Media content sharing as a value-based decision

Scholz, C.; Jovanova, M.; Baek, E.C.; Falk, E.B.

DOI
10.1016/j.copsyc.2019.08.004
Publication date
2020
Document Version
Final published version
Published in
Current Opinion in Psychology

Available online at www.sciencedirect.com

ScienceDirect

Current Opinion in Psychology

Media content sharing as a value-based decision

Christin Scholz[1], Mia Jovanova[2], Elisa C Baek[2,5,6] and Emily B Falk[2,3,4]

Exposure to media content (e.g. persuasive campaigns) affects daily behaviors, but these effects are partially determined by whether and how people who are exposed to the content share it with their peers. To decide whether to share, potential sharers need to compare and integrate diverse sources of information including characteristics of the media content and various social influences. What are the mechanisms that enable sharers to make such complex decisions quickly and effortlessly? We review evidence that sharing is preceded by a value-based decision-making process supported by three key characteristics of the so-called neural valuation system (domain-generality, value integration, and context-dependence). Finally, we describe theoretical and methodological advances that can be gained from conceptualizing sharing as a value-based decision-making process.

Addresses
[1] Amsterdam School of Communication, University of Amsterdam, Nieuwe Achtergracht 166, 1018WV Amsterdam, The Netherlands
[2] Annenberg School for Communication, University of Pennsylvania, 3620 Walnut Street, Philadelphia 19104, PA, USA
[3] Department of Psychology, University of Pennsylvania, 425 S. University Avenue, Philadelphia 19104, PA, USA
[4] Marketing Department, The Wharton School, University of Pennsylvania, 3733 Spruce Street, Philadelphia 19104, PA, USA
[5] Department of Psychology, University of California, Los Angeles, USA
[6] Department of Mathematics, University of California, Los Angeles, USA

Corresponding authors: Scholz, Christin (c.scholz@uva.nl), Falk, Emily B (emily.falk@asc.upenn.edu)

Current Opinion in Psychology 2020, **31**:83–88

This review comes from a themed issue on **Privacy & disclosure, online & in social interactions**

Edited by **Leslie John**, **Diana Tamir** and **Michael Slepian**

https://doi.org/10.1016/j.copsyc.2019.08.004

Introduction

Imagine a college student, Anna, whose friend, Julie, is drinking too much alcohol, too quickly. Sharing information about the risks of binge drinking from a public health media campaign may help Anna convince Julie to stop drinking. Yet, the prevailing social norm among college students tends toward pro-alcohol conversations [1–3] and suggests that Julie may react unkindly if Anna shares the anti-binge drinking information. As this example illustrates, when deciding whether to share media content with others, potential sharers usually integrate at least two types of information, namely information about the media content itself [4,5] (e.g. its credibility, relevance, or usefulness) and about relevant social influences, including perceived social norms or opinions expressed by peers, for instance those the content could be shared with [6,7]. For Anna, integrating two such inherently incomparable inputs to decide what information to share is akin to comparing proverbial apples and oranges. Despite this complexity, in daily life, people make sharing decisions relatively effortlessly and share media content without laboriously weighing each pro and con of sharing. What mechanisms make this possible?

