

Expression Modalities: How Speaking Versus Writing Shapes Word of Mouth

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Consumers often communicate their attitudes and opinions with others, and such word of mouth has an important impact on what others think, buy, and do. But might the way consumers communicate their attitudes (i.e., through speaking or writing) shape the attitudes they express? And, as a result, the impact of what they share? While a great deal of research has begun to examine drivers of word of mouth, there has been less attention to how communication modality might shape sharing. Six studies, conducted in the laboratory and field, demonstrate that compared to speaking, writing leads consumers to express less emotional attitudes. The effect is driven by deliberation. Writing offers more time to deliberate about what to say, which reduces emotionality. The studies also demonstrate a downstream consequence of this effect: by shaping the attitudes expressed, the modality consumers communicate through can influence the impact of their communication. This work sheds light on word of mouth, effects of communication modality, and the role of language in communication.

Keywords: word of mouth, communication modality, emotion, speaking, writing, automated text analysis

Consumers often share attitudes and opinions with others. They talk about movies they like, restaurants they hate, and books they can't wait to read. Indeed, Americans have over 2.4 billion brand-related conversations per day (Keller and Fay 2012), and such word of

mouth has a huge impact on consumer behavior (Chevalier and Mayzlin 2006; Herr, Kardes, and Kim 1991; for a review, see Moore and Lafreniere 2020). Consequently, more and more organizations are shifting resources from traditional advertising to driving word of mouth (Berger 2013).

But while it is clear that word of mouth is both frequent, and important, less is known about whether the way consumers communicate their attitudes might shape what they share. Word of mouth usually occurs through speaking or writing (Chafe and Tannen 1987). Consumers speak face-to-face, on the phone, and through video chat. They write emails, texts, social media posts, and even letters. Moreover, though many product reviews are written, spoken reviews are becoming increasingly common, potentially driving over \$24 billion in electronics sales alone (Wolk 2021). But despite their ubiquity, whether and how these modalities might shape attitude expression is less clear. Might the modality through which consumers communicate shape the attitudes they express?

Emotion is a fundamental way consumers form and express their opinions (Abelson et al. 1982; Zanna and

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Rempel 1988). Indeed, emotion is a primary basis of attitudes (Smith 1947) that shape word of mouth and consumer behavior (Berger 2011; Berger and Milkman 2012; Lavine et al. 1998; Rocklage and Luttrell 2021). Might speaking versus writing influence whether consumers express more or less emotional attitudes, and thus the impact of their communication? Could writing rather than speaking about a movie, for example, lead consumers to express less emotional attitudes? And, as a result, shift others' interest in seeing it?

A multimethod investigation, including six studies conducted in the lab and field, tests these possibilities. They examine whether different communication modalities lead consumers to express more or less emotional attitudes and document an underlying process that contributes to this phenomenon. Further, they illustrate the downstream consequences of communication mode on how likely others are to follow what someone says.

This work makes three main contributions. First, despite word of mouth's importance to both consumers and marketers, little is known about whether expressing one's opinions through speaking versus writing might change what is conveyed. Given word of mouth's impact on consumer behavior and sales, and the fact that speaking and writing are the primary ways information and opinions are expressed, this deserves greater attention.

Second, this article deepens understanding around language and consumer behavior. While language shapes almost everything consumers do, until recently, it has been relatively understudied. We contribute to the growing literature on consumer language (Berger et al., 2020; Berger and Packard 2021; Moore and McFerran 2017; Packard, Moore, and McFerran 2018; Packard and Berger 2017, 2021), showing that *how* consumers communicate impacts the language they use.

Third, modality's effects have important substantive implications for various stakeholders. Compared to writing, for example, speaking can encourage emotional expression, which could change how communicators are perceived and the consequences of conversation. E-commerce websites could benefit from enabling video product reviews. Letting consumers speak rather than write about their opinions could boost their emotional content, which can enhance persuasion. Customer service surveys could invite consumers to share their feedback via video or audio recording rather than text, exposing firms more to emotional aspects of the customer experience.

That said, if the goal is to reduce emotion, writing may help. Doctors, for example, may want to write down thoughts before communicating with patients, and customer service interactions may be more productive when they occur through writing (than speaking). Similarly, market research firms might consider whether to solicit opinions orally or in writing as this decision may shape the insights gained.

