2008.02193.x>
- Kahneman, D., Fredrickson, B. L., Schreiber, C. A., & Redelmeier, D. A.** (1993). When more pain is preferred to less: Adding a better end. *Psychological Science*, *4*, 401–405. DOI: <https://doi.org/10.1111/j.1467-9280.1993.tb00589.x>
- Kahneman, D., & Tversky, A.** (1984). Choices, values, and frames. *American Psychologist*, *39*, 341–350. DOI: <https://doi.org/10.1037/0003-066X.39.4.341>
- Kang, S. H. K., McDermott, K. B., & Cohen, S. M.** (2008). The mnemonic advantage of processing fitness-relevant information. *Memory & Cognition*, *36*, 1151–1156. DOI: <https://doi.org/10.3758/MC.36.6.1151>
- Kaplan, R. L., Damme, I. V., & Levine, L. J.** (2012). Motivation matters: Differing effects of pre-goal and post-goal emotions on attention and memory. *Frontiers in Psychology*, *3*. DOI: <https://doi.org/10.3389/fpsyg.2012.00404>
- Kensinger, E. A., & Corkin, S.** (2004). Two routes to emotional memory: Distinct neural processes for valence and arousal. *Proceedings of the National Academy of Sciences*, *101*, 3310–3315. DOI: <https://doi.org/10.1073/pnas.0306408101>
- Kensinger, E. A., Garoff-Eaton, R. J., & Schacter, D. L.** (2007). Effects of emotion on memory specificity: Memory trade-offs elicited by negative visually arousing stimuli. *Journal of Memory*

- and Language*, 56, 575–591. DOI: <https://doi.org/10.1016/j.jml.2006.05.004>
- Kensinger, E. A., & Gutchess, A. H.** (2016). Cognitive aging in a social and affective context: Advances over the past 50 years. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 72, 61–70. DOI: <https://doi.org/10.1093/geronb/gbw056>
- Kleinginna, P. R., Jr., & Kleinginna, A. M.** (1981). A categorized list of motivation definitions, with a suggestion for a consensual definition. *Motivation and Emotion*, 5, 263–291. DOI: <https://doi.org/10.1007/BF00993889>
- Krug, M. K., & Braver, T. S.** (2014). Motivation and cognitive control: Going beyond monetary incentives. In *The Psychological Science of Money*, 137–162. Springer. DOI: https://doi.org/10.1007/978-1-4939-0959-9_7
- LaBar, K. S., Gitelman, D. R., Parrish, T. B., Kim, Y.-H., Nobre, A. C., & Mesulam, M.-M.** (2001). Hunger selectively modulates corticolimbic activation to food stimuli in humans. *Behavioral Neuroscience*, 115, 493–500. DOI: <https://doi.org/10.1037/0735-7044.115.2.493>
- Lejarraga, T., & Hertwig, R.** (2016). How the threat of losses makes people explore more than the promise of gains. *Psychonomic Bulletin & Review*, 24, 708–720. DOI: <https://doi.org/10.3758/s13423-016-1158-7>
- Li, L. M. W., Masuda, T., & Lee, H.** (in press). Low relational mobility leads to greater motivation to understand enemies but not friends and acquaintances. *British Journal of Social Psychology*. DOI: <https://doi.org/10.1111/bjso.12216>
- Lin, A., Adolphs, R., & Rangel, A.** (2012). Social and monetary reward learning engage overlapping neural substrates. *Social Cognitive and Affective Neuroscience*, 7, 274–281. DOI: <https://doi.org/10.1093/scan/nsr006>
- Lin, Z., & Han, S.** (2009). Self-construal priming modulates the scope of visual attention. *Quarterly Journal of Experimental Psychology*, 62, 802–813. DOI: <https://doi.org/10.1080/17470210802271650>
- Litt, A., Plassmann, H., Shiv, B., & Rangel, A.** (2011). Dissociating valuation and saliency signals during decision-making. *Cerebral Cortex*, 21, 95–102. DOI: <https://doi.org/10.1093/cercor/bhq065>
- Loftus, E. F., Loftus, G. R., & Messo, J.** (1987). Some facts about “weapon focus”. *Law and Human Behavior*, 11, 55–62. DOI: <https://doi.org/10.1007/BF01044839>
- Ludvig, E. A., Madan, C. R., & Spetch, M. L.** (2014). Extreme outcomes sway risky decisions from experience. *Journal of Behavioral Decision Making*, 27, 146–156. DOI: <https://doi.org/10.1002/bdm.1792>
