Emotionally Numb: Expertise Dulls Consumer Experience

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Expertise provides numerous benefits. Experts process information more efficiently, remember information better, and often make better decisions. Consumers pursue expertise in domains they love and chase experiences that make them feel something. Yet, might becoming an expert carry a cost for these very feelings? Across more than 700,000 consumers and 6 million observations, developing expertise in a hedonic domain predicts consumers becoming more emotionally numb—that is, having less intense emotion in response to their experiences. This numbness occurs across a range of domains—movies, photography, wine, and beer—and across diverse measures of emotion and expertise. It occurs in cross-sectional real-world data with certified experts, and in longitudinal real-world data that follows consumers over time and traces their emotional trajectories as they accrue expertise. Furthermore, this numbness can be explained by the cognitive structure experts develop and apply within a domain. Experimentally inducing cognitive structure led novice consumers to experience greater numbness. However, shifting experts away from using their cognitive structure restored their experience of emotion. Thus, although consumers actively pursue expertise in domains that bring them pleasure, the present work is the first to show that this pursuit can come with a hedonic cost.

Keywords: expertise, emotion, hedonic, consumer knowledge, language, attitudes

Consumers crave expertise. Photography experts research the latest developments in equipment and how to best deconstruct the composition of a photograph. Cinephiles attend the latest films, read critics' reviews, and debate the films' merits endlessly online. Elsewhere, consumers pay thousands of dollars to take wine, coffee, and music classes (Gaiter and John 2006; Voght 2017). Consumers pursue knowledge for the things they love. This pursuit might be explained, in part, by the idea that expertise further enriches the feelings and experiences that naturally arise in hedonic domains such as film, music, and wine (Alba and Williams 2013; Hirschman and Holbrook 1982). Yet, might this very knowledge also carry a hedonic cost?

In this work, we propose that the acquisition of expertise can produce an ironic effect when it comes to the very feelings and emotions that consumers pursue. Specifically, in this article, we explore the idea that expertise can lead to an emotional numbness—that is, experience less intense emotion within hedonic domains. Take, for example, movie buffs who learn everything they can about Stanley Kubrick films because they love and want to know everything they can about them. We suggest that acquiring and

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applying knowledge to scrutinize and dissect future Kubrick films can ultimately undermine expert consumers' emotional experience during future viewings.

Thus, while expertise has numerous benefits (Alba and Hutchinson 1987; Hutchinson and Eisenstein 2008), the present work reveals it can carry a toll of emotional numbness. In doing so, this research introduces a novel insight that accompanies consumer expertise, which directly informs the emotional value—or lack thereof—people experience from products and services.

EXPERTISE

The Benefits of Expertise

Expertise provides many benefits, such as the ability to process information more efficiently (Johnson and Mervis 1997), remember information better (LaTour and LaTour 2010), and often make better decisions (Mitchell and Dacin 1996). One explanation for these benefits centers on the cognitive structure consumers develop and actively apply as they gain experience in a domain (Alba and Hutchinson 1987). Cognitive structure refers to the knowledge that consumers build and the organization of that knowledge in memory as they learn about a product domain (Hutchinson and Alba 1991). Indeed, expertise consists of more extensive knowledge (cognitive structure) within a domain and the application of this knowledge (cognitive processes) to successfully complete product-related tasks (Alba and Hutchinson 1987; Shanteau 1992).

Take, for instance, wine connoisseurs who are interested in finding a new wine to drink. They are likely to have developed knowledge for the facets of wine (e.g., grape variety, region of origin) and how those work together to make a specific taste (e.g., acidity, dryness, light- vs. full-bodied). They can apply this knowledge to understand the facets to search for and then use them to identify the optimal wine for their occasion (Clarkson, Janiszewski, and Cinelli 2013). Thus, cognitive structure allows consumers to understand how to comprehend and engage with products from a given domain (Spence and Brucks 1997).

As this example illustrates, cognitive structure facilitates consumers' use of an analytical approach to understand a product domain (Alba and Hutchinson 1987). That is, knowledge allows consumers to decompose products into their different parts and discriminate among them based on diagnostic characteristics within that product domain (Hutchinson and Alba 1991). The more knowledge consumers have in a domain, the more they can apply this knowledge to understand the attributes of the product and whether these properties indicate a product is of high or low quality (Dillon et al. 2001). Novices, who lack the same degree of knowledge, are less able to engage with and assess a product and its attributes in the same way or to the same extent (Spence and Brucks 1997).

The possession and application of knowledge helps explain experts' ability to recognize important patterns across time (Chase and Simon 1973), store those instances in memory (West, Brown, and Hoch 1996), and retrieve them when making decisions (LaTour and LaTour 2010). In doing so, it can increase consumers' efficiency when searching for high-quality products in that domain in the future (Hutchinson and Alba 1991) and increase the probability that search is successful (Spence and Brucks 1997).

In short, the benefits of expertise are, in large part, attributable to the development of cognitive structure—knowledge and its organization—and the analytical approach that involves the application of this cognitive structure. Yet, might this very knowledge have drawbacks?

The Costs of Expertise

The consumer literature has painted a particularly positive picture of expertise. However, in doing so, less research has focused on understanding its potential costs. Research that does exist on costs has focused almost exclusively on expertise's cognitive consequences—that is, on the beliefs that consumers hold. For example, research has shown that across numerous domains—from medicine to law—experts often believe they perform better and have better accuracy in decision-making than they actually do, which can lead to less careful decision-making (Alba and Hutchinson 2000; Lichtenstein, Fischhoff, and Phillips 1982; Shanteau and Stewart 1992). Experts can also be more subject to cognitive biases they have accrued as they developed their knowledge (Alloy and Tabachnik 1984; see also Wood and Lynch 2002). This prior emphasis on the cognitive drawbacks to expertise makes sense given that expertise itself consists of knowledge and its use in analytical thinking, which experts use to form their beliefs within a domain.

Yet, in focusing on the cognitive consequences of expertise, researchers have overlooked its potential hedonic consequences. In other words, the consequences for the feelings consumers have while engaging with the category. Indeed, scholars have recently observed that there is a lack of research that explores how expertise shapes consumers' hedonic gratification (LaTour and Deighton 2019). As an example of this lack of attention, the seminal work on the dimensions of expertise by Alba and Hutchinson (1987)—cited ~6,500 times (Google Scholar)—makes no reference at all to "hedonic" or "emotion." Recent research has focused on how positive or negative experts are compared to novices (Nguyen et al. 2021), but this work focuses on review valence and not the feelings experienced by experts.

In this article, we propose that the development of expertise can ultimately carry a cost of making consumers more emotionally numb. Why might this occur? Consider how a professional photographer (an expert) versus an everyday consumer (a novice) might view a photograph of a

cuddly puppy. Professional photographers report that they are more likely to apply their knowledge to examine whether the photograph was taken in optimal lighting, whether it was at an ideal angle, how well it conveyed some sort of meaning, etc. (Sethna 1992). The photographers' knowledge that appropriate lighting and angles are diagnostic characteristics of a high-quality photograph allows them to analytically dissect the photograph into its constituent parts and then discriminate among photographs in a manner the novice cannot (Dillon et al. 2001; Spence and Brucks 1997).

Indeed, experts' default tendency is to use this knowledge-based, analytical approach within their domains of expertise (Alba and Hutchinson 1987; Maciel and Wallendorf 2017). Although this approach can lead experts to identify and select high-quality photographs, we suggest that it might ultimately deprive the expert of the hedonic experience. Novices, on the other hand, are more likely to engage with the photograph based on the spontaneous feelings it evokes, in large part because they do not have the same knowledge to apply to the photograph. Thus, while experts' passion leads them to develop cognitive structure for photography, applying their knowledge may ultimately rob them of part of the emotional experience and render them more emotionally numb.

Neither this idea of emotional numbness nor the underlying process has been tested empirically. However, some qualitative evidence supports the possibility of the proposed process. Specifically, wine tasting classes commonly require consumers seeking expertise to analyze a wine by decomposing it into its parts—for example, aroma, appearance—to come to a more objective understanding of that wine and its facets (Court of Master Sommeliers 2016; Noble et al. 1987). In doing so, they emphasize the development and application of cognitive structure that may undermine, and thereby numb, people's more emotional reactions. Similarly, research on the development of expertise in craft beer has found that consumers build their knowledge to facilitate the analytical dissection of each beer to examine its constituent parts (e.g., aroma, appearance; Maciel and Wallendorf 2017). In other words, consumers apply their knowledge in a domain to take an analytical approach toward their hedonic consumption. Yet, it remains an open question as to whether this approach undermines consumers' hedonic experience.

To summarize, experts' knowledge facilitates the analytical dissection of a product. Our proposition is that this application of knowledge can undermine consumers' hedonic experience. Although not studied in the development of expertise, research has shown that more analytical, deliberative processing can blunt emotional intensity compared to a more spontaneous mode of processing (Mischel and Shoda 1995). For example, deliberation has been shown to decrease emotional intensity in reaction to both consumer food choices and emotional advertising (Shiv and Fedorikhin 1999; Small, Loewenstein, and Slovic 2007). Of particular relevance to our proposition, research has shown that taking an analytical approach to craft beer tasting can decrease feeling engaged in the tasting experience (LaTour and Deighton 2019).

OVERVIEW AND CONTRIBUTION

Although experts initially pursue what they love, the present work tests the proposition that the development and application of expertise in a hedonic domain can ultimately lead to emotional numbing. To test our proposition, we use a combination of field studies and lab experiments. Across four experiments and three field studies that include over 700,000 consumers and 6 million observations, we show that as consumers accrue and then apply knowledge in a hedonic domain, they become more emotionally numb to their experiences. This outcome occurs across a wide range of domains—movies, photography, wine, and beer—and for multiple measures of both emotion and expertise.

We show this emotional numbness in cross-sectional real-world data with certified experts, and in longitudinal real-world data by following consumers over time and tracing their emotional trajectories as they accrue expertise. We also use controlled experiments to demonstrate that this numbness can be explained by the knowledge experts develop and apply to dissect the product during their experience. Finally, based on our understanding of this process, we show that experts are not inevitably bound to be emotionally numb. When we help guide experts to focus on the hedonic aspects of their consumption experience, they can regain their feeling. Together, the present research provides the first demonstration of the emotional costs of the development expertise and extends our knowledge of how expertise shapes and influences consumer experiences. In line with open science practices, we have reported all measures, conditions, data exclusions, and sample size determinations.

STUDY 1: EMOTIONAL REACTIONS OF NOVICES VERSUS EXPERTS

Study 1 provided an initial test of our proposition that expertise can lead to emotional numbness. To that end, we used real-word data that featured online reviews of nearly 9,000 films to assess the degree of emotionality demonstrated by novices versus certified experts.