WORD OF MOUTH

A growing literature has explored the causes and consequences of word of mouth, or consumers expressing their attitudes and opinions to others (for reviews, see Berger 2014; Chen and Yuan 2020). Consumers share to self-enhance (Packard and Wooten 2013), and connect with others (Chen 2017), for example, and such interpersonal communication shapes others' attitudes (Herr et al. 1991) and purchases (Chevalier and Mayzlin 2006).

But while research has provided important insights into word of mouth, there has been less attention to whether *how* consumers communicate (i.e., the modality or device used) might impact communication. Some research has begun to look at how smartphones shape sharing. Compared to desktop computers, for example, smartphones' physically constrained nature encourages consumers to focus on the gist of their experiences (Melumad, Inman, and Pham 2019). Other work finds that compared to desktop computers, content created on mobile tends to be more concrete (Ransbotham, Lurie, and Liu 2019) and can boost purchase because it seems more effortful to produce (Grewal and Stephen 2019).

Beyond specific devices though, an even more fundamental difference is whether communication is spoken or written (Chafe 1982; Chafe and Danielewicz 1987; Shen and Sengupta 2018). Face-to-face communication, phone calls, and video chats involve spoken or oral communication, while email, texting, and social media usually involve writing.¹ While this difference might seem minor, might modality shape attitude expression, and if so, how?

ATTITUDE EMOTIONALITY

Emotion is a primary way attitudes are formed and expressed (Abelson et al. 1982; Zanna and Rempel 1988). Indeed, attitude emotionality—the extent to which an attitude is based on people's emotional, feelings-based reactions (Zanna and Rempel 1988)—has a long legacy in the attitudes literature. Decades of research finds that emotions are given strong weight when people make evaluative judgments (Lavine et al. 1998; Stangor, Sullivan, and Ford 1991) and that attitudes based on emotion are particularly stable across time (Rocklage and Luttrell 2021) and context (Rocklage and Fazio, 2016).

Emotion is also central to communication (Ekman 1982). The social-functional approach suggests that a primary purpose of emotion is to convey information about people's attitudes and internal states (Frijda and Mesquita 1994; van Kleef 2009). People use anger to signal negative

¹ While voice-to-text technologies allow people to write (e.g., an email) through speaking, the content is still produced orally. We discuss these potentially blended methods in more detail in the general discussion.

attitudes (Andrade and Ho 2009), for example, and use emotional language when trying to persuade (Rocklage, Rucker, and Nordgren 2018a).

Expressing emotion, in turn, affects others' attitudes and behavior. Expressing greater emotional warmth at the beginning and end of customer service calls leads agents to be seen as more helpful (Li, Packard, and Berger 2021), for example, and describing products in emotional terms can increase purchase (Rocklage and Fazio, 2020). Similarly, content created by smartphone (rather than desktop) is more emotional and impactful (Melumad et al. 2019)² and swearwords boost purchase because they convey feelings (Lafreniere and Moore 2018).

Attitudes vary, though, in the degree to which they are based on emotion (Abelson et al. 1982; Zanna and Rempel 1988). Someone's attitude toward a restaurant, for example, could be based heavily on how they feel (e.g., they enjoy the food) or could be based less on feelings (e.g., they think the food is reasonably priced and healthy).

Similarly, consumers can express more or less emotional attitudes to others (Rocklage and Fazio 2015). When expressing positive attitudes toward a movie, for example, many words could be used. Someone could say a movie was "amazing" or "excellent." Both are positive, and equally so, but the word "amazing" indicates that the attitude is based more on an emotional, feelings-based reaction (Rocklage and Fazio 2015). Similarly, saying something is "perfect" or "superb" signals very positive, but low emotionality attitudes, while saying something is "delightful" or "fantastic" signals high emotionality. In fact, all these words express a similar degree of positivity (i.e., the same *extremity*), but different levels of feeling (i.e., *emotionality*).

But while it is clear that emotion is an integral part of attitudes, and can have important downstream consequences, might it be influenced by communication modality? And if so, how?

HOW MODALITY SHAPES EMOTIONALITY

Increasing Emotionality Through Substitution

One possibility is that writing leads consumers to express more emotional attitudes. When writing, the main way consumers can express emotion is words (Brady et al. 2017). Consequently, to express more emotional attitudes, they often use more emotional words (Rocklage and Fazio 2015). Rather than saying a restaurant is "excellent," for example, they might use equally positive but more emotionally laden language (i.e., "amazing").

2 While related, note that this work considered a different question (i.e., comparing two written channels rather than writing vs. speaking