- Ludvig, E. A., & Spetch, M. L.** (2011). Of black swans and tossed coins: Is the description-experience gap in risky choice limited to rare events? *PLoS ONE*, 6, e20262. DOI: <https://doi.org/10.1371/journal.pone.0020262>
- MacKay, D. G., Shafto, M., Taylor, J. K., Marian, D. E., Abrams, L., & Dyer, J. R.** (2004). Relations between emotion, memory, and attention: Evidence from taboo Stroop, lexical decision, and immediate memory tasks. *Memory & Cognition*, 32, 474–488. DOI: <https://doi.org/10.3758/BF03195840>
- Madan, C. R.** (2013). Toward a common theory for learning from reward, affect, and motivation: the SIMON framework. *Frontiers in Systems Neuroscience*, 7. DOI: <https://doi.org/10.3389/fnsys.2013.00059>
- Madan, C. R., Caplan, J. B., Lau, C. S., & Fujiwara, E.** (2012a). Emotional arousal does not enhance association-memory. *Journal of Memory and Language*, 66, 695–716. DOI: <https://doi.org/10.1016/j.jml.2012.04.001>
- Madan, C. R., Chen, Y. Y., & Singhal, A.** (2016). ERPs differentially reflect automatic and deliberate processing of the functional manipulability of objects. *Frontiers in Human Neuroscience*, 10. DOI: <https://doi.org/10.3389/fnhum.2016.00360>
- Madan, C. R., Fujiwara, E., Caplan, J. B., & Sommer, T.** (2017a). Emotional arousal impairs association-memory: Roles of amygdala and hippocampus. *NeuroImage*, 156, 14–28. DOI: <https://doi.org/10.1016/j.neuroimage.2017.04.065>
- Madan, C. R., Fujiwara, E., Gerson, B. C., & Caplan, J. B.** (2012b). High reward makes items easier to remember, but harder to bind to a new temporal context. *Frontiers in Integrative Neuroscience*, 6. DOI: <https://doi.org/10.3389/fnint.2012.00061>
- Madan, C. R., Ludvig, E. A., & Spetch, M. L.** (2014). Remembering the best and worst of times: Memories for extreme outcomes bias risky decisions. *Psychonomic Bulletin & Review*, 21, 629–636. DOI: <https://doi.org/10.3758/s13423-013-0542-9>
- Madan, C. R., Ludvig, E. A., & Spetch, M. L.** (2017b). The role of memory in distinguishing risky decisions from experience and description. *Quarterly Journal of Experimental Psychology*, 70, 2048–2059. DOI: <https://doi.org/10.1080/17470218.2016.1220608>
- Madan, C. R., Shafer, A. T., Chan, M., & Singhal, A.** (2017c). Shock and awe: Distinct effects of taboo words on lexical decision and free recall. *Quarterly Journal of Experimental Psychology*, 70, 793–810. DOI: <https://doi.org/10.1080/17470218.2016.1167925>
- Madan, C. R., & Singhal, A.** (2012a). Encoding the world around us: Motor-related processing influences verbal memory. *Consciousness and Cognition*, 21, 1563–1570. DOI: <https://doi.org/10.1016/j.concog.2012.07.006>
- Madan, C. R., & Singhal, A.** (2012b). Motor imagery and higher-level cognition: four hurdles before research can sprint forward. *Cognitive Processing*, 13, 211–229. DOI: <https://doi.org/10.1007/s10339-012-0438-z>
- Madan, C. R., & Singhal, A.** (2012c). Using actions to enhance memory: effects of enactment, gestures, and exercise on human memory. *Frontiers in Psychology*, 3. DOI: <https://doi.org/10.3389/fpsyg.2012.00507>
- Madan, C. R., & Spetch, M. L.** (2012). Is the enhancement of memory due to reward driven by value or salience? *Acta Psychologica*, 139, 343–349. DOI: <https://doi.org/10.1016/j.actpsy.2011.12.010>
- Manohar, S. G., Finzi, R. D., Drew, D., & Husain, M.** (2017). Distinct motivational effects of contingent

- and noncontingent rewards. *Psychological Science*, 28, 1016–1026. DOI: <https://doi.org/10.1177/0956797617693326>
- Marino, B. F. M., Sirianni, M., Volta, R. D., Magliocco, F., Silipo, F., Quattrone, A., & Buccino, G.** (2014). Viewing photos and reading nouns of natural graspable objects similarly modulate motor responses. *Frontiers in Human Neuroscience*, 8. DOI: <https://doi.org/10.3389/fnhum.2014.00968>