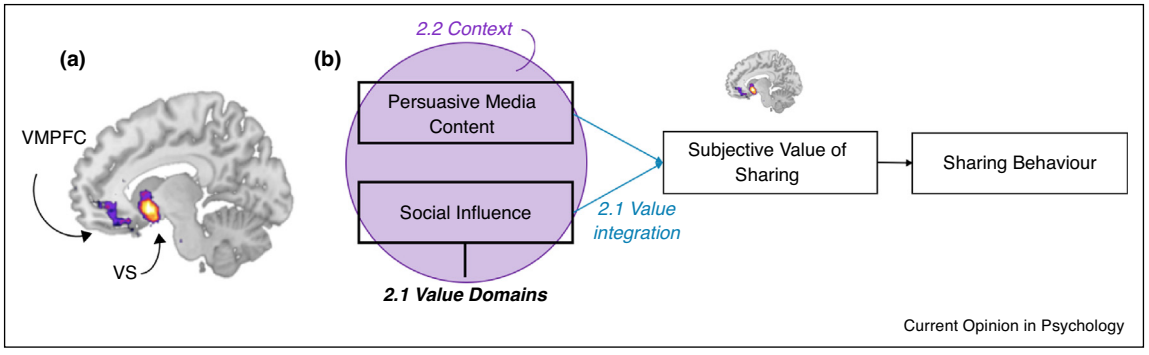
Understanding the processes that lead to sharing is important. Sharing media content can profoundly impact attitudes and behaviors in large groups [8,9,10•,11,12] by selectively amplifying or changing effects of some, but not other [5,8,9], pieces of media content on target audiences in ways intended or unintended by the original content creators [10•,11,12].[1] Social sciences and neurosciences have formally modeled increasingly complex types of human decision-making, from simple choices between two options to complex, context-dependent decisions between multiple alternative options, taking into account multiple decision-relevant attributes [16••,17••]. These models identify key parameters and mechanisms that drive decision-making across contexts and can help to better understand and predict complex real-world decisions about media content sharing. A central concept in this literature is subjective value maximization, a process by which decision-makers choose the option that is perceived to be most valuable given the available information. Here we discuss how key characteristics of value-based decision-making and the underlying neural mechanisms can support real-world sharing decisions.

Value-based decision-making and sharing

In hundreds of neuroimaging studies, the extent to which a stimulus was perceived as valuable by a participant consistently scaled with brain activity within areas of the so-called *neural valuation system* (Figure 1a, [18–20]),

[1] Prominent examples of media content sharing on society are evident across domains like politics and health. For instance, news stories shared on social media played a significant role in recent democratic elections (e.g. [5,13]) and the effectiveness of health-promotion campaigns partially depends on whether and how they are discussed socially [10•,14,15].

Figure 1



(a) Neural activity associated with '*value*' in ventromedial-prefrontal cortex (VMPFC) and ventral striatum (VS) meta-analytically defined based on www.neurosynth.org, **(b)** Conceptual model of decision-making about information sharing under competing sources of influence.

including ventromedial prefrontal cortex (VMPFC) and ventral striatum (VS). Activity in these brain regions in response to a stimulus also predicts subsequent laboratory choices [21,22] and real-world actions like donations [23].

Neural activity in value-related brain regions is also centrally involved in decisions about information sharing [24–26]. Yet, sharing research has yet to take full advantage of insights from basic decision-making research on the parameters and mechanisms driving neural value-related activity. We highlight how three key characteristics of the neural value signal may support sharing decisions (Sections 'Domain-General Value and Value Integration' and 'Context-Dependent Valuation of Media and Social Influence'; Figure 1b) and describe implications of this psycho-physiological framework of sharing for future research (Section 'Theoretical implications and future directions').

Domain-general value and value integration

What might be going on in Anna's brain as she decides whether sharing information from the anti-drinking campaign with Julie is a valuable option? As illustrated above, she may note, compare, and weigh the relevance of the media content itself and anticipated social influences like opinions and potential reactions of peers. At first glance, Anna is comparing apples and oranges. Neuroscientific research, however, suggests that the neural value signal is domain-general, such that it allows the processing of diverse decision inputs within one network of brain regions. Further, neural value-related activity also allows direct comparisons between inherently incomparable inputs using a process called value integration.

Specifically, domain-generality means that the neural valuation system encodes the subjective value of and subsequently predicts behavioral responses to a wide range of stimuli including primary, monetary, and social rewards [18,19,27]. That is, decisions as diverse as whether to eat a chocolate bar [28] and whether to donate to a crowdfunding campaign [29] are, in part, supported by overlapping regions of the brain. To this end, a large number of functional connections between the neural valuation system and other brain areas allow the valuation system to collect information from computations that occurred elsewhere in the brain in one set of regions to compute their respective subjective values [30–34].