Method

Data. We obtained reviews from the film review website RottenTomatoes.com for all films released from 2004 until 2017—13 years of data. These films included those all the way from "blockbuster" hits (e.g., Star Wars,

Jurassic World) to documentaries and "indie" films (e.g., Freakonomics: The Movie, Ex Machina).[1]

The reviews were written by both novice film watchers and professional film journalists. Reviews from novices were written by everyday consumers who had left a review on the Rotten Tomatoes website. Experts, on the other hand, were required to meet qualifications set by Rotten Tomatoes. For example, Rotten Tomatoes required that experts be affiliated with a publisher that received a minimum of 2 million visits across a 6-month period to their website or to be affiliated with a major broadcast network (Rotten Tomatoes 2020). Experts meeting these requirements were invited or allowed to apply by Rotten Tomatoes to have their reviews included on the Rotten Tomatoes website. Together, there were 642,681 novices and 5,780 experts who wrote a combined 3,009,095 reviews across 8,627 unique films.

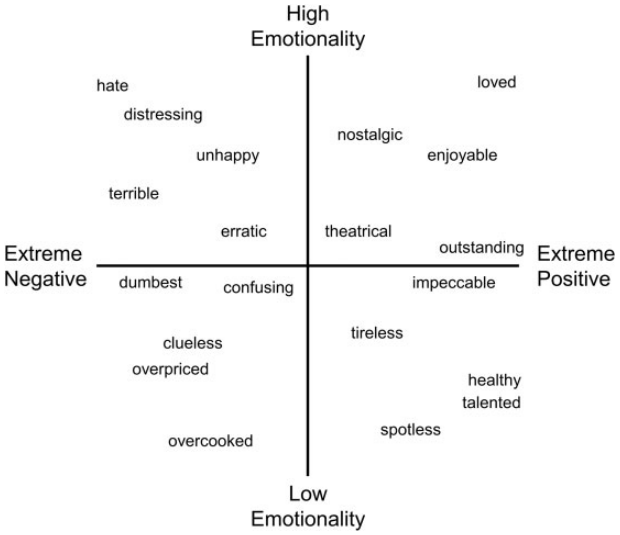
Measurement: The Evaluative Lexicon. We used the Evaluative Lexicon (EL) to measure each user's level of emotion (Rocklage and Fazio 2015; Rocklage, Rucker, and Nordgren 2018a). The EL is a computational linguistic tool that measures the valence, extremity, and emotionality of individuals' reactions in text. To quantify text, the EL uses a large list of evaluative words such as "loved," "outstanding," "distressing," and "overpriced." Each of these words has been rated by a large set of external judges for its implied valence (0 = very negative, 9 = very positive), valence extremity [the absolute distance from the midpoint (4.50) of the valence scale], and emotionality (0 = not at all emotional, 9 = very emotional). Thus, the EL measures the positivity (valence) of consumers' opinion, how positive or negative it is (extremity), and the extent to which it is based on an emotional reaction (emotionality).

To provide an example of these different dimensions, consider the words "enjoyable" and "impeccable." Both words imply a positive and equally extreme reaction [both score ~7.50 on valence and 3.00 out of 4.50 on extremity (absolute value of 7.50 − 4.50) by the external raters]. However, "enjoyable" is a reaction that indicates much greater *feeling* compared to "impeccable" (these score 6.58 and 4.27 out of 9.00 on emotionality, respectively). Put differently, consumers who use the word "enjoyable" versus "impeccable" would be equally positive in their reaction but differ in the extent to which that positivity is emotional. Similarly, "distressing" and "overpriced" are similar in their negativity (~1.50 on valence and 3.00 on extremity), but the terms differ in their emotionality (7.34 and 2.70 out of 9.00, respectively). See figure 1 for additional examples.

These underlying numerical values are then used in place of the word—that is, imputed—when the word is encountered in real-world text (Rocklage et al. 2018a). For example, if consumers write, "This film was enjoyable, I loved it," they would receive an average emotionality score of 7.42 given "enjoyable" has an emotionality score of 6.58 and "loved" a score of 8.26 [(6.58 + 8.26)/2]. These words would also receive a separate extremity score of 3.32 [(3.02 + 3.62)/2].

FIGURE 1

EXAMPLES OF EVALUATIVE LEXICON WORDS AND THEIR RELATIVE POSITION ON VALENCE, EXTREMITY, AND EMOTIONALITY



The EL has been shown to be a valid measure of emotionality across a wide range of topics and domains (Rocklage et al. 2018a) and has been used extensively for both in-lab studies as well as real-world online reviews and social media (Kteily et al. 2019; Rocklage, Rucker, and Nordgren 2018b; software available at www.evaluativelexicon.com). Moreover, the EL has been differentiated from other linguistic tools such as LIWC (Pennebaker et al. 2015) and the Hedonometer (Dodds and Danforth 2010). Whereas LIWC and the Hedonometer have been shown to measure the *valence* of individuals' language (Reagan et al. 2017; Rocklage et al. 2018a), the EL measures valence, extremity, and emotionality. To be included in the analysis, a review had to have at least one word from the EL. This produced a sizeable number of reviews for both novices ($N = 2{,}613{,}117$) and experts ($N = 395{,}978$).

Following past work, we used the EL to impute and average the emotionality ($M = 4.83$ out of 9.00, SD = 1.27) from the language in each review (Rocklage et al. 2018a). We also imputed and averaged how positive or negative the language of the reviews were (their extremity; $M = 2.87$ out of 4.50, SD = 0.69). This second analysis

1 Due to a glitch on the Rotten Tomatoes website itself, in some cases our analysis was limited to the most-recent 51 pages of reviews.

allowed us to control for the possibility that, as they gain expertise, consumers become less positive or negative toward a given film and that this change could account for any differences in emotionality. Of note, prior research has found that emotionality and extremity are correlated constructs but are separable and important to differentiate (Rocklage and Fazio 2015; Rocklage et al. 2018a). Indeed, as we note above, extremity reflects how positive or how negative consumers are, whereas emotionality is the extent to which that positivity/negativity is based on an emotional, feeling-based reaction. Although a reduction in extremity is interesting in its own right (Nguyen et al. 2021), this is separate from our proposition that expertise decreases the *emotion* consumers experience. As such, we assessed emotionality by examining differences in emotionality controlling for the extremity of the reviews.

Measurement: Additional Review and Film Characteristics. We also measured the length of each review (number of words written) to assess the effect of emotionality beyond any differences in review length ($M = 50.14$, SD = 99.68). As seen by the relative sizes of the mean and standard deviation, a skew exists such that the majority of reviews were relatively short, but a smaller subset had a large number of words. We therefore log transformed this variable to approximate a more normal distribution for analyses (Fazio 1990).

We also controlled for facets of the films for purposes of robustness and generalizability. Specifically, we controlled for the year the film was released ($M = 2{,}010$, SD = 3.93) and its genre ($N = 16$; e.g., drama, documentary, musical).[2] Equally important, we calculated the normative emotionality each film evoked (the average emotionality expressed across all reviews for a given film). Controlling for this variable is the same as adding a fixed effect for each of the 8,627 films (Hamaker and Muthén 2020), which allows us to provide evidence against the possibility that certain films account for differences between novices and experts.

Results

We used mixed-effects modeling and nested reviews within films.[3] This approach accounts for the fact that each film is reviewed by multiple consumers and thereby models the variance associated with films. By specifically accounting for this variance, mixed-effects modeling increases the generalizability of the findings to films outside the current sample (Nezlek 2011). As indicated above, we further combine this with a more conventional econometrics approach by including fixed effects (Hamaker and Muthén 2020).

We report the results of multiple models in table 1. As seen in this table, experts consistently demonstrated less emotionality across the different models. These results held beyond how positive or negative consumers were (their extremity), the length of their review, the year the film was released, the normative emotionality of the film, and its genre. These results also held when predicting just positive emotion or just negative emotion from reviewers (see "positive" and "negative emotion only" rows in table 1). In other words, experts demonstrated greater numbness across both positive and negative emotion.

As an additional robustness test, we examined whether the effect held for a reviewer's *most* emotional reaction. It is possible, for instance, that experts add unemotional language to their reviews to offer greater explanation of the film. An expert may express that a film was "delightful" (an emotional reaction) and then explain that this reaction was due to the film's "sophisticated" and "inventive" nature (relatively unemotional reactions). What would appear to be numbing might, in fact, simply be greater explanation of the film. Model 4 of table 1, however, provides evidence against this possibility: even experts' *most* emotional reaction failed to reach the same heights of novices' most emotional reaction.

Discussion

This study used real-world data from novices versus certified experts and found evidence that experts were indeed more emotionally numb than novices. These results were robust across several different analyses and with a number of different controls.

Although the results are robust, one limitation is that experts' reactions may be influenced by their self-presentational concerns. Experts may have a similar emotional experience but seem emotionally numb due to a goal to appear more professional in their reviews. However, as we report in the web appendix, even when controlling the professionalism and formality of their language, experts remained significantly more emotionally numb than novices. Nevertheless, we further assess this alternative explanation in the following studies where consumers should have few self-presentational concerns.

STUDY 2: MEASURED EXPERTISE AND EMOTIONAL NUMBNESS

Study 2 sought to conceptually replicate and extend the findings from study 1. Specifically, as opposed to relying on external assignments of expertise (i.e., from Rotten Tomatoes), we used a standard measure of self-reported expertise used in the marketing literature. This approach has the advantage of providing converging evidence with

2 Some films were listed with multiple genres and, thus, the analyses use the first genre listed on the film's Rotten Tomatoes page.

3 We nest within films given our conceptual question is the effect of expertise holding a given product constant. However, effects are similar in direction, and larger in magnitude, when nesting reviews within consumers.

TABLE 1

EFFECT OF FILM EXPERTISE (EXPERTS VS. NOVICES) ON EMOTIONALITY, STUDY 1

	Primary model (1)	With controls (2)	With genre (3)	Predicting peak emotionality (4)
Primary predictor				
Experts (vs. novices)	−0.126*** (0.002)	−0.131*** (0.002)	−0.132*** (0.002)	−0.241*** (0.002)
Positive emotion only	−0.107*** (0.002)	−0.127*** (0.002)	−0.127*** (0.002)	−0.218*** (0.003)
Negative emotion only	−0.151*** (0.003)	−0.158*** (0.003)	−0.160*** (0.003)	−0.184*** (0.003)
Control variables				
Review extremity	0.858*** (0.001)	0.842*** (0.001)	0.843*** (0.001)	1.073*** (0.001)
Review length		−0.104*** (0.001)	−0.105*** (0.001)	0.560*** (0.002)
Year film released		0.004*** (0.001)	0.004*** (0.001)	0.009*** (0.001)
Normative film emotion		0.675*** (0.004)	0.671*** (0.004)	0.767*** (0.006)
Genre fixed effects	No	No	Yes	Yes

NOTES.—***$p \leq .001$; experts (vs. novices): 0 = novices, 1 = experts; all other predictor variables are unstandardized. Review extremity is the weighted average extremity for each review except for in model 4 where we control for the most extreme word in order to match the most emotional word. Standard errors are in parentheses.

study 1 while also strengthening the current work's connection with prior research on expertise (Carlson et al. 2009). In addition, we sought to increase the generalizability of the effect by using a more controlled, laboratory-based paradigm and testing it in a new domain where consumers commonly develop expertise: photography.