- Mason, A., Farrell, S., Howard-Jones, P., & Ludwig, C. J.** (2017). The role of reward and reward uncertainty in episodic memory. *Journal of Memory and Language*, 96, 62–77. DOI: <https://doi.org/10.1016/j.jml.2017.05.003>
- Masuda, T., & Nisbett, R. E.** (2001). Attending holistically versus analytically: Comparing the context sensitivity of Japanese and Americans. *Journal of Personality and Social Psychology*, 81, 922–934. DOI: <https://doi.org/10.1037/0022-3514.81.5.922>
- Mata, R., Josef, A. K., Samanez-Larkin, G. R., & Hertwig, R.** (2011). Age differences in risky choice: a meta-analysis. *Annals of the New York Academy of Sciences*, 1235, 18–29. DOI: <https://doi.org/10.1111/j.1749-6632.2011.06200.x>
- Mather, M., & Knight, M.** (2008). The emotional harbinger effect: Poor context memory for cues that previously predicted something arousing. *Emotion*, 8, 850–860. DOI: <https://doi.org/10.1037/a0014087>
- Mather, M., & Schoeke, A.** (2011). Positive outcomes enhance incidental learning for both younger and older adults. *Frontiers in Neuroscience*, 5. DOI: <https://doi.org/10.3389/fnins.2011.00129>
- Mather, M., & Sutherland, M. R.** (2011). Arousal-biased competition in perception and memory. *Perspectives on Psychological Science*, 6, 114–133. DOI: <https://doi.org/10.1177/1745691611400234>
- Mattek, A. M., Wolford, G. L., & Whalen, P. J.** (2017). A mathematical model captures the structure of subjective affect. *Perspectives on Psychological Science*, 12, 508–526. DOI: <https://doi.org/10.1177/1745691616685863>
- Middlebrooks, C. D., McGillivray, S., Murayama, K., & Castel, A. D.** (2016). Memory for allergies and health foods: How younger and older adults strategically remember critical health information. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 71, 389–399. DOI: <https://doi.org/10.1093/geronb/gbv032>
- Mikels, J. A., & Reed, A. E.** (2009). Monetary losses do not loom large in later life: Age differences in the framing effect. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 64B, 457–460. DOI: <https://doi.org/10.1093/geronb/gbp043>
- Mikels, J. A., Shuster, M. M., Thai, S. T., Smith-Ray, R., Waugh, C. E., Roth, K., Keilly, A., & Stine-Morrow, E. A. L.** (2016). Messages that matter: Age differences in affective responses to framed health messages. *Psychology and Aging*, 31, 409–414. DOI: <https://doi.org/10.1037/pag0000040>
- Millar, P. R., Serbun, S. J., Vadalia, A., & Gutches, A. H.** (2013). Cross-cultural differences in memory specificity. *Culture and Brain*, 1, 138–157. DOI: <https://doi.org/10.1007/s40167-013-0011-3>
- Montefinese, M., Ambrosini, E., Fairfield, B., & Mammarella, N.** (2013). The 'subjective' pupil old/new effect: Is the truth plain to see? *International Journal of Psychophysiology*, 89, 48–56. DOI: <https://doi.org/10.1016/j.ijpsycho.2013.05.001>
- Moray, N.** (1959). Attention in dichotic listening: Affective cues and the influence of instructions. *Quarterly Journal of Experimental Psychology*, 11, 56–60. DOI: <https://doi.org/10.1080/17470215908416289>
- Most, S. B., Smith, S. D., Cooter, A. B., Levy, B. N., & Zald, D. H.** (2007). The naked truth: Positive, arousing distractors impair rapid target perception. *Cognition & Emotion*, 21, 964–981. DOI: <https://doi.org/10.1080/02699930600959340>
- Murayama, K., & Kitagami, S.** (2014). Consolidation power of extrinsic rewards: Reward cues enhance long-term memory for irrelevant past events. *Journal of Experimental Psychology: General*, 143, 15–20. DOI: <https://doi.org/10.1037/a0031992>
- Murty, V. P., & Dickerson, K. C.** (2017). Motivational influences on memory. In: *Advances in Motivation and Achievement*, 203–227. Emerald Group Publishing Limited.