Domain-generality of the neural value signal extends to decision inputs that are relevant to decisions about sharing such as Anna's, including the evaluation of attributes of the media content (e.g. Is the source credible?) and social influence (What will my peers think about this information?; for a review see Refs. [35,36••]). Few studies have directly examined inputs to the neural value responses during sharing decisions (e.g. neural valuation of sharing as a function of media content or social influence; c.f [24,25,37]). However, work in other domains demonstrates that value-related brain responses to media stimuli like crowdfunding campaigns, New York Times articles, and public health campaigns tracks with people's preferences for the content and subsequent behaviors within study samples [24,38–40] and out-of-sample behaviors of large populations such as New York State smokers [41] and users of crowdfunding websites [34]. Similarly, effects of social influence on behavior are supported by neural value-related activity. For instance, information about social rewards, like learning that one's actions conform to group norms [42–46], enhances activity within the neural value system [42,47]. This neural activity then predicts whether or not people conform to social influence [48,49]. In sum, the neural valuation system supports the evaluation of choices based on both media content and social influence and, thus, likely plays a crucial role in sharing decisions (Figure 1b).

Yet, domain-generality in itself does not solve Anna's problem. Beyond processing media and social inputs to

her decision separately, Anna must compare and weigh them against each other to maximize the value of her final choice using all the available information. To support this value integration process, the neural value signal represents diverse information in a comparable manner by translating seemingly incomparable information onto a common scale using a so-called common-currency signal [30,50–52]. To understand this metaphor, imagine you are an American being offered money for a service from two potential international buyers. One offer is in Euros, one in Pounds. Deciding which bid is more valuable, requires an understanding of the exchange rate between the currencies. As American, you are likely to convert both offers into US Dollars, a common currency. The neural value (or common-currency) signal provides such exchange rates, even for seemingly incomparable inputs like media content and social influence. Using the common-currency signal, decision-makers may upweight or downweight the value assigned to features of one type of input (e.g. the quality of arguments in an anti-drinking campaign) depending on features of another influence type (e.g. the attention span of a drunk conversation partner) and thereby integrate them into one coherent decision. Hence, the common-currency signal enables decision-makers to choose the most valuable option by integrating multiple, diverse inputs.

For sharing decisions, behavioral research has shown that social influences affect the interpretation and perceived importance of media content and *vice versa* [10]. The role of neural value integration in this context has not been tested directly. Yet, recent evidence suggests that this is a fruitful direction for future work. Specifically, neural value-related activity mediates effects of brain activity within self-related and social processing areas to predict sharing behavior [25], suggesting that the neural valuation system integrates inputs from other regions during sharing decisions. To interpret these findings using Anna's example: Anna's neural value signal may allow her to integrate thoughts about potential consequences of sharing the anti-alcohol media campaign for herself (e.g. Will I look knowledgeable or like a 'know-it-all'?) and for her relationship with Julie (e.g. Will Julie think I'm being annoying or a good friend?). External information like media content and social influence may inform evaluations of whether these internal motivations can be achieved by sharing the anti-drinking campaign. Consistent with this value integration perspective, participants of another study who were more successful at increasing their neural value-related activity while viewing anti-drinking campaigns using an emotion-regulation strategy were also less susceptible to pro-drinking peer influence in the following month [3]. That is, consciously boosting effects of media content on behavior was associated with reduced susceptibility to contradictory social influences. This finding suggests that both types of influence rely on one underlying process. In sum, extant evidence points toward a value integration role of the neural valuation system when decision-makers consider social and media influences. However, this theory has not been tested conclusively in the context of sharing.

Context-dependent valuation of media and social influence

Finally, an additional layer of complexity in sharing decisions is the fact that the same (mediated and social) inputs can have different effects in different contexts. For instance, Anna's decision about whether to share anti-binge drinking media information with Julie would be affected by how long ago she saw the media campaign and whether it is top of mind ('temporal context') and by whether she is alone with Julie or with other drinking/non-drinking peers ('spatial context'). That is, the value that a piece of information contributes to a decision is not absolute, but relative to relevant and irrelevant contextual information [53,54]. Similar to sharing behavior, the neural value signal is affected by both temporal (information encountered previously) and spatial context (alternative decision options available at the time of choice [17,55,56•]). Specifically, across species, neural value-related activity is partially dependent on the value of alternative options/stimuli [55]. For instance, the neural value assigned to eating an apple increases with the subjective value of apples, but decreases when alternative, highly valuable snack options (e.g. chocolate bars) are available.