Method

Procedure Overview. Participants were shown a set of photographs from the Open Affective Standardized Image Set (OASIS; Kurdi, Lozano, and Banaji 2017). They were asked to indicate their reaction to each photograph using an EL checklist (Rocklage and Fazio 2015, 2016, 2018). This checklist provided participants with a large set of adjectives that ranged from positive to negative and from high to low emotionality. For example, the word "delightful" implies positivity and high emotionality whereas the word "inferior" implies negativity and low emotionality (see figure 1). Participants first selected two to four adjectives that described their reaction to the photograph. Then, among their selected adjectives, participants were asked to indicate the single adjective that *best* described their reaction. The emotionality of participants' reactions constituted our dependent variable. Participants then reported their expertise in photography.

Participants. Although we did not have strong predictions regarding the size of the effect, prior research using a similar repeated-measures approach obtained reliable effects with as few as 44 participants (Rocklage and Fazio 2016, 2018). For adequate power, we aimed to recruit 100 participants. Participants were recruited via Mechanical Turk ($N = 102$; $M_{age} = 35.87$, $SD_{age} = 10.88$; 55% male, 45% female).

Materials: Photographs. All photographs came from the OASIS database (Kurdi et al. 2017). This database includes a large set of photographs that have been rated by ~100 participants on their normative valence (negative to positive) and the extent to which they are emotionally arousing (low to high).

From this database, we used 20 diverse photographs that met two criteria. First, we selected an even number of positive and negative photographs (those above and below the midpoint of the valence scale, respectively) to assess whether any relationship between expertise and emotionality held across valence. Second, given we were interested in the numbing effect of expertise on emotionality, we selected photographs that were rated in the top 20% on normative emotional arousal (>4.40 out 7.00). This approach helped to ensure the photographs would evoke an emotional reaction so as to discern any differences between novices and experts that may exist—that is, we selected photographs where there was an emotional reaction that could be numbed. The final photographs ranged from positive photographs of a puppy and fireworks to negative photographs of a caged dog and a building on fire.

Of these 20 photographs, each participant was shown a different, randomly selected subset of 10—five positive and five negative—photographs. Showing a different subset of photographs to each participant utilizes a stimuli-within-block design (Westfall, Kenny, and Judd 2014), which helps decrease fatigue for any given participant while increasing the generalizability of the results across a larger number of stimuli. We paired this design with mixed-effects modeling to model the variance attributable to both participants and photographs to further enhance the generalizability of the findings (Baayen, Davidson, and Bates 2008). Taken together, there were a total of 1,020 observations (102 participants and 10 observations per participant).

Materials: Measuring Emotionality. Participants were asked to give their reaction to each photograph using an EL checklist (Rocklage and Fazio 2015, 2016, 2018). This checklist contained a list of 42 adjectives that provided

participants the ability to indicate a wide range of positivity ("exciting") to negativity ("undesirable") and high emotionality ("amazing") to low emotionality ("superior"). Given the EL quantifies each word in terms of its implied valence, extremity, and emotionality, we used participants' selections to measure these facets of their reactions. As noted previously, participants were asked to select two to four adjectives that described their reaction and then, from this subset, a single adjective that *best* described their reaction. The average emotionality of participants' two to four adjectives was 6.06 (SD = 0.70) and the average extremity was 3.31 (SD = 0.36). The average emotionality of participants' best adjective was 6.25 (SD = 1.11) and the average extremity was 3.40 (SD = 0.53).

Materials: Expertise. At the end of the study, participants indicated their expertise in photography. To measure expertise, we followed recommendations from Carlson et al. (2009) whose research indicates that self-reported expertise can best approximate objective measures of expertise by asking participants, "Compared to an expert, how much expertise do you have in photography?" (1 = no expertise at all; 7 = a great deal of expertise) and, "Compared to an expert, how would you rate your knowledge of photography?" (1 = not at all knowledgeable; 7 = very knowledgeable). These items were strongly correlated [$r(100) = 0.92$, $p < .001$] and therefore averaged together ($M = 3.66$, SD = 1.81).

Results

We used two mixed-effects models to predict participants' emotionality as measured by (1) their averaged and (2) single best adjectives. As in study 1, in each model we included how positive or negative participants' reaction was (its extremity) and their expertise. We also examined whether the effects of expertise differed for positive versus negative photographs by including an expertise by valence interaction. We did not observe a significant interaction when predicting the emotionality of either participants' averaged [$\gamma = 0.01$, $t(900.51) = 1.23$, $p = .22$] or single best adjectives [$\gamma = 0.02$, $t(901.028) = 1.53$, $p = .13$]. Thus, valence and its interaction were not included in the subsequent models.

Regarding participants' averaged adjectives, as would be expected, the more positive or negative participants' reaction (its extremity), the more emotional it was [$\gamma = 1.04$, $t(1{,}011.32) = 20.20$, $p < .001$]. Beyond this result, the more expertise a consumer had, the less feeling they had in reaction to each photograph [$\gamma = -0.03$, $t(99.55) = 2.78$, $p = .007$]. These results replicated for participants' single best adjective. Again, more extreme reactions were also more emotional [$\gamma = 1.12$, $t(1{,}014.96) = 20.64$, $p < .001$]. Most importantly, beyond extremity, greater expertise predicted less feeling in reaction to each photograph [$\gamma = -0.05$, $t(100.21) = 2.99$, $p = .003$].

As reported in the web appendix, we found evidence against the possibility that experts have less feeling due to boredom or satiation with photography (Frederick and Loewenstein 1999; Galak and Redden 2018; Redden 2008). Those with high expertise showed high and consistent engagement across the task and, if anything, showed greater engagement than those with low expertise. This sustained engagement provides evidence that the differences in emotionality are not attributable to boredom or satiation. We also directly examine boredom in subsequent experiments and do not find support for this account. For parsimony, all analyses related to boredom are reported in the web appendix.

Discussion

Using a standard measure of self-reported expertise, we found evidence for emotional numbness among photography experts.

STUDY 3: THE ACTIVE APPLICATION OF DOMAIN-SPECIFIC KNOWLEDGE

Having established the initial relation between expertise and numbness, we next sought to experimentally test the mechanism we have put forth. As a reminder, as consumers learn and build knowledge, they can apply this knowledge to decompose and understand the quality of a given item (Hutchinson and Alba 1991). However, we propose that this development and application of knowledge within a hedonic domain leads to emotional numbing by supporting consumers' dissection of the item, thereby hindering its innately hedonic nature.

To test this mechanism, we manipulated the availability of domain-specific knowledge. We hypothesized that participants who reported actively applying this knowledge should show the greatest emotional numbness, whereas those who did not apply the knowledge should show relatively little numbness. To test these hypotheses, we used a similar procedure as in study 2, but this time we randomly assigned participants to one of two conditions.

In the primary experimental condition, participants completed a "Photography 101" learning module. Specifically, participants learned the different characteristics of photographs that experts use to dissect and come to an understanding of a photograph's quality. Though these participants certainly do not become experts, the learning module should offer sufficient knowledge to apply to the photographs and therefore test whether the use of knowledge leads to emotional numbness. Put differently, this condition allowed us to manipulate the proposed underlying psychological process—the possession and use of

knowledge—and thus allowed a test of our mechanism via moderation (Spencer, Zanna, and Fong 2005).

We also designed this experiment to explore whether emotional numbness occurs as a result of the acquisition and application of *any* knowledge, even knowledge outside of the domain of interest. Such a result could occur if acquiring knowledge about any domain leads people to adopt a more analytical processing style (Novak and Hoffman 2009). Although possible, our proposition is that the knowledge consumers develop *within* the domain should allow participants to be particularly effective in dissecting objects in that domain and thus be especially impactful for numbness. To test this possibility, we varied whether people acquired knowledge focal to the domain of interest or knowledge in another domain (wine).

With our basic effects established in the previous studies (see also study W1 in the web appendix), we pre-registered the current experiment and these hypotheses (https://osf.io/f4cu8/).

Method

Procedure Overview. To test our hypotheses, we used a common design from education research called a randomized pretest–posttest with control group design (Fraenkel, Wallen, and Hyun 2018). Across the experiment, participants saw 12 photographs from the OASIS database. All participants began by providing their reactions to six randomly selected photographs using an EL checklist (the pretest). Next, half of the participants were randomly assigned to a condition where they went through a photography learning module (see below for details). The other half of the participants went through a control learning module where they also gained knowledge, but for wine. All participants then provided their reaction to six randomly selected photographs they had not seen previously (the posttest). Finally, at the end of the experiment, we asked all participants to report the extent to which they actively applied their knowledge of photography when reacting to the photographs.

Participants. Participants were recruited via Mechanical Turk in line with our pre-registration ($N = 601$; $M_{age} = 39.69$, $SD_{age} = 12.98$; 43.6% male, 56.1% female, 0.3% preferred not to say).

Materials: Experimental Conditions. After providing their reactions to six photographs, half of the participants were randomly assigned to a photography learning module. This "Photography 101" learning module taught them the characteristics that experts use to decompose and understand the quality of a photograph. Specifically, we asked participants to learn about photography by using guidelines put forth in the *Royal Photographic Society Journal* (Sethna 1992), the oldest photography periodical in the world (Gernsheim 1984). We provided participants with three major aspects of a photograph that experts attend to as put forth in these guidelines: what the photograph communicates (e.g., does the picture communicate a statement or story? If so, how well does it do this?), the content of the photograph and how it is dealt with (e.g., is there juxtaposition of tones and colors and do they contribute to the subject?), and the technical aspect of the photograph (e.g., was the sharpness correct? That is, is the picture sharp or blurry?). As a cover story, we told participants we were using the learning module to give them a break and to help us understand how easy the module is to learn.

The other half of participants were assigned to an equivalent learning module on wine. Similar to those in the photography condition, we told participants the learning module was to give them with a break and to help us understand how easy the module is to learn. These participants were provided with three general characteristics that wine experts use to understand the quality of wine based on *The Wine Advocate* rating system created by Robert Parker (Parker 2020), who is considered one of the world's most influential wine critics (Langewiesche 2000; McCoy 2006). Specifically, participants learned that wine experts assess a wine's appearance [e.g., what color is it? Does the color fit with what is standard for a wine of this type (e.g., red vs. white)?], its aroma (e.g., does the wine have a fresh smell or does it have a vinegary or metallic smell?), and its taste (e.g., is the wine full-bodied or more watery?).