- Murty, V. P., LaBar, K. S., & Adcock, R. A.** (2012). Threat of punishment motivates memory encoding via amygdala, not midbrain, interactions with the medial temporal lobe. *Journal of Neuroscience*, 32, 8969–8976. DOI: <https://doi.org/10.1523/JNEUROSCI.0094-12.2012>
- Murty, V. P., LaBar, K. S., Hamilton, D. A., & Adcock, R. A.** (2011). Is all motivation good for learning? dissociable influences of approach and avoidance motivation in declarative memory. *Learning & Memory*, 18, 712–717. DOI: <https://doi.org/10.1101/lm.023549.111>
- Nairne, J. S., & Pandeirada, J. N. S.** (2008). Adaptive memory: Is survival processing special? *Journal of Memory and Language*, 59, 377–385. DOI: <https://doi.org/10.1016/j.jml.2008.06.001>
- Nairne, J. S., Pandeirada, J. N. S., & Thompson, S. R.** (2008). Adaptive memory: The comparative value of survival processing. *Psychological Science*, 19, 176–180. DOI: <https://doi.org/10.1111/j.1467-9280.2008.02064.x>
- Nairne, J. S., Thompson, S. R., & Pandeirada, J. N. S.** (2007). Adaptive memory: Survival processing enhances retention. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 33, 263–273. DOI: <https://doi.org/10.1037/0278-7393.33.2.263>
- Northoff, G., & Hayes, D. J.** (2011). Is our self nothing but reward? *Biological Psychiatry*, 69, 1019–1025. DOI: <https://doi.org/10.1016/j.biopsych.2010.12.014>
- Northoff, G., Heinzl, A., de Greck, M., Bermpohl, F., Dobrowolny, H., & Panksepp, J.** (2006). Self-referential processing in our brain: A meta-analysis of imaging studies on the self. *NeuroImage*, 31, 440–457. DOI: <https://doi.org/10.1016/j.neuroimage.2005.12.002>
- Oakes, M. A., & Onyper, S. V.** (2017). The movement-induced self-reference effect: enhancing

- memorability through movement toward the self. *Cognitive Processing*. DOI: <https://doi.org/10.1007/s10339-017-0810-0>
- Otto, A. R., Fleming, S. M., & Glimcher, P. W.** (2016). Unexpected but incidental positive outcomes predict real-world gambling. *Psychological Science*, *27*, 299–311. DOI: <https://doi.org/10.1177/0956797615618366>
- Pachur, T., Mata, R., & Hertwig, R.** (2017). Who dares, who errs? disentangling cognitive and motivational roots of age differences in decisions under risk. *Psychological Science*, *28*, 504–518. DOI: <https://doi.org/10.1177/0956797616687729>
- Padulo, C., Carlucci, L., Manippa, V., Marzoli, D., Saggino, A., Tommasi, L., Puglisi-Allegra, S., & Brancucci, A.** (2017). Valence, familiarity and arousal of different foods in relation to age, sex and weight. *Food Quality and Preference*, *57*, 104–113. DOI: <https://doi.org/10.1016/j.foodqual.2016.12.010>
- Panksepp, J., Lane, R. D., Solms, M., & Smith, R.** (2017). Reconciling cognitive and affective neuroscience perspectives on the brain basis of emotional experience. *Neuroscience & Biobehavioral Reviews*, *76*, 187–215. DOI: <https://doi.org/10.1016/j.neubiorev.2016.09.010>
- Pessiglione, M., Schmidt, L., Draganski, B., Kalisch, R., Lau, H., Dolan, R. J., & Frith, C. D.** (2007). How the brain translates money into force: A neuroimaging study of subliminal motivation. *Science*, *316*, 904–906. DOI: <https://doi.org/10.1126/science.1140459>
- Pessoa, L.** (2009). How do emotion and motivation direct executive control? *Trends in Cognitive Sciences*, *13*, 160–166. DOI: <https://doi.org/10.1016/j.tics.2009.01.006>
- Phelps, E. A., & LeDoux, J. E.** (2005). Contributions of the amygdala to emotion processing: From animal models to human behavior. *Neuron*, *48*, 175–187. DOI: <https://doi.org/10.1016/j.neuron.2005.09.025>
- Pickel, K. L.** (1998). Unusualness and threat as possible causes of “weapon focus”. *Memory*, *6*, 277–295. DOI: <https://doi.org/10.1080/741942361>
- Polanía, R., Moisa, M., Opitz, A., Grueschow, M., & Ruff, C. C.** (2015). The precision of value-based choices depends causally on fronto-parietal phase coupling. *Nature Communications*, *6*, 8090. DOI: <https://doi.org/10.1038/ncomms9090>