Context effects have also been found in the study of sharing decisions. For instance, the size of a sharer's potential audience impacts the extent to which brain regions, known to be important in sharing decisions, are engaged during decisions about news sharing [7]. Further, while making sharing decisions about news articles, participants wo identified as avid news readers showed greater functional connectivity between the neural valuation system and brain areas often associated with deliberate/effortful processing [57]. In sum, extant evidence suggests that a systematic integration of contextual features into future research on value-based decisions about information sharing may help to better understand and predict sharing decisions.

Theoretical implications and future directions

In sum, extant evidence supports the idea that value-based decision-making in the brain has key characteristics which can support specific requirements of information sharing decisions. Yet, many specific predictions made by formal decision-making models have not yet been tested in the sharing context. One example is the prediction that the neural value signal encodes both social influence and media content in a comparable manner and, thereby, explains interactions between these types of influence on media content sharing. In turn, studying sharing through the lens of value-based decision-making and paying special attention to individual characteristics of

neural value-related processing has several theoretical and methodological advantages.

First, the *domain-generality* of neural valuation suggests that overlapping mechanisms drive previously separate research lines focused on social influence [58] or media content effects on sharing [4]. This calls for an overarching theoretical framework. To further develop this research line, experiments should systematically vary features of media content or social influence to assess causal effects on neural value-related activity and sharing behavior.

Second, the role of the neural valuation system in *value integration* may explain how seemingly incomparable types of influence like social influence and media content are seamlessly integrated into daily sharing decisions. This can help to explain and forecast real-world situations such as Anna's, in which decision-makers are confronted with conflicting information from multiple sources. Relatedly, neural valuation as a summary signal of diverse decision inputs is a useful methodological tool when studying mechanisms of decision-making, because lay participants struggle to report complex value integration processes through self-report.

Finally, prior work has studied and theorized information sharing behaviors separately in different domains such as politics, health, and marketing which is inefficient. Understanding and quantifying the *context-dependence* of the neural value signal during sharing decisions allows for future research to further understand and predict the sharing of media content across contexts.

In sum, sharing can be conceptualized as a value-based decision-making process, and formal tests that derive from this conceptualization stand to advance both theory and practice.

Conflict of interest statement

Nothing declared.

Acknowledgements

C. Scholz' work was partially covered by an ASPASIA premium sub-grant from the Dutch Science Foundation (NWO). The authors also gratefully acknowledge support from the DARPA Social Sim Program (under the Power of Ideas on the Internet; POINT project), The U.S. Army Research Office under grant number W911NF-18-1-0244, ARL Cooperative Agreement Number W911NF-10-2-0022, Subcontract Number APX02-0006, and the National Cancer Institute (1R01CA229305-01A1).

References and recommended reading

Papers of particular interest, published within the period of review, have been highlighted as:

- • of special interest
- •• of outstanding interest

1. Hendriks H, de Bruijn GJ: **What do Dutch college students talk about when they talk about alcohol?** *Health Behav Policy Rev* 2015, **2**:232-242 http://dx.doi.org/10.14485/HBPR.2.3.8.

2. Hendriks H, van den Putte B, Gebhardt WA, Moreno MA: **Social drinking on social media: content analysis of the social aspects of alcohol-related posts on Facebook and Instagram**. *J Med Internet Res* 2018, **20**:e226 http://dx.doi.org/10.2196/jmir.9355.

3. Scholz C, Doré BP, Cooper N, Falk EB: **Neural message engagement predicts susceptibility to conversational influence on drinking behavior**. *Health Psychol* 2019, **38**:658-667 http://dx.doi.org/10.1037/hea0000732.