Materials: Photographs. The same photographs from the OASIS database were used as in study 2. However, in this experiment each participant saw 12 randomly selected photographs—six positive and six negative. Six photographs were shown prior to the learning module and six were shown after the learning module. There was a total of 7,212 observations (601 participants and 12 observations per participant).

Materials: Measuring Emotionality. The same EL checklists were used as in study 2. As pre-registered, given results in study 2 were similar for both participants' averaged and single best adjectives, we simplified the task and asked participants to select two to four adjectives for each photograph (i.e., they were not asked to identify their single best adjective). The average emotionality was 6.08 (SD = 0.72) and the average extremity was 3.31 (SD = 0.37).

Materials: Use of Knowledge. At the end of the experiment, we asked all participants two questions to assess the extent to which they actively used any knowledge they had regarding photography: "In the final photograph section of the study, to what extent did you consider criteria that would be important to experts when evaluating the photographs?" (1 = not at all; 7 = very) and "In the final photograph section of the study, to what extent did you evaluate the photographs in a manner similar to how an expert might?" (1 = not at all similar; 7 = very similar). These

items were strongly correlated [$r(599) = 0.77$, $p < .001$] and therefore averaged together ($M = 3.95$, SD = 1.59).

Results

As pre-registered, we tested whether the change in emotionality was strongest for those had who had actively applied the knowledge they had gained after going through the photography learning module. Thus, we used mixed-effects modeling to predict participants' emotionality as a function of their condition, pre/post-learning, and their reported use of expert knowledge (i.e., condition × pre/post-learning × use of knowledge). We controlled for how positive or negative participants' reactions were (their extremity) to examine emotionality per se.

As before, extreme reactions were more emotional [$\gamma = 1.15$, $t(7,152.29) = 62.19$, $p < .001$]. Beyond this, there was a significant three-way interaction between condition, pre/post-learning, and use of knowledge [$\gamma = -0.01$, $t(6,587.68) = 2.91$, $p = .004$]. As hypothesized, within the photography condition, there was a significant pre/post-learning × use of knowledge interaction [$\gamma = -0.02$, $t(6,587.94) = 2.78$, $p = .006$]. This interaction indicated that there was a strong decrease in emotionality for those who reported using the knowledge [+1 SD; $\gamma = -0.05$, $t(6,587.40) = 3.99$, $p < .001$], but no significant decrease in emotionality for those who did *not* use the knowledge [−1 SD; $\gamma = 0.006$, $t(6,587.86) = 0.44$, $p = .66$; see figure 2].

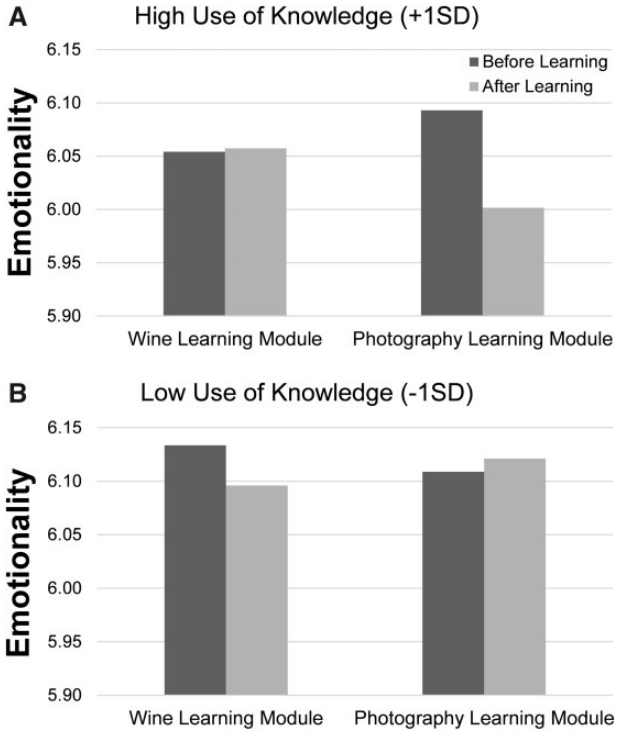
Conversely, those in the wine learning module showed no significant decrease in emotionality from pre- to post-learning [$\gamma = -0.009$, $t(6,587.53) = 0.98$, $p = .33$]. This null effect did not significantly differ by participants' self-reported use of their knowledge [$\gamma = 0.006$, $t(6,588.99) = 1.24$, $p = .22$]. These results indicate that gaining knowledge in a separate hedonic domain (wine) did not decrease emotion in the focal photography domain.

Discussion

Using an experimental design and a pre-registered analysis plan, study 3 demonstrated that consumers' knowledge decreases emotionality. Moreover, we found that the effect was present only for those reporting that they used the domain-specific knowledge they learned. As such, this result indicates that it is not solely about exposure to cognitive structure or knowledge, but it is the active application that explains the emotional numbness of expertise. These results also demonstrated that providing knowledge within an unrelated hedonic domain is not sufficient for decreases in emotionality. Emotional numbness was a result of the application of domain-specific knowledge.

FIGURE 2

EFFECT OF LEARNING ON EMOTIONALITY, STUDY 3



STUDY 4: DIRECTLY MANIPULATING THE APPLICATION OF KNOWLEDGE

In the previous experiment, participants were allowed to freely apply their new knowledge or not. Although this had the benefit of simulating a real-world learning scenario where consumers often have the option to apply their knowledge or not, it limits our ability to make causal inferences about knowledge application. That is, it is possible that the results could be due to an unobserved variable that covaries with people's willingness to apply new knowledge or not. To address this issue experimentally, study 4 directly manipulated participants' application of knowledge.

Specifically, we used three conditions to create a continuum of the extent to which participants would apply their knowledge or not. Participants were either (1) given the photography learning module and directly asked apply their new knowledge, (2) given the photography learning module and allowed to freely choose to apply their knowledge or not, or (3) not given any learning. We hypothesized that there would be a decreasing effect of numbing across conditions, with those asked to apply their new knowledge showing the greatest emotional numbness, those given free choice showing middling emotional numbness, and those

not given any knowledge showing the least emotional numbness. Put differently, our hypothesis is that participants who are given the free choice to apply their knowledge would fall in the middle given that some would still apply the knowledge to some degree, but simply not as much as those instructed to explicitly do so. Moreover, we hypothesized that individuals' self-reported use of their knowledge would statistically mediate the effects on emotionality, thereby providing further evidence in favor of the causal nature of the effects.

We pre-registered this experiment and its hypotheses (https://osf.io/536sx/).

Method

Procedure Overview. Participants saw 10 randomly selected photographs from the OASIS database just as in study 2. They were randomly assigned to one of three conditions before seeing the photographs. Those in the "application condition" went through the photography learning module from study 3 and were explicitly instructed to apply that knowledge in the subsequent photography task. Those in the "free choice condition" also went through the photography learning module, but not explicitly instructed to apply that knowledge. Control participants were not given the learning module and simply asked to provide their reaction to each photograph. After each photograph, participants were shown the EL checklist from study 3 and asked to provide their reaction. The emotionality of these reactions constituted the primary dependent variable. Finally, participants reported the extent to which they actively used expert knowledge. This allowed us to examine the extent to which self-reported reliance on expert knowledge mediated the effect of condition on emotionality.

Participants. For adequate power, we aimed to recruit ~200 participants per condition across three conditions (600 total participants). Participants were recruited via Mechanical Turk ($N = 605$; $M_{age} = 37.56$, $SD_{age} = 11.66$; 43.1% male, 56.2% female, 0.7% preferred not to say).

Materials: Experimental Conditions. We used the same learning module as in study 3 for both the application and free choice conditions. Those in the application condition were asked to apply their learning in the photography task. Those in the free choice condition were told that we simply wanted to understand how clear the module was for future research. Participants in the control condition were not provided the learning module and were simply asked to indicate their reaction to each photograph.

Materials: Photographs. The same photographs from study 3 were used. All participants were shown 10 randomly selected photographs—five positive and five negative. There were a total of 6,050 observations (605 participants and 10 observations per participant).

Materials: Measuring Emotionality. We used the same EL checklist as in study 3. Participants selected two to four adjectives for each photograph. The average emotionality was 6.03 (SD = 0.75) and the average extremity was 3.30 (SD = 0.41).

Materials: Use of Knowledge. At the end of the experiment, participants indicated the extent to which they actively used the knowledge they gained from the learning module using the same items from study 3. These items were strongly correlated [$r(603) = 0.77$, $p < .001$] and therefore averaged together ($M = 4.21$, SD = 1.51).

Results

Emotionality. We used mixed-effects modeling to predict emotionality from condition. We controlled for how positive or negative participants were (their extremity) and dummy-coded condition and compared the three conditions to each other across two mixed-effects models.

As before, more extreme reactions were also more emotional [$\gamma = 1.11$, $t(6{,}042.77) = 58.65$, $p < .001$]. Beyond this effect, as hypothesized, those in the application condition were significantly less emotional than those in the control condition [$\gamma = -0.08$, $t(598.13) = 3.46$, $p < .001$]. In addition, those in the application condition were also significantly less emotional than those in the free choice condition [$\gamma = -0.05$, $t(597.25) = 2.18$, $p = .03$].[4] There was no significant difference between the free choice and control condition, though those in the free choice condition were in the direction of being less emotional [$\gamma = -0.03$, $t(596.45) = 1.24$, $p = .22$]. These effects were not significantly moderated by the valence of the photographs ($ps \geq .82$).

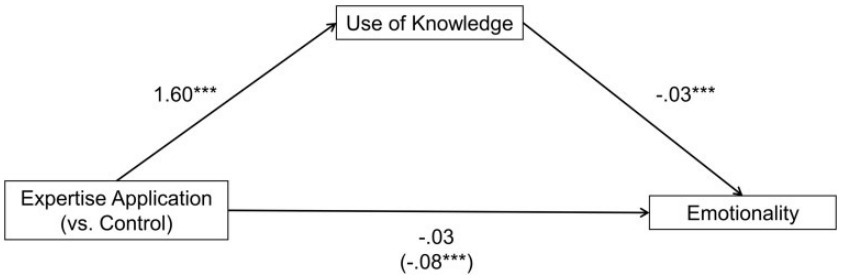
Mediation by Knowledge Use. We first examined whether the use of photography knowledge differed between conditions. An analysis of variance indicated that there was a significant effect of condition [$F(2, 602) = 72.14$, $p < .001$, $\eta^2_p = 0.19$]. All conditions differed significantly from one another ($ps < .001$) with those in the application condition reporting the greatest use of photography knowledge ($M = 5.11$, SD = 1.13), followed by the free choice condition ($M = 4.11$, SD = 1.38; Cohen's d vs. application = 0.80), and then the control condition ($M = 3.51$, SD = 1.51; d vs. application = 1.20, vs. free choice = 0.41).