- Pulvermüller, F.** (2005). Opinion: Brain mechanisms linking language and action. *Nature Reviews Neuroscience*, *6*, 576–582. DOI: <https://doi.org/10.1038/nrn1706>
- Qiao-Tasserit, E., Garcia Quesada, M., Antico, L., Bavelier, D., Vuilleumier, P., & Pichon, S.** (2017). Transient emotional events and individual affective traits affect emotion recognition in a perceptual decision-making task. *PLOS ONE*, *12*, e0171375. DOI: <https://doi.org/10.1371/journal.pone.0171375>
- Radel, R., & Clément-Guillot, C.** (2012). Evidence of motivational influences in early visual perception. *Psychological Science*, *23*, 232–234. DOI: <https://doi.org/10.1177/0956797611427920>
- Raymond, J. E., & O'Brien, J. L.** (2009). Selective visual attention and motivation. *Psychological Science*, *20*, 981–988. DOI: <https://doi.org/10.1111/j.1467-9280.2009.02391.x>
- Read, D., & Loewenstein, G.** (1999). Enduring pain for money: decisions based on the perception and memory of pain. *Journal of Behavioral Decision Making*, *12*, 1–17. DOI: [https://doi.org/10.1002/\(sici\)1099-0771\(199903\)12:11::aid-bdm310i3.0.co;2-v](https://doi.org/10.1002/(sici)1099-0771(199903)12:11::aid-bdm310i3.0.co;2-v)
- Redondo, R. L., Kim, J., Arons, A. L., Ramirez, S., Liu, X., & Tonegawa, S.** (2014). Bidirectional switch of the valence associated with a hippocampal contextual memory engram. *Nature*, *513*, 426–430. DOI: <https://doi.org/10.1038/nature13725>
- Rogers, T. B., Kuiper, N. A., & Kirker, W. S.** (1977). Self-reference and the encoding of personal information. *Journal of Personality and Social Psychology*, *35*, 677–688. DOI: <https://doi.org/10.1037/0022-3514.35.9.677>
- Roper, Z. J. J., & Vecera, S. P.** (2016). Funny money: the attentional role of monetary feedback detached from expected value. *Attention, Perception, & Psychophysics*, *78*, 2199–2212. DOI: <https://doi.org/10.3758/s13414-016-1147-y>
- Rosati, A. G., & Hare, B.** (2016). Reward currency modulates human risk preferences. *Evolution and Human Behavior*, *37*, 159–168. DOI: <https://doi.org/10.1016/j.evolhumbehav.2015.10.003>
- Samanez Larkin, G. R., Gibbs, S. E. B., Khanna, K., Nielsen, L., Carstensen, L. L., & Knutson, B.** (2007). Anticipation of monetary gain but not loss in healthy older adults. *Nature Neuroscience*, *10*, 787–791. DOI: <https://doi.org/10.1038/nn1894>
- Schmidt, L. J., Belopolsky, A. V., & Theeuwes, J.** (2015). Attentional capture by signals of threat. *Cognition and Emotion*, *29*, 687–694. DOI: <https://doi.org/10.1080/02699931.2014.924484>
- Schultz, W.** (2015). Neuronal reward and decision signals: From theories to data. *Physiological Reviews*, *95*, 853–951. DOI: <https://doi.org/10.1152/physrev.00023.2014>
- Sescousse, G., Barbalat, G., Domenech, P., & Dreher, J.-C.** (2013a). Imbalance in the sensitivity to different types of rewards in pathological gambling. *Brain*, *136*, 2527–2538. DOI: <https://doi.org/10.1093/brain/awt126>
- Sescousse, G., Caldú, X., Segura, B., & Dreher, J.-C.** (2013b). Processing of primary and secondary rewards: A quantitative meta-analysis and review of human functional neuroimaging studies. *Neuroscience & Biobehavioral Reviews*, *37*, 681–696. DOI: <https://doi.org/10.1016/j.neubiorev.2013.02.002>
- Sescousse, G., Redoute, J., & Dreher, J.-C.** (2010). The architecture of reward value coding in the human orbitofrontal cortex. *Journal of Neuroscience*, *30*, 13095–13104. DOI: <https://doi.org/10.1523/JNEUROSCI.3501-10.2010>
- Shafer, A. T., Matveychuk, D., Penney, T., O'Hare, A. J., Stokes, J., & Dolcos, F.** (2012). Processing of emotional distraction is both automatic and modulated by attention: Evidence from an event-related fMRI investigation. *Journal of Cognitive Neuroscience*, *24*, 1233–1252. DOI: <https://doi.org/10.1162/jocna.00206>