4. Cappella JN, Kim HS, Albarracín D: **Selection and transmission processes for information in the emerging media environment: psychological motives and message characteristics**. *Media Psychol* 2015, **18**:396-424 http://dx.doi.org/10.1080/15213269.2014.941112.

5. Vosoughi S, Roy D, Aral S: **The spread of true and false news online**. *Science* 2018, **359**:1146-1151 http://dx.doi.org/10.1126/science.aap9559.

6. Ihm J, Kim E: **The hidden side of news diffusion: understanding online news sharing as an interpersonal behavior**. *New Media Soc* 2018, **20**:4346-4365 http://dx.doi.org/10.1177/1461444818772847.

7. Scholz C, Baek EC, O'Donnell MB, Falk EB: **Decision-making about broad- and narrowcasting: a neuroscientific perspective**. *Media Psychol* 2019 http://dx.doi.org/10.1080/15213269.2019.1572522.

8. Kim HS: **Attracting views and going viral: how message features and news-sharing channels affect health news diffusion**. *J Commun* 2015, **65**:512-534 http://dx.doi.org/10.1111/jcom.12160.

9. Lee D, Hosanagar K, Nair HS: **Advertising content and consumer engagement on social media: evidence from facebook**. *Manage Sci* 2018, **64**:5105-5131 http://dx.doi.org/10.1287/mnsc.2017.2902.

10. • Jeong M, Bae RE: **The effect of campaign-generated interpersonal communication on campaign-targeted health outcomes: a meta-analysis**. *Health Commun* 2017, **0**:1-16 http://dx.doi.org/10.1080/10410236.2017.1331184
Jeong and Bae conducted the first formal meta-analysis examining the extent to which interpersonal conversations about a health campaign mediate campaign effects. On average, campaign-generated interpersonal communication showed a positive effect on campaign-targeted outcomes. This effect was moderated, among others, by the campaign's topic, the targeted outcome, and the conversation partner with whom individuals talked about the campaign. In other words, this paper summarizes extant evidence suggesting that mediated and social influences do not affect health behavior independently of each other. Instead, they interact in meaningful ways.

11. Berger J: **Word of mouth and interpersonal communication: a review and directions for future research**. *J Consum Psychol* 2014, **24**:586-607 http://dx.doi.org/10.1016/j.jcps.2014.05.002.

12. Meng J, Peng W, Tan P-N, Liu W, Cheng Y, Bae A: **Diffusion size and structural virality: the effects of message and network features on spreading health information on twitter**. *Comput Hum Behav* 2018, **89**:111-120 http://dx.doi.org/10.1016/j.chb.2018.07.039.

13. Lazer DMJ, Baum MA, Benkler Y, Berinsky AJ, Greenhill KM, Menczer F, Metzger MJ, Nyhan B, Pennycook G, Rothschild D *et al.*: **The science of fake news**. *Science* 2018, **359**:1094-1096 http://dx.doi.org/10.1126/science.aao2998.

14. Hornik RC, Yanovitzky I: **Using theory to design evaluations of communication campaigns: the case of the National Youth Anti-Drug Media Campaign**. *Commun Theory* 2003, **13**:204-224.

15. Southwell BG: *Social Networks and Popular Understanding of Science and Health: Sharing Disparities*. Baltimore, MD: Johns Hopkins University Press; 2013.

16. •• Busemeyer JR, Gluth S, Rieskamp J, Turner BM: **Cognitive and neural bases of multi-attribute, multi-alternative, value-based decisions**. *Trends Cogn Sci* 2019, **23**:251-263 http://dx.doi.org/10.1016/j.tics.2018.12.003
Busemeyer *et al.* provide a recent review of advances in decision-neuroscience, particularly in describing multi-attribute, multi-alternative decisions, which moves the field closer to describing complex real-world

decision-making. They describe efforts to model such decisions with increasingly sophisticated models and provide an overview of what is known about the underling neural mechanisms. The authors highlight the importance of context-dependence in choice behavior as well as initial neuroimaging evidence capturing context effects.