Next, we examined the extent to which the differences in emotionality between conditions could be explained by their use of knowledge. We used the same mixed-effects models as in the primary analyses and additionally included participants' use of their knowledge to predict

4 For interested readers, we also find that in the free choice condition, the more participants reported using the new knowledge, the less emotional they were [$\gamma = -0.03$, $t(191.51) = 2.50$, $p = .01$].

FIGURE 3

MEDIATION MODEL SHOWING PATHWAY BETWEEN EXPERTISE, USE OF EXPERT KNOWLEDGE, AND DECREASED EMOTIONALITY, STUDY 4



NOTE.—***$p \leq .001$.

emotionality. Participants' use of photography knowledge was strongly predictive of decreased emotionality [$\gamma = -0.03$, $t(596.44) = 4.51$, $p < .001$]. Moreover, when accounting for use of knowledge, the differences between the application and control conditions [$\gamma = -0.03$, $t(596.65) = 1.19$, $p = .23$] and application and free choice conditions [$\gamma = -0.02$, $t(596.21) = 0.83$, $p = .41$] fell to nonsignificance.

To formally test mediation, we used the Monte Carlo method for assessing mediation in mixed models as put forth in prior research (Bauer, Preacher, and Gil 2006; MacKinnon, Lockwood, and Williams 2004). We simulated 20,000 samples to estimate the indirect effect. The resulting Monte Carlo 95% confidence interval did not contain zero for either the application (vs. control) [−0.08, −0.03] (see figure 3) or application (vs. free choice) conditions [−0.04, −0.02]. This provided evidence that condition had its effect on emotionality due to participants' use of their learning.

Discussion

Taken together, the results of this study provide both experimental and mediational evidence that the application of knowledge is pivotal for emotional numbing.

As reported in the web appendix (study W1), we replicated the primary findings from this experiment in an additional experiment ($N = 452$). In this additional experiment, we assessed emotional numbness using a different measure of emotion that has been validated as a measure of emotional intensity (Bradley and Lang 1994). Similar to the current experiment, participants who went through the photography learning module experienced significantly less intense emotion compared to those not provided with photography knowledge. In a third condition, we asked participants to act like an objective expert, but did not provide them with any additional knowledge. This condition did not produce the same decrease in emotional intensity, indicating that knowledge was necessary for numbness. Thus, these results conceptually replicate the current findings using a different measure of emotion. We report this experiment in the web appendix due to space considerations.

STUDY 5: EXPERTS CAN FEEL

Are experts inevitably bound to be emotionally numb? According to our conceptualization, possessing knowledge in and of itself does not lead to emotional numbness. Rather, it is implementing and using that knowledge that leads to numbness. As such, if our perspective holds, then experts should experience greater emotion if they shift away from applying their knowledge in the domain and instead refocus on any feelings the stimulus may evoke. Importantly, demonstrating that experts are capable of refocusing from using their knowledge toward the hedonic aspects of the stimulus would also provide a theory-driven boundary condition of the previous effects.

As a first test of this possibility, in the current study, we replicated the procedure of study 2, but we added a condition where participants were encouraged to focus on any feelings the photograph might be able to elicit. If emotional numbness is a result the application of knowledge—as opposed to simply the possession of knowledge—experts should show increased feeling in this hedonic focus condition.

Method

Procedure Overview. All participants saw 10 randomly selected OASIS photographs. Prior to viewing these photographs, participants were randomly assigned to one of two conditions. In the control condition, similar to study 2, participants were asked to provide their reaction to each

photograph and given no further instructions. In the "Hedonic Focus condition," participants were asked to focus on any feelings the photograph may have the ability to elicit. Participants provided their reaction to each photograph using the EL checklist from study 4. Then, participants reported how boring they found the task. Finally, participants indicated their photography expertise using the same measures as study 2.

Participants. For adequate power, we aimed to recruit 100 participants per condition via Mechanical Turk ($N = 196$; $M_{age} = 39.57$, $SD_{age} = 13.32$; 45.9% male, 53.1% female, 1.0% preferred not to say).

Materials: Experimental Conditions. Participants in the control condition, as in study 2, were asked to indicate their reaction to each photograph. In the Hedonic Focus condition, participants were asked to view the photographs and focus on any feelings the photographs may have the ability to elicit in them.

Materials: Photographs. The same photographs from study 2 were used. Participants were shown 10 randomly selected photographs. There were a total of 1,960 observations (196 participants and 10 observations per participant).

Materials: Measuring Emotionality. We used the same EL checklist as in study 2. Participants selected two to four adjectives for each photograph. The average emotionality was 6.08 (SD = 0.72) and the average extremity was 3.30 (SD = 0.38).

Materials: Expertise. Participants then indicated their expertise using the same items from study 2. These items were strongly correlated [$r(194) = 0.90$, $p < .001$] and, therefore, averaged together ($M = 3.02$, SD = 1.65).

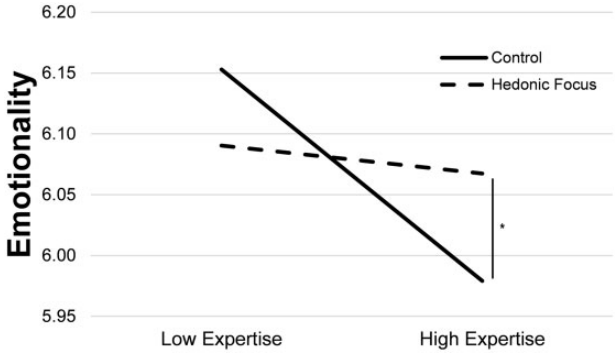
Results

We used mixed-effects modeling to predict emotionality from condition, expertise, and their interaction. The valence of the photographs did not moderate this effect [$\gamma = -0.002$, $t(1{,}749.04) = 0.29$, $p = .77$] and was therefore not included in the subsequent model. As in prior studies, we also controlled for how positive or negative participants were (their extremity).

As in previous studies, more extreme reactions were also more emotional [$\gamma = 1.11$, $t(1{,}919.30) = 31.01$, $p < .001$]. Above this effect, as hypothesized, a significant condition by expertise interaction emerged [$\gamma = 0.02$, $t(189.17) = 2.36$, $p = .019$; see figure 4]. Breaking down this interaction, in the control condition, we replicated the effect from study 2: participants with greater expertise were significantly less emotional than those with less expertise [$\gamma = -0.05$, $t(188.91) = 4.34$, $p < .001$]. However, this difference was significantly reduced in the Hedonic Focus condition. In fact, the slope of expertise was not significant,

FIGURE 4

EFFECT OF HEDONIC FOCUS ON CONSUMERS WITH HIGH VERSUS LOW EXPERTISE (±1 SD), STUDY 5



NOTE.—*$p < .05$.

which indicated that participants with expertise showed equal emotionality compared to those with low expertise [$\gamma = -0.01$, $t(190.30) = 0.46$, $p = .65$]. Indeed, experts (+1 SD) in the Hedonic Focus condition showed significantly greater emotionality compared to experts in the control condition [$\gamma = 0.05$, $t(189.26) = 2.00$, $p = .047$]. Participants with low expertise (−1 SD) showed no significant difference between conditions [$\gamma = -0.03$, $t(189.00) = 1.37$, $p = .17$], indicating hedonic focus selectively increased experts' emotionality.

Discussion

This experiment replicated the numbness of expertise and demonstrated a theory-driven moderator of this numbness. Specifically, when guided to take a hedonic focus, those with expertise showed increased emotionality and no longer differed from those with low expertise. These results reveal two important points. First, these results are consistent with the idea that, while those with *low* expertise engage with the domain hedonically as a default approach, this is not experts' default. Second, rather than experts being inevitably numb, these results suggest that it is not the acquisition of knowledge that leads to numbness, but the application of that knowledge. Indeed, when expert's attention is redirected toward the hedonic aspects of a stimulus they can regain their feelings.

As reported in the web appendix (study W2), we also conducted an additional experiment ($N = 810$) to both replicate and further inform our findings. In this experiment, we manipulated knowledge (vs. no knowledge) and whether participants used a hedonic focus (vs. analytical processing). First, replicating the current study, this experiment indicated that a hedonic focus can lead to high emotion even when participants possess expert knowledge.

These results provide evidence that experts are not inevitably destined to be emotionally numb.

Second, this experiment also demonstrated the importance of having knowledge as opposed to simply being told to adopt an analytical processing approach. In this experiment, when participants were told to process in an analytical fashion but lacked knowledge, they did not exhibit emotional numbness. This result suggests that it is the combination of both having knowledge *and* using it in an analytical fashion that leads to the emotional numbness observed among experts. We report this experiment in the web appendix due to space considerations.

STUDIES 6 AND 7: TRACING EMOTIONAL TRAJECTORIES IN WINE AND BEER EXPERTISE

In our final studies, we sought additional evidence that emotional numbness occurs in the real world. Although online reviews are used to understand various phenomena across marketing (Berger 2014), they are rarely used to follow individual consumers across time. Yet, these reviews offer the remarkable opportunity to follow individual consumers and trace their emotional trajectories as they gain expertise in a domain. As consumers accrue consumption knowledge via their experiences (Clarkson et al. 2013), consistent with our controlled lab experiments, they may become less emotional in their reviews. Thus, unlike our previous experiments, we aimed to examine the emotional trajectories of the same individuals as they become experts as opposed to differences between experts and novices.

To this end, we traced consumers' emotional trajectories across time for wine (study 6) and beer (study 7). Though these studies utilize different settings, consumption domains, and consumers, they converge in their conclusions. For brevity, we present their methods and results together.

Method

Data. In study 6, we obtained all "tasting notes" from the website CellarTracker.com beginning from its creation in 2003 until 2012—9 years of data (McAuley and Leskovec 2013). As described by CellarTracker, tasting notes are meant for consumers to log "how a wine tasted and smelled and whether it was pleasurable or not enjoyable" to help them track their tasting (CellarTracker 2020). Thus, these tasting notes serve not only as reviews of the wine, but also as a journal for consumers to log and track their experiences. There were 38,447 consumers who wrote 1,619,258 tasting notes that used at least one EL word. Each consumer wrote an average of 42.12 tasting notes (SD = 212.40). The wines on this website range from more common varieties such as Riesling and Cabernet Sauvignon to rarer varieties such as Lumassina and Adakarasi ($N = 805$ varieties). There were a total of 419,108 unique wines.

In study 7, we obtained 16 years of beer reviews from the website BeerAdvocate.com beginning from its creation in 1996 until 2012 (McAuley and Leskovec 2013). There were 33,163 consumers who wrote 1,555,885 reviews that used at least one EL word. Each consumer wrote an average of 46.92 reviews (SD = 179.17). The beers on this website range from German Pilsners to English Barleywines to Russian Imperial Stouts ($N = 104$ styles). There were 65,367 unique beers. Both CellarTracker and BeerAdvocate are free to use and require no membership and, thus, there are few barriers to attracting a diverse set of consumers.