- Shebani, Z., & Pulvermüller, F.** (2013). Moving the hands and feet specifically impairs working memory for arm- and leg-related action words. *Cortex*, *49*, 222–231. DOI: <https://doi.org/10.1016/j.cortex.2011.10.005>
- Shigemune, Y., Abe, N., Suzuki, M., Ueno, A., Mori, E., Tashiro, M., Itoh, M., & Fujii, T.** (2010). Effects of emotion and reward motivation on neural correlates of episodic memory encoding: A PET study. *Neuroscience Research*, *67*, 72–79. DOI: <https://doi.org/10.1016/j.neures.2010.01.003>
- Shohamy, D., & Adcock, R. A.** (2010). Dopamine and adaptive memory. *Trends in Cognitive Sciences*, *14*, 464–472. DOI: <https://doi.org/10.1016/j.tics.2010.08.002>
- Skiba, R. M., & Snow, J. C.** (2016). Attentional capture for tool images is driven by the head end of the tool, not the handle. *Attention, Perception, & Psychophysics*, *78*, 2500–2514. DOI: <https://doi.org/10.3758/s13414-016-1179-3>
- Skrynka, J., & Vincent, B.** (2017). Subjective hunger, not blood glucose, influences domain general time preference. *PsyArXiv*, qgp54. DOI: <https://doi.org/10.17605/OSF.IO/QGP54>
- Snow, J. C., Pettypiece, C. E., McAdam, T. D., McLean, A. D., Stroman, P. W., Goodale, M. A., & Culham, J. C.** (2011). Bringing the real world into the fMRI scanner: Repetition effects for pictures versus real objects. *Scientific Reports*, *1*. DOI: <https://doi.org/10.1038/srep00130>
- Snow, J. C., Skiba, R. M., Coleman, T. L., & Berryhill, M. E.** (2014). Real-world objects are more memorable than photographs of objects. *Frontiers in Human Neuroscience*, *8*, 837. DOI: <https://doi.org/10.3389/fnhum.2014.00837>
- Soderstrom, N. C., & McCabe, D. P.** (2011). Are survival processing memory advantages based on ancestral priorities? *Psychonomic Bulletin & Review*, *18*, 564–569. DOI: <https://doi.org/10.3758/s13423-011-0060-6>
- Spaniol, J., Schain, C., & Bowen, H. J.** (2013). Reward-enhanced memory in younger and older adults. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *69*, 730–740. DOI: <https://doi.org/10.1093/geronb/gbt044>
- Squires, S. D., Macdonald, S. N., Culham, J. C., & Snow, J. C.** (2016). Priming tool actions: Are real objects more effective primes than pictures? *Experimental Brain Research*, *234*, 963–976. DOI: <https://doi.org/10.1007/s00221-015-4518-z>
- Stebly, N. M.** (1992). A meta-analytic review of the weapon focus effect. *Law and Human Behavior*, *16*, 413–424. DOI: <https://doi.org/10.1007/BF02352267>
- Strange, B. A., Hurlemann, R., & Dolan, R. J.** (2003). An emotion-induced retrograde amnesia in humans is amygdala- and β -adrenergic-dependent. *Proceedings of the National Academy of Sciences*, *100*, 13626–13631. DOI: <https://doi.org/10.1073/pnas.1635116100>
- Symons, C. S., & Johnson, B. T.** (1997). The self-reference effect in memory: A meta-analysis. *Psychological Bulletin*, *121*, 371–394. DOI: <https://doi.org/10.1037/0033-2909.121.3.371>
- Tacikowski, P., & Nowicka, A.** (2010). Allocation of attention to self-name and self-face: An ERP study. *Biological Psychology*, *84*, 318–324. DOI: <https://doi.org/10.1016/j.biopsycho.2010.03.009>
- Talmi, D.** (2013). Enhanced emotional memory. *Current Directions in Psychological Science*, *22*, 430–436. DOI: <https://doi.org/10.1177/0963721413498893>
- Talmi, D., Dayan, P., Kiebel, S. J., Frith, C. D., & Dolan, R. J.** (2009). How humans integrate the prospects of pain and reward during choice. *Journal of Neuroscience*, *29*, 14617–14626. DOI: <https://doi.org/10.1523/JNEUROSCI.2026-09.2009>
- Talmi, D., & Moscovitch, M.** (2004). Can semantic relatedness explain the enhancement of memory for emotional words? *Memory & Cognition*, *32*, 742–751. DOI: <https://doi.org/10.3758/BF03195864>
- Talmi, D., Ziegler, M., Hawksworth, J., Lalani, S., Herman, C. P., & Moscovitch, M.** (2013). Emotional stimuli exert parallel effects on attention and memory. *Cognition & Emotion*, *27*, 530–538. DOI: <https://doi.org/10.1080/02699931.2012.722527>