17. •• Chawla M, Miyapuram KP: **Context-sensitive computational mechanisms of decision making**. *J Exp Neurosci* 2018, **12** http://dx.doi.org/10.1177/1179069518809057
Chawla and Miyapuram provide a helpful overview of research in several decision-making domains including value-based decisions, sensory decisions, and social decision-making. The authors argue that, although these types of decisions have long been studied separately, complex real-life decisions cannot be neatly assigned to only one category, suggesting the need for domain-general frameworks of decision-making. Understanding context-effects on choice behavior including mechanisms such as normalization or neuronal adaptation is identified as an important step toward such a framework.

18. Bartra O, McGuire JT, Kable JW: **The valuation system: a coordinate-based meta-analysis of BOLD fMRI experiments examining neural correlates of subjective value**. *NeuroImage* 2013, **76**:412-427 http://dx.doi.org/10.1016/j.neuroimage.2013.02.063.

19. Clithero JA, Rangel A: **Informatic parcellation of the network involved in the computation of subjective value**. *Soc Cogn Affect Neurosci* 2014, **9**:1289-1302 http://dx.doi.org/10.1093/scan/nst106.

20. Oldham S, Murawski C, Fornito A, Youssef G, Yucel M, Lorenzetti V: **The anticipation and outcome phases of reward and loss processing: a neuroimaging meta-analysis of the monetary incentive delay task**. *Hum Brain Mapp* 2018, **39**:3389-3418 http://dx.doi.org/10.1002/hbm.24184.

21. Kable JW, Glimcher PW: **The neural correlates of subjective value during intertemporal choice**. *Nat Neurosci* 2007, **10**:1625-1633.

22. Zha R, Bu J, Zhengde W, Han L, Zhang P, Ren J, Li JA, Wang Y, Yang L, Vollstädt-Klein S, Zhang X: **Transforming brain signals related to value evaluation and self-control into behavioral choices**. *Hum Brain Mapp* 2019, **40**:1049-1061 http://dx.doi.org/10.1002/hbm.24379.

23. Genevsky A, Knutson B: **Neural affective mechanisms predict market-level microlending**. *Psychol Sci* 2015, **26**:1411-1422 http://dx.doi.org/10.1177/0956797615588467.

24. Baek EC, Scholz C, O'Donnell MB, Falk EB: **The value of sharing information: a neural account of information transmission**. *Psychol Sci* 2017, **28**:851-861 http://dx.doi.org/10.1177/0956797617695073.

25. Scholz C, Baek EC, O'Donnell MB, Kim HS, Cappella JN, Falk EB: **A neural model of valuation and information virality**. *Proc Natl Acad Sci U S A* 2017, **114**:2881-2886 http://dx.doi.org/10.1073/pnas.1615259114.

26. Tamir DI, Zaki J, Mitchell JP: **Informing others is associated with behavioral and neural signatures of value**. *J Exp Psychol Gen* 2015, **144**:1114-1123 http://dx.doi.org/10.1037/xge0000122.

27. Chib VS, Rangel A, Shimojo S, O'Doherty JP: **Evidence for a common representation of decision values for dissimilar goods in human ventromedial prefrontal cortex**. *J Neurosci* 2009, **29**:12315-12320.

28. Hare TA, Camerer CF, Rangel A: **Self-control in decision-making involves modulation of the vmPFC valuation system**. *Science* 2009, **324**:646-648 http://dx.doi.org/10.1126/science.1168450.

29. Knutson B, Genevsky A: **Neuroforecasting aggregate choice**. *Curr Dir Psychol Sci* 2018, **27**:110-115 http://dx.doi.org/10.1177/0963721417737877.

30. Lim S-L, O'Doherty JP, Rangel A: **The decision value computations in the vmPFC and striatum use a relative value code that is guided by visual attention**. *J Neurosci* 2011, **31**:13214-13223 http://dx.doi.org/10.1523/JNEUROSCI.1246-11.2011.