Measurement. In line with prior work and conceptualizations of expertise (Alba and Hutchinson 1987; Clarkson et al. 2013; Packard and Berger 2017), we quantified expertise based on the number of wines (study 6) or beers (study 7) a consumer tasted. Though an imperfect measure of expertise, experience is a direct antecedent of knowledge (Clarkson et al. 2013; Cowley and Janus 2004; Hutchinson and Eisenstein 2008). Each additional wine or beer a consumer tasted and then recorded signals an added unit of experience and expertise. Thus, we ordered the tasting notes or beer reviews each consumer wrote by date and numbered them sequentially. Consumers who tasted 30 wines or beers would have their reviews numbered 1–30. Given that a subset of consumers wrote a large number of reviews (see means and standard deviations reported previously), we log transformed this variable for each study so these users would not overly influence the results (Fazio 1990). However, results are the same without this log transformation.

We used the EL (Rocklage et al. 2018a) to calculate consumers' emotionality (study 6: $M = 4.14$, SD = 1.06; study 7: $M = 4.12$, SD = 0.81) and extremity (study 6: $M = 2.75$, SD = 0.62; study 7: $M = 2.60$, SD = 0.51) for each review the same as study 1. We also measured the length of each review in words (study 6: $M = 42.87$, SD = 36.54; study 7: $M = 124.10$, SD = 67.87) and log transformed it.

We also controlled for other possibilities that could explain our effects. Specifically, we investigated the possibility that as consumers gain expertise they become more nuanced in their assessments (Judd and Krosnick 1989). To that end, we controlled for whether the user expressed an ambivalent/mixed assessment (they used both positive *and* negative words) or univalent reaction (they used *only* positive words or *only* negative words).

In addition, it is possible that experts gravitate toward different, potentially more complex, wines or beers that happen to elicit less emotion (McAuley and Leskovec 2013; see also Clarkson et al. 2013). Thus, we controlled for the normative level of emotion each wine or beer elicits (e.g., the average emotionality expressed across all tasting

notes for a given wine) to examine whether the effects held beyond the emotion the wine or beer elicits on average.

Finally, BeerAdvocate allows consumers to report their birthday and gender. Given consumers record their birthday, this provides the unique benefit of controlling for their age when they wrote each review (i.e., a time-varying covariate: the day they wrote a given review minus their birthday; $M = 29.93$, SD $= 8.77$). There were 8,352 consumers (25% of the total) who provided both their birthday and gender. Thus, for this subset of users, we can assess whether the results hold when controlling for both consumers' age at the time they wrote a review and their gender.

Results and Discussion

To model the development of expertise across time, for both studies 6 and 7, we used an advance in modeling intensive longitudinal data called growth curve modeling (Bolger and Laurenceau 2013). Unlike traditional repeated-measures approaches, growth curve modeling has the benefits of easily handling unequally spaced timepoints as well as disparate numbers of observations between consumers, both of which characterize the development of expertise. Equally important, growth curve modeling accounts for the dependencies in longitudinal data by modeling the idiosyncratic variance associated with each individual consumer. In doing so, it accounts for the sources of variance between consumers and allows for the accurate modeling of within-person emotion trajectories.

As shown in tables 2 and 3, these growth curve models indicate that each additional wine (study 6) or beer (study 7) a consumer tasted led to a decrease in their emotion.[5] These results held beyond how positive or negative consumers were (their extremity), the length of the review, whether they were ambivalent or univalent, and how much emotion each wine or beer normatively elicited. As in the prior studies, these results held for both positive and negative emotion. They also held for consumers' *most* emotional reaction for each tasting. In other words, as consumers gained expertise, they simply did not reach the same emotional heights as they had when they were novices. See the web appendix for the details of evidence against alternative accounts (e.g., herding).

GENERAL DISCUSSION

People often pursue expertise because of the pleasure it brings (Maciel and Wallendorf 2017; Ryan and Deci 2000). Yet, across seven studies—four experiments and three field studies—we found consistent evidence that expertise leads to emotional numbness. These results occurred across multiple domains, from movies to photography to wine and beer, and using multiple measures of expertise and emotion. Moreover, we showed this numbness can be explained by the cognitive structure (i.e., knowledge) experts develop and then apply to dissect the product into its constituent parts. We also demonstrate boundary conditions that follow from the importance of the application of knowledge. Emotional numbness is not an inescapable cost of acquiring information. Rather, it comes from using that information to guide one's evaluation or experience. If experts focus on the hedonic aspects of their consumption experience, our results reveal they can largely regain their feeling.

These findings offer several contributions. First, they contribute to research on expertise. The literature has largely focused on the benefits of accruing cognitive structure within a domain. Relatively little work investigates the drawbacks of possessing and applying cognitive structure. Moreover, no work has investigated the negative consequences within a hedonic domain. Our research shows that cognitive structure and the analytical approach it facilitates may take a toll on the feelings the product elicits.

This work also contributes to the literature on emotion and hedonic consumption. Despite the importance of hedonic consumption to both consumers and marketers, we possess surprisingly little systematic knowledge for what contributes to the intensity of feelings consumers have while using a product (Alba and Williams 2013; Pham and Sun 2020). Only recently have we learned how consumers' enjoyment can be undermined by quantifying activities (e.g., measuring walking distance; Etkin 2016), taking photographs with the intention to share them later (Barasch, Zauberman, and Diehl 2018), and scheduling a leisure activity as opposed to an impromptu occurrence (Tonietto and Malkoc 2016). Adding to this literature, we show that expertise can also lead to decreased emotional intensity due to the cognitive structure consumers develop and then apply to the product. We also show that although this is a default tendency for experts, this default can be overcome when experts are guided to focus on the feelings the product may be able to elicit.

These findings also have implications for research on hedonic adaptation and, by extension, satiation (Galak and Redden 2018; Redden 2008). Specifically, work on hedonic adaptation—that is, the "reduction in the affective intensity of favorable and unfavorable circumstances" (Frederick and Loewenstein 1999)—has shown that people tend to exhibit natural declines in their hedonic reactions within a domain over time. This adaptation has been shown to be influenced by multiple processes (e.g., boredom, social comparison). We show a novel pathway through which this decline can occur via the application of consumers' knowledge within a hedonic domain.

Finally, this work has implications for the role of expertise in consumers' word of mouth communications.

5 We also replicate these effects using novices' film reviews in study 1: for each additional film novice consumers watched, they showed a decrease in their emotion [$\gamma = -0.05$, $t(576{,}576.86) = 32.58$, $p < .001$].

TABLE 2

EFFECT OF WINE EXPERTISE ON EMOTIONALITY, STUDY 6

	Primary model (1)	With controls (2)	Predicting peak emotionality (3)
Primary predictor			
Expertise	−0.014*** (0.001)	−0.011*** (0.001)	−0.011*** (0.002)
Positive emotion only	−0.016*** (0.002)	−0.009*** (0.001)	−0.009*** (0.002)
Negative emotion only	−0.020*** (0.002)	−0.019*** (0.004)	−0.022*** (0.004)
Control variables			
Tasting note extremity	0.906*** (0.001)	0.723*** (0.001)	0.945*** (0.001)
Tasting note length		0.007*** (0.002)	0.470*** (0.003)
Ambivalence		0.009*** (0.002)	0.377*** (0.002)
Normative wine emotion		0.736*** (0.001)	0.703*** (0.001)

NOTES.—***$p \leq .001$; ambivalence: 0 = univalent tasting note, 1 = ambivalent tasting note; all other predictor variables are unstandardized. Tasting note extremity is the weighted average extremity for each review except for in model 3 where we control for the most extreme word in order to match the most emotional word. Standard errors are in parentheses.

TABLE 3

EFFECT OF BEER EXPERTISE ON EMOTIONALITY, STUDY 7

	Primary model (1)	With controls (2)	With demographics (3)	Predicting peak emotionality (4)
Primary predictor				
Expertise	−0.012*** (0.001)	−0.015*** (0.001)	−0.016*** (0.001)	−0.017*** (0.001)
Positive emotion only	−0.014*** (0.001)	−0.017*** (0.001)	−0.020*** (0.001)	−0.021*** (0.001)
Negative emotion only	−0.009*** (0.001)	−0.008*** (0.001)	−0.007*** (0.002)	−0.007*** (0.001)
Control variables				
Review extremity	0.842*** (0.001)	0.803*** (0.001)	0.807*** (0.002)	1.066*** (0.002)
Review length		−0.011*** (0.002)	−0.002 (0.003)	0.351*** (0.002)
Ambivalence		0.145*** (0.001)	0.147*** (0.002)	0.471*** (0.002)
Consumer's age			0.002*** (0.001)	
Consumer's gender			0.087*** (0.017)	
Normative beer emotion		0.586*** (0.001)	0.567*** (0.004)	0.720*** (0.004)

NOTES.—***$p \leq .001$; ambivalence: 0 = univalent review, 1 = ambivalent review; gender: 0 = male, 1 = female; all other predictor variables are unstandardized. Model 3 uses a subset of 8,352 consumers who provided their birthday and gender. Review extremity is the weighted average extremity for each review except for in model 4 where we control for the most extreme word to match the most emotional word. Standard errors are in parentheses.

Research indicates that consumers who express low emotion toward hedonic products are considered less impactful compared to those expressing more emotional reactions (Rocklage and Fazio 2020). Readers expect emotional reactions toward hedonic products and give less credence to reviews that do not fit these expectations. Ironically, then, given the current work shows that experts experience and then express low emotion, one implication is that they may sometimes be less impactful in their reviews (Packard and Berger 2017). As a solution, experts may want to increase the emotion of their reactions, or, given people trust experts more than non-experts (Gilly et al. 1998; Petty and Wegener 1998), they may want to specifically signal they have expertise in the domain to offset their low emotion (Rocklage and Fazio 2020).

Limitations and Future Directions

Some might view the current work as revealing a somewhat bleak depiction of hedonic outcomes for experts. Are experts doomed to numbness? As we show, numbness is not inevitable. We find that when participants did not apply their learning or when they were guided to use a hedonic focus, they did not experience less intense emotion. Put differently, mere knowledge within a domain does not bind consumers to emotional numbness. We show one pathway for avoiding this numbness—focusing on the hedonic aspects of the product—but research also hints at other pathways. For example, research has shown that consumers can become more engaged when consuming products in novel and unique ways (O'Brien and Smith 2019) or by taking a novel perspective on the consumption experience (Redden 2008). Such approaches might also shift experts away from applying their cognitive structure and more toward their feelings. These additional approaches have not been tested with experts, but they provide avenues for future research. Thus, Stanley Kubrick film buffs who decide to set aside their expertise for an evening might find themselves experiencing a stronger emotional response.