- Taylor, S. E.** (1991). Asymmetrical effects of positive and negative events: The mobilization-minimization hypothesis. *Psychological Bulletin*, *110*, 67–85. DOI: <https://doi.org/10.1037/0033-2909.110.1.67>
- Tiedemann, L. J., Schmid, S. M., Hettel, J., Giesen, K., Francke, P., Büchel, C., & Brassens, S.** (2017). Central insulin modulates food valuation via mesolimbic pathways. *Nature Communications*, *8*, 16052. DOI: <https://doi.org/10.1038/ncomms16052>
- Tousignant, C., & Pexman, P. M.** (2012). Flexible recruitment of semantic richness: context modulates body-object interaction effects in lexical-semantic processing. *Frontiers in Human Neuroscience*, *6*, 53. DOI: <https://doi.org/10.3389/fnhum.2012.00053>
- Truong, G., Chapman, C. S., Chisholm, J. D., Enns, J. T., & Handy, T. C.** (2016). Mine in motion: How physical actions impact the psychological sense of object ownership. *Journal of Experimental Psychology: Human Perception and Performance*, *42*, 375–385. DOI: <https://doi.org/10.1037/xhp0000142>
- Truong, G., Roberts, K. H., & Todd, R. M.** (2017). I saw mine first: A prior-entry effect for newly acquired ownership. *Journal of Experimental Psychology: Human Perception and Performance*, *43*, 192–205. DOI: <https://doi.org/10.1037/xhp0000295>
- Tsetsos, K., Chater, N., & Usher, M.** (2012). Salience driven value integration explains decision biases and preference reversal. *Proceedings of the National Academy of Sciences*, *109*, 9659–9664. DOI: <https://doi.org/10.1073/pnas.1119569109>
- Tsukiura, T., & Cabeza, R.** (2008). Orbitofrontal and hippocampal contributions to memory for face-name associations: The rewarding power of a smile. *Neuropsychologia*, *46*, 2310–2319. DOI: <https://doi.org/10.1016/j.neuropsychologia.2008.03.013>
- Tucker, M., & Ellis, R.** (1998). On the relations between seen objects and components of potential actions. *Journal of Experimental Psychology: Human Perception and Performance*, *24*, 830–846. DOI: <https://doi.org/10.1037/0096-1523.24.3.830>
- Vlaev, I., Seymour, B., Chater, N., Winston, J. S., Yoshida, W., Wright, N., Symmonds, M., &**

- Dolan, R.** (2014). Prices need no preferences: Social trends determine decisions in experimental markets for pain relief. *Health Psychology, 33*, 66–76. DOI: <https://doi.org/10.1037/a0030372>
- Vlaev, I., Seymour, B., Dolan, R. J., & Chater, N.** (2009). The price of pain and the value of suffering. *Psychological Science, 20*, 309–317. DOI: <https://doi.org/10.1111/j.1467-9280.2009.02304.x>
- Vrijzen, J. N., van Oostrom, I., Speckens, A., Becker, E. S., & Rinck, M.** (2013). Approach and avoidance of emotional faces in happy and sad mood. *Cognitive Therapy and Research, 37*, 1–6. DOI: <https://doi.org/10.1007/s10608-012-9436-9>
- Vuilleumier, P., & Schwartz, S.** (2001). Emotional facial expressions capture attention. *Neurology, 56*, 153–158. DOI: <https://doi.org/10.1212/WNL.56.2.153>
- Wadlinger, H. A., & Isaacowitz, D. M.** (2006). Positive mood broadens visual attention to positive stimuli. *Motivation and Emotion, 30*, 87–99. DOI: <https://doi.org/10.1007/s11031-006-9021-1>
- Wagner, D. D., Boswell, R. G., Kelley, W. M., & Heatherton, T. F.** (2012). Inducing negative affect increases the reward value of appetizing foods in dieters. *Journal of Cognitive Neuroscience, 24*, 1625–1633. DOI: <https://doi.org/10.1162/jocna.00238>
- Wang, L., Yu, H., & Zhou, X.** (2013). Interaction between value and perceptual salience in value-driven attentional capture. *Journal of Vision, 13*, 5–5. DOI: <https://doi.org/10.1167/13.3.5>
- Weiner, B., & Walker, E. L.** (1966). Motivational factors in short-term retention. *Journal of Experimental Psychology, 71*, 190–193. DOI: <https://doi.org/10.1037/h0022848>
- Weinstein, Y., Bugg, J. M., & Roediger, H. L.** (2008). Can the survival recall advantage be explained by basic memory processes? *Memory & Cognition, 36*, 913–919. DOI: <https://doi.org/10.3758/MC.36.5.913>