31. Benoit RG, Szpunar KK, Schacter DL: **Ventromedial prefrontal cortex supports affective future simulation by integrating distributed knowledge**. *Proc Natl Acad Sci U S A* 2014, **111**:16550-16555 http://dx.doi.org/10.1073/pnas.1419274111.

32. Mattar MG, Thompson-Schill SL, Bassett DS: **The network architecture of value learning**. *Netw Neurosci* 2018, **2**:128-149 http://dx.doi.org/10.1162/netn_a_00021.

33. Ramnani N, Owen AM: **Anterior prefrontal cortex: insights into function from anatomy and neuroimaging**. *Nat Rev Neurosci* 2004, **5**:184-194 http://dx.doi.org/10.1038/nrn1343.

34. Hutcherson CA, Montaser-Kouhsari L, Woodward J, Rangel A: **Emotional and utilitarian appraisals of moral dilemmas are encoded in separate areas and integrated in ventromedial prefrontal cortex**. *J Neurosci* 2015, **35**:12593-12605 http://dx.doi.org/10.1523/JNEUROSCI.3402-14.2015.

35. Meshi D, Tamir DI, Heekeren HR: **The emerging neuroscience of social media**. *Trends Cogn Sci* 2015, **19**:771-782 http://dx.doi.org/10.1016/j.tics.2015.09.004.

36. •• Falk EB, Scholz C: **Persuasion, influence, and value: perspectives from communication and social neuroscience**. *Annu Rev Psychol* 2018, **69**:329-356 http://dx.doi.org/10.1146/annurev-psych-122216-011821
Falk and Scholz review and integrate literatures in communication science, social psychology, social, and cognitive neuroscience to provide a mechanistic account of persuasion and social influence, including information sharing behaviors. Value-based decision-making and its underlying neural mechanisms are highlighted as central components of a diverse set of persuasion-related processes.

37. Cascio CN, O'Donnell MB, Bayer J, Tinney FJ, Falk EB: **Neural correlates of susceptibility to group opinions in online word-of-mouth recommendations**. *J Mark Res* 2015, **52**:559-575 http://dx.doi.org/10.1509/jmr.13.0611.

38. Doré BP, Cooper N, Scholz C, O'Donnell MB, Falk EB: **Cognitive regulation of ventromedial prefrontal activity evokes lasting change in the perceived self-relevance of persuasive messaging**. *Hum Brain Mapp* 2019, **40**:2571-2580 http://dx.doi.org/10.10002/hbm.24545.

39. Kang Y, Cooper N, Pandey P, Scholz C, O'Donnell MB, Lieberman M, Strecher V, Dal Cin S, Konrath S, Polk T *et al.*: **Effects of self-transcendence on neural responses to persuasive messages and health behavior change**. *Proc Natl Acad Sci U S A* 2018, **115**:9974-9979.

40. Venkatraman V, Dimoka A, Pavlou PA, Vo K, Hampton W, Bollinger B, Hershfield HE, Ishihara M, Winer RS: **Predicting advertising success beyond traditional measures: new insights from neurophysiological methods and market response modeling**. *J Mark Res* 2014, **52**:436-452 http://dx.doi.org/10.1509/jmr.13.0593.

41. Falk EB, O'Donnell MB, Tompson S, Gonzalez R, Cin SD, Strecher V, Cummings KM, An L: **Functional brain imaging predicts public health campaign success**. *Soc Cogn Affect Neurosci* 2016, **11**:204-214 http://dx.doi.org/10.1093/scan/nsv108.

42. Rademacher L, Krach S, Kohls G, Irmak A, Gründer G, Spreckelmeyer KN: **Dissociation of neural networks for anticipation and consumption of monetary and social rewards**. *NeuroImage* 2010, **49**:3276-3285 http://dx.doi.org/10.1016/j.neuroimage.2009.10.089.

43. Bhanji JP, Delgado MR: **The social brain and reward: social information processing in the human striatum**. *WIREs Cogn Sci* 2014, **5**:61-73 http://dx.doi.org/10.1002/wcs.1266.