Another question is, if consumers become relatively numb in their hedonic consumption, why do they continue

their journey toward expertise? As indicated in prior work, expertise provides numerous benefits—from a sense of mastery to social prestige (Maciel and Wallendorf 2017; Ryan and Deci 2000). Thus, their continued consumption might stem from a reward from these experiences. Indeed, the current work explicitly focuses on the *feelings* consumers have during product consumption, but experts are likely to extract meaning in other ways (e.g., the concept of eudaimonia; Ryan and Deci 2001). For example, an analytical approach and the very acts of thinking, judging, and evaluating are pursuits in-and-of-themselves for many consumers (Cacioppo and Petty 1982; Jarvis and Petty 1996). Continuing recent work (Maciel and Wallendorf 2017), future research has the opportunity to investigate the extent to which analysis and mastery become self-reinforcing motivators for continued engagement within hedonic domains, even in the absence of emotion.

Relatedly, we have provided evidence that experts apply their knowledge as a default approach, which then leads to emotional numbness. Yet, if experts have the ability to feel as we have also shown, why might they still apply their knowledge as a default? As one possibility, it seems likely that experts have repeatedly practiced applying their knowledge within the domain. Thus, when they encounter a related object, experts' relevant knowledge is likely to come to mind and then used to engage with that object unless motivated to do otherwise. This may all occur with relatively little consideration of the emotionality tradeoff we have shown here. Future research has the ability to investigate the conditions under which experts are aware of this tradeoff and when they might alter their approach in response to it.

Future research could also seek to identify additional consequences of experts' reduced feeling. For instance, prior work has shown that empathy and emotion are important for spurring consumers to behavior (Shiv and Fedorikhin 1999; Small and Cryder 2016). As one example of this, research has shown that eliciting emotional reactions toward advertisements for charitable causes can lead to larger donations to those causes (Small et al. 2007). These effects are attenuated when consumers are primed to take a deliberative mindset. Though this prior work did not focus on expertise, it seems possible that giving people knowledge about how to analyze and dissect advertising may lead to decreased emotion, which could lead to decreased donation behavior. This, in turn, would be another means through which the numbing effect of expertise has further downstream consequences for consumer behavior.

In line with a wide range of findings across both marketing and psychology, we have conceptualized the development of expertise as the process of building domain-specific cognitive structure, which then facilitates the ability to decompose and analyze an item (Alba and Hutchinson 1987; Maciel and Wallendorf 2017; Mellers et al. 2015). Nevertheless, recent research has put forth the possibility that the very final stage of expertise—master sommeliers, for example—may be marked by a more holistic processing approach (LaTour and Deighton 2019). That is, the highest level of hedonic expertise may include the automation of some aspects of the analytical stage, which can allow high-level experts to consider the item in a more "gestalt" fashion. As such, it is possible that although our findings capture the majority of consumers who develop knowledge in a domain—there are only 269 master sommeliers in the world (The Court of Master Sommeliers 2020)—we are capturing one aspect of expertise development, but not all. The implications of using this more gestalt approach for emotion are thus an interesting question for future research.

Anecdotal evidence suggests that as consumers gain expertise, they may become more negative in their attitudes. Indeed, there is the common stereotype of the expert who is negative toward a wide range of products (Alba and Williams 2013). Though we focus on consumers' emotion, the current work can inform future research on the positivity of attitudes experts form. Across our seven studies (and two additional in the web appendix), the evidence is extremely mixed for how expertise affects the positivity of consumers' attitudes. In some studies, experts do indeed show significantly greater negativity (studies 1 and 7). Yet, other studies show no significant difference (studies 2 and 5 and study W1 in the web appendix) and still others show experts become significantly more *positive* (studies 3, 4, and 6 and study W2 in the web appendix; see web appendix for all analyses). Moreover, we find that these results cannot be explained by experts simply becoming more mixed in their evaluations over time (i.e., they often occur above-and-beyond ambivalence). Thus, while experts' hedonic experience may deteriorate, they appear to begin to base their attitudes on different types of information (Zanna and Rempel 1988). Given this disjunction between emotion and valence, future research has the opportunity to more systematically investigate when and why expert knowledge affects the valence of consumers' attitudes toward hedonic products.

Conclusion

As stated at the outset of this work, consumers crave expertise. Ironically, then, in their thirst for expertise, people may deprive themselves of the very feelings that consumption can bring. The present research serves as an open invitation for additional work to understand the more emotional side of acquiring and applying expertise and to better understand how consumers' expertise shapes their consumption experience.

DATA COLLECTION INFORMATION

The first author collected the data for study 1 in 2017 from Rotten Tomatoes, studies 2–5 and studies W1 and W2 in the web appendix using Mechanical Turk from 2017 to 2020, and studies 6 and 7 from existing databases from 2013 (McAuley and Leskovec 2013). The first author analyzed the data with input from the other authors. The data are currently stored in a project directory on the Open Science Framework.

REFERENCES

Alba, Joseph W. and Elanor F. Williams (2013), "Pleasure Principles: A Review of Research on Hedonic Consumption," *Journal of Consumer Psychology*, 23 (1), 2–18.

Alba, Joseph W. and J. Wesley Hutchinson (1987), "Dimensions of Consumer Expertise," *Journal of Consumer Research*, 13 (4), 411–54.

—— (2000), "Knowledge Calibration: What Consumers Know and What They Think They Know," *Journal of Consumer Research*, 27 (2), 123–56.

Alloy, Lauren B. and Naomi Tabachnik (1984), "Assessment of Covariation by Humans and Animals: The Joint Influence of Prior Expectations and Current Situational Information," *Psychological Review*, 91 (1), 112–49.

Baayen, R. H., D. J. Davidson, and D. M. Bates (2008), "Mixed-Effects Modeling with Crossed Random Effects for Subjects and Items," *Journal of Memory and Language*, 59 (4), 390–412.

Barasch, Alixandra, Gal Zauberman, and Kristin Diehl (2018), "How the Intention to Share Can Undermine Enjoyment: Photo-Taking Goals and Evaluation of Experiences," *Journal of Consumer Research*, (G. Johar and R. Hamilton, eds.), 44 (6), 1220–37.

Bauer, Daniel J., Kristopher J. Preacher, and Karen M. Gil (2006), "Conceptualizing and Testing Random Indirect Effects and Moderated Mediation in Multilevel Models: New Procedures and Recommendations," *Psychological Methods*, 11 (2), 142–63.

Berger, Jonah (2014), "Word of Mouth and Interpersonal Communication: A Review and Directions for Future Research," *Journal of Consumer Psychology*, 24 (4), 586–607.

Bolger, Niall and Jean-Philippe Laurenceau (2013), *Intensive Longitudinal Methods: An Introduction to Diary and Experience Sampling Research*, New York, NY: The Guilford Press.

Bradley, Margaret M., and Peter J. Lang (1994), "Measuring Emotion: The Self-Assessment Manikin and the Semantic Differential," *Journal of Behavior Therapy and Experimental Psychiatry*, 25 (1), 49–59.

Cacioppo, John T., and Richard E. Petty (1982), "The Need for Cognition," *Journal of Personality and Social Psychology*, 42 (1), 116–31.

Carlson, Jay P., Leslie H. Vincent, David M. Hardesty, and William O. Bearden (2009), "Objective and Subjective Knowledge Relationships: A Quantitative Analysis of Consumer Research Findings," *Journal of Consumer Research*, 35 (5), 864–76.

CellarTracker (2020), "Tasting Notes," [available at https://www.cellartracker.com/helptip.asp?Topic=tastingnote].

Chase, William G., and Herbert A. Simon (1973), "Perception in Chess," *Cognitive Psychology*, 4 (1), 55–81.

Clarkson, Joshua J., Chris Janiszewski, and Melissa D. Cinelli (2013), "The Desire for Consumption Knowledge," *Journal of Consumer Research*, 39 (6), 1313–29.

Court of Master Sommeliers (2016), "Deductive Tasting Grid."

Cowley, Elizabeth, and Eunika Janus (2004), "Not Necessarily Better, but Certainly Different: A Limit to the Advertising Misinformation Effect on Memory," *Journal of Consumer Research*, 31 (1), 229–35.

Dillon, William R., Thomas J. Madden, Amna Kirmani, and Soumen Mukherjee (2001), "Understanding What's in a Brand Rating: A Model for Assessing Brand and Attribute Effects and Their Relationship to Brand Equity," *Journal of Marketing Research*, 38 (4), 415–29.

Dodds, Peter Sheridan, and Christopher M. Danforth (2010), "Measuring the Happiness of Large-Scale Written Expression: Songs, Blogs, and Presidents," *Journal of Happiness Studies*, 11 (4), 441–56.

Etkin, Jordan (2016), "The Hidden Cost of Personal Quantification," *Journal of Consumer Research*, 42 (6), 967–84.

Fazio, Russell H. (1990), "A Practical Guide to the Use of Response Latency in Social Psychological Research," in *Research Methods in Personality and Social Psychology*, C. Hendrick and M. S. Clark, eds., Newbury Park: Sage Publications, 74–97.

Fraenkel, Jack, Wallen Norman, and Helen Hyun (2018), *How to Design and Evaluate Research in Education*, New York, NY: McGraw-Hill Education.

Frederick, Shane and George Loewenstein (1999), "Hedonic Adaptation," in *Well-Being: The Foundations of Hedonic Psychology*, D. Kahneman, E. Diener, and N. Schwarz, eds., New York, NY: Russell Sage Foundation, 302–29.

Gaiter, Dorothy J., and Brecher John (2006), "Learning the Ropes about Vines: How a Class Can Enhance Your Wine Experience; History and Screw Tops," *Wall Street Journal*,

Galak, Jeff, and Joseph P. Redden (2018), "The Properties and Antecedents of Hedonic Decline," *Annual Review of Psychology*, 69 (1), 1–25.

Gernsheim, Helmut (1984), *Incunabula of British Photographic Literature: A Bibliography of British Photographic Literature, 1839–75, and British Books Illustrated with Origin*, London: Scolar Press.

Gilly, M. C., J. L. Graham, M. F. Wolfinbarger, and L. J. Yale (1998), "A Dyadic Study of Interpersonal Information Search," *Journal of the Academy of Marketing Science*, 26 (2), 83–100.

Hamaker, Ellen L., and Bengt Muthén (2020), "The Fixed versus Random Effects Debate and How It Relates to Centering in Multilevel Modeling," *Psychological Methods*, 25 (3), 365–79.

Hirschman, Elizabeth C. and Morris B. Holbrook (1982), "Hedonic Consumption: Emerging Concepts, Methods and Propositions," *Journal of Marketing*, 46 (3), 92–101.

Hutchinson, J. Wesley and Joseph W. Alba (1991), "Ignoring Irrelevant Information: Situational Determinants of Consumer Learning," *Journal of Consumer Research*, 18 (3), 325–45.

Hutchinson, J. Wesley and Eric M. Eisenstein (2008), "Consumer Learning and Expertise," in *Handbook of Consumer Psychology*, New York, NY: Taylor & Francis, 103–32.