- Wentura, D., Rothermund, K., & Bak, P.** (2000). Automatic vigilance: The attention-grabbing power of approach- and avoidance-related social information. *Journal of Personality and Social Psychology, 78*, 1024–1037. DOI: <https://doi.org/10.1037/0022-3514.78.6.1024>
- Williams, L. A., & DeSteno, D.** (2008). Pride and perseverance: The motivational role of pride. *Journal of Personality and Social Psychology, 94*, 1007–1017. DOI: <https://doi.org/10.1037/0022-3514.94.6.1007>
- Wilson, A. D., & Golonka, S.** (2013). Embodied cognition is not what you think it is. *Frontiers in Psychology, 4*, 58. DOI: <https://doi.org/10.3389/fpsyg.2013.00058>
- Wispiński, N. J., Truong, G., Handy, T. C., & Chapman, C. S.** (2017). Reaching reveals that best-versus-rest processing contributes to biased decision making. *Acta Psychologica, 176*, 32–38. DOI: <https://doi.org/10.1016/j.actpsy.2017.03.006>
- Witt, J. K., Kemmerer, D., Linkenauger, S. A., & Culham, J.** (2010). A functional role for motor simulation in identifying tools. *Psychological Science, 21*, 1215–1219. DOI: <https://doi.org/10.1177/0956797610378307>
- Wolpert, D. M., Ghahramani, Z., & Flanagan, J.** (2001). Perspectives and problems in motor learning. *Trends in Cognitive Sciences, 5*, 487–494. DOI: [https://doi.org/10.1016/S1364-6613\(00\)01773-3](https://doi.org/10.1016/S1364-6613(00)01773-3)
- Wood, N., & Cowan, N.** (1995). The cocktail party phenomenon revisited: How frequent are attention shifts to one's name in an irrelevant auditory channel? *Journal of Experimental Psychology: Learning, Memory, and Cognition, 21*, 255–260. DOI: <https://doi.org/10.1037/0278-7393.21.1.255>
- Woud, M. L., Becker, E. S., Lange, W.-G., & Rinck, M.** (2013). Effects of approach-avoidance training on implicit and explicit evaluations of neutral, angry, and smiling face stimuli. *Psychological Reports, 113*, 199–216. DOI: <https://doi.org/10.2466/21.07.PR0.113x10z1>
- Xie, W., & Zhang, W.** (2016). Negative emotion boosts quality of visual working memory representation. *Emotion, 16*, 760–774. DOI: <https://doi.org/10.1037/emo0000159>
- Xie, W., & Zhang, W.** (2017). Negative emotion enhances mnemonic precision and subjective feelings of remembering in visual long-term memory. *Cognition, 166*, 73–83. DOI: <https://doi.org/10.1016/j.cognition.2017.05.025>
- Yamawaki, R., Nakamura, K., Aso, T., Shigemune, Y., Fukuyama, H., & Tsukiura, T.** (in press). Remembering my friends: Medial prefrontal and hippocampal contributions to the self-reference effect on face memories in a social context. *Human Brain Mapping*. DOI: <https://doi.org/10.1002/hbm.23662>
- Yee, D. M., Krug, M. K., Allen, A. Z., & Braver, T. S.** (2016). Humans integrate monetary and liquid incentives to motivate cognitive task performance. *Frontiers in Psychology, 6*, 2037. DOI: <https://doi.org/10.3389/fpsyg.2015.02037>
- Yoon, S., Vo, K., & Venkatraman, V.** (2017). Variability in decision strategies across description-based and experience-based decision making. *Journal of Behavioral Decision Making*. DOI: <https://doi.org/10.1002/bdm.2009>
- Zeigenfuse, M. D., Pleskac, T. J., & Liu, T.** (2014). Rapid decisions from experience. *Cognition, 131*, 181–194. DOI: <https://doi.org/10.1016/j.cognition.2013.12.012>
- Zhou, X., & Gao, D.-G.** (2008). Social support and money as pain management mechanisms. *Psychological Inquiry, 19*, 127–144. DOI: <https://doi.org/10.1080/10478400802587679>
- Zimmerman, C. A., & Kelley, C. M.** (2010). 'I'll remember this!' effects of emotionality on memory predictions versus memory performance. *Journal of Memory and Language, 62*, 240–253. DOI: <https://doi.org/10.1016/j.jml.2009.11.004>
- Zink, C. F., Tong, Y., Chen, Q., Bassett, D. S., Stein, J. L., & Meyer-Lindenberg, A.** (2008). Know your place: Neural processing of social hierarchy in humans. *Neuron, 58*, 273–283. DOI: <https://doi.org/10.1016/j.neuron.2008.01.025>

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