44. Cascio CN, Scholz C, Falk EB: **Social influence and the brain: persuasion, susceptibility to influence and retransmission**. *Curr Opin Behav Sci* 2015, **3**:51-57 http://dx.doi.org/10.1016/j.cobeha.2015.01.007.

45. Izuma K: **The neural basis of social influence and attitude change**. *Curr Opin Neurobiol* 2013, **23**:456-462 http://dx.doi.org/10.1016/j.conb.2013.03.009.

46. Sherman LE, Greenfield PM, Hernandez LM, Dapretto M: **Peer influence via Instagram: effects on brain and behavior in adolescence and young adulthood**. *Child Dev* 2018, **89**:37-47 http://dx.doi.org/10.1111/cdev.12838.

47. Izuma K, Saito DN, Sadato N: **Processing of social and monetary rewards in the human striatum**. *Neuron* 2008, **58**:284-294 http://dx.doi.org/10.1016/j.neuron.2008.03.020.

48. Klucharev V, Hytönen K, Rijpkema M, Smidts A, Fernández G: **Reinforcement learning signal predicts social conformity**. *Neuron* 2009, **61**:140-151 http://dx.doi.org/10.1016/j.neuron.2008.11.027.

49. Klucharev V, Munneke MAM, Smidts A, Fernandez G: **Downregulation of the posterior medial frontal cortex prevents social conformity**. *J Neurosci* 2011, **31**:11934-11940 http://dx.doi.org/10.1523/JNEUROSCI.1869-11.2011.

50. Christopoulos V, Schrater PR: **Dynamic integration of value information into a common probability currency as a theory for flexible decision making**. *PLoS Comput Biol* 2015, **11**:e1004402 http://dx.doi.org/10.1371/journal.pcbi.1004402.

51. Levy DJ, Glimcher PW: **The root of all value: a neural common currency for choice**. *Curr Opin Neurobiol* 2012, **22**:1027-1038 http://dx.doi.org/10.1016/j.conb.2012.06.001.

52. Levy DJ, Glimcher PW: **Comparing apples and oranges: using reward-specific and reward-general subjective value representation in the brain**. *J Neurosci* 2011, **31**:14693-14707 http://dx.doi.org/10.1523/JNEUROSCI.2218-11.2011.

53. Abitbol R, Lebreton M, Hollard G, Richmond BJ, Bouret S, Pessiglione M: **Neural mechanisms underlying contextual dependency of subjective values: converging evidence from monkeys and humans**. *J Neurosci* 2015, **35**:2308-2320 http://dx.doi.org/10.1523/JNEUROSCI.1878-14.2015.

54. Louie K, Khaw MW, Glimcher PW: **Normalization is a general neural mechanism for context-dependent decision making**. *Proc Natl Acad Sci U S A* 2013, **110**:6139-6144.

55. Louie K, Glimcher PW, Webb R: **Adaptive neural coding: from biological to behavioral decision-making**. *Curr Opin Behav Sci* 2015, **5**:91-99 http://dx.doi.org/10.1016/j.cobeha.2015.08.008.

56. • Klein TA, Ullsperger M, Jocham G: **Learning relative values in the striatum induces violations of normative decision making**. *Nat Commun* 2017, **8**:16033 http://dx.doi.org/10.1038/ncomms16033
The study described by Klein *et al.* is an excellent example of an empirical neuroimaging study that demonstrates the context-dependence of value-based decision making. The authors show that novel choice contexts lead to choices that are incongruent with previously learned choice algorithms. Instead, the evidence suggests that decision-makers value choice options relative to previously encountered options and that this relative option value is encoded in the neural value system.

57. Doré BP, Scholz C, Baek EC, Falk EB: **Brain activity predicts population information sharing by capturing consensus judgments of value**. *Cereb Cortex* 2019, **28**:3102-3110 http://dx.doi.org/10.1093/cercor/bhy176.

58. Barasch A, Berger J: **Broadcasting and narrowcasting: how audience size affects what people share**. *J Mark Res* 2014, **51**:286-299 http://dx.doi.org/10.1509/jmr.13.0238.