Jarvis, W. Blair G. and Richard E. Petty (1996), "The Need to Evaluate," *Journal of Personality and Social Psychology*, 70 (1), 172–94.

Johnson, Kathy E. and Carolyn B. Mervis (1997), "Effects of Varying Levels of Expertise on the Basic Level of Categorization," *Journal of Experimental Psychology: General*, 126 (3), 248–77.

Judd, Charles M. and Jon A. Krosnick (1989), "The Structural Bases of Consistency among Political Attitudes: Effects of Political Expertise and Attitude Importance," in *Attitude Structure and Function*, eds. A. R. Pratkanis, S. J. Breckler, and A. G. Greenwald, Hilldale, NJ: Lawrence Erlbaum, 99–129.

Kteily, Nour S., Matthew D. Rocklage, Kaylene McClanahan, and Arnold K. Ho (2019), "Political Ideology Shapes the Amplification of the Accomplishments of Disadvantaged vs. advantaged Group Members," *Proceedings of the National Academy of Sciences of the United States of America*, 116 (5), 1559–68.

Kurdi, Benedek, Shayn Lozano and Mahzarin R. Banaji (2017), "Introducing the Open Affective Standardized Image Set (OASIS)," *Behavior Research Methods*, 49 (2), 457–70.

Langewiesche, William (2000), "The Million-Dollar Nose," *The Atlantic*, https://www.theatlantic.com/magazine/archive/2000/12/the-million-dollar-nose/378450/.

LaTour, Kathryn A. and John Deighton (2019), "Learning to Become a Taste Expert," *Journal of Consumer Research*, 46 (1), 1–19.

LaTour, Kathryn A. and Michael S. LaTour (2010), "Bridging Aficionados' Perceptual and Conceptual Knowledge to Enhance How They Learn from Experience," *Journal of Consumer Research*, 37 (4), 688–97.

Lichtenstein, Sarah, Fischhoff Baruch and Lawrence D. Phillips (1982), "Calibration of Probabilities: The State of the Art to 1980," in *Judgment under Uncertainty: Heuristics and Biases*, eds. D. Kahneman, P. Slovic, and A. Tversky, New York: Cambridge University Press, 306–34.

Maciel, Andre F., and Melanie Wallendorf (2017), "Taste Engineering: An Extended Consumer Model of Cultural Competence Constitution," *Journal of Consumer Research*, 43 (5), 726–46.

MacKinnon, David P., Chondra M. Lockwood and Jason Williams (2004), "Confidence Limits for the Indirect Effect: Distribution of the Product and Resampling Methods," *Multivariate Behavioral Research*, 39 (1), 99–128.

McAuley, Julian John and Jure Leskovec (2013), "From Amateurs to Connoisseurs: Modeling the Evolution of User Expertise Through Online Reviews," in *Proceedings of the 22Nd International Conference on World Wide Web, WWW '13*, New York, NY, USA: ACM, 897–908.

McCoy, Elin (2006), *The Emperor of Wine: The Rise of Robert M. Parker, Jr., and the Reign of American Taste*, New York: Ecco.

Mellers, Barbara, Eric Stone, Terry Murray, Angela Minster, Nick Rohrbaugh, Michael Bishop, Eva Chen, Joshua Baker, Yuan Hou, Michael Horowitz, Lyle Ungar and Philip Tetlock (2015), "Identifying and Cultivating Superforecasters as a Method of Improving Probabilistic Predictions," *Perspectives on Psychological Science*, 10 (3), 267–81.

Mischel, Walter and Yuichi Shoda (1995), "A Cognitive-Affective System Theory of Personality: Reconceptualizing Situations, Dispositions, Dynamics, and Invariance in Personality Structure," *Psychological Review*, 102 (2), 246–68.

Mitchell, Andrew A. and Peter A. Dacin (1996), "The Assessment of Alternative Measures of Consumer Expertise," *Journal of Consumer Research*, 23 (3), 219–39.

Nezlek, John B. (2011), *Multilevel Modeling for Social and Personality Psychology*, Thousand Oaks, CA: SAGE Publications.

Nguyen, Peter, Xin (Shane) Wang, Xi Li and June Cotte (2021), "Reviewing Experts' Restraint from Extremes and Its Impact on Service Providers," *Journal of Consumer Research,* 47 (5), 654–74.

Noble, A. C, R. A. Arnold, J. Buechsenstein, E. J. Leach, J. O. Schmidt and P. M. Stern (1987), "Modification of a Standardized System of Wine Aroma Terminology," *American Journal of Enology and Viticulture*, 38 (2), 143–6.

Novak, Thomas P. and Donna L. Hoffman (2009), "The Fit of Thinking Style and Situation: New Measures of Situation-Specific Experiential and Rational Cognition," *Journal of Consumer Research*, 36 (1), 56–72.

O'Brien, Ed and Robert W. Smith (2019), "Unconventional Consumption Methods and Enjoying Things Consumed: Recapturing the 'First-Time' Experience," *Personality & Social Psychology Bulletin*, 45 (1), 67–80.

Packard, Grant and Jonah Berger (2017), "How Language Shapes Word of Mouth's Impact," *Journal of Marketing Research*, 54 (4), 572–88.

Parker, Robert (2020), "TWA Rating System—Robert Parker Wine Advocate," https://www.robertparker.com/ratings.

Pennebaker, James W., Ryan L. Boyd, Kayla Jordan, and Kate Blackburn (2015), "The Development and Psychometric Properties of LIWC2015," Retrieved from https://repositories.lib.utexas.edu/handle/2152/31333.

Petty, Richard E. and Duane T. Wegener (1998), "Attitude Change: Multiple Roles for Persuasion Variables," in *The Handbook of Social Psychology*, eds. D. T. Gilbert, S. T. Fiske, and G. Lindzey, New York, NY, US: McGraw-Hill, 323–90.

Pham, Michel Tuan and Jennifer J. Sun (2020), "On the Experience and Engineering of Consumer Pride, Consumer Excitement, and Consumer Relaxation in the Marketplace," *Journal of Retailing*, 96 (1), 101–27.

Reagan, Andrew J., Christopher M. Danforth, Brian Tivnan, Jake Ryland Williams, and Peter Sheridan Dodds (2017), "Sentiment Analysis Methods for Understanding Large-Scale Texts: A Case for Using Continuum-Scored Words and Word Shift Graphs," *EPJ Data Science*, 6 (1), 28.

Redden, Joseph P. (2008), "Reducing Satiation: The Role of Categorization Level," *Journal of Consumer Research*, 34 (5), 624–34.

Rocklage, Matthew D. and Russell H. Fazio (2015), "The Evaluative Lexicon: Adjective Use as a Means of Assessing and Distinguishing Attitude Valence, Extremity, and Emotionality," *Journal of Experimental Social Psychology*, 56, 214–27.

—— (2016), "On the Dominance of Attitude Emotionality," *Personality & Social Psychology Bulletin*, 42 (2), 259–70.

—— (2018), "Attitude Accessibility as a Function of Emotionality," *Personality & Social Psychology Bulletin*, 44 (4), 508–20.

—— (2020), "The Enhancing versus Backfiring Effects of Positive Emotion in Consumer Reviews," *Journal of Marketing Research*, 57 (2), 332–52.

Rocklage, Matthew D., Derek D. Rucker, and Loran F. Nordgren (2018a), "The Evaluative Lexicon 2.0: The Measurement of Emotionality, Extremity, and Valence in Language," *Behavior Research Methods*, 50 (4), 1327–44.

—— (2018b), "Persuasion, Emotion, and Language: The Intent to Persuade Transforms Language via Emotionality," *Psychological Science*, 29 (5), 749–60.

Rotten Tomatoes (2020), "Tomatometer Criteria," https://www.rottentomatoes.com/help_desk/critics.

Ryan, Richard M. and Edward L. Deci (2000), "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being," *American Psychologist*, 55 (1), 68–78.

—— (2001), "On Happiness and Human Potentials: A Review of Research on Hedonic and Eudaimonic Well-Being," *Annual Review of Psychology*, 52 (1), 141–66.

Sethna, Edward (1992), "Analysis of Judging," *Royal Photographic Society Journal*, 132, 424–6.

Shanteau, James (1992), "Competence in Experts: The Role of Task Characteristics," *Organizational Behavior and Human Decision Processes*, 53 (2), 252–66.

Shanteau, James and Thomas R. Stewart (1992), "Why Study Expert Decision Making? Some Historical Perspectives and Comments," *Organizational Behavior and Human Decision Processes*, 53 (2), 95–106.

Shiv, Baba and Alexander Fedorikhin (1999), "Heart and Mind in Conflict: The Interplay of Affect and Cognition in Consumer Decision Making," *Journal of Consumer Research*, 26 (3), 278–92.

Small, Deborah A. and Cynthia Cryder (2016), "Prosocial Consumer Behavior," *Current Opinion in Psychology*, 10, 107–11.

Small, Deborah A., George Loewenstein, and Paul Slovic (2007), "Sympathy and Callousness: The Impact of Deliberative Thought on Donations to Identifiable and Statistical Victims," *Organizational Behavior and Human Decision Processes*, 102 (2), 143–53.

Spence, Mark T. and Merrie Brucks (1997), "The Moderating Effects of Problem Characteristics on Experts' and Novices' Judgments," *Journal of Marketing Research*, 34 (2), 233–47.

Spencer, Steven J., Mark P. Zanna, and Geoffrey T. Fong (2005), "Establishing a Causal Chain: Why Experiments Are Often More Effective than Mediational Analyses in Examining Psychological Processes," *Journal of Personality and Social Psychology*, 89 (6), 845–51.

The Court of Master Sommeliers (2020), "How Many Master Sommeliers Are There?," https://www.mastersommeliers.org/about.

Tonietto, Gabriela N. and Selin A. Malkoc (2016), "The Calendar Mindset: Scheduling Takes the Fun out and Puts the Work In," *Journal of Marketing Research*, 53 (6), 922–36.

Voght, Kara (2017), "Chicago Sommeliers Enjoy the Taste of Growing Popularity," in *Medill Reports Chicago*.

West, Patricia M., Christina L. Brown, and Stephen J. Hoch (1996), "Consumption Vocabulary and Preference Formation," *Journal of Consumer Research*, 23 (2), 120–35.

Westfall, Jacob, David A. Kenny, and Charles M. Judd (2014), "Statistical Power and Optimal Design in Experiments in Which Samples of Participants Respond to Samples of Stimuli," *Journal of Experimental Psychology. General*, 143 (5), 2020–45.

Wood, Stacy L. and John G. Lynch (2002), "Prior Knowledge and Complacency in New Product Learning," *Journal of Consumer Research*, 29 (3), 416–26.

Zanna, Mark P. and John K. Rempel (1988), "Attitudes: A New Look at an Old Concept," in *The Social Psychology of Knowledge*, eds. D. Bar-Tal and A. W. Kruglanski, Cambridge, England: Cambridge University Press, 315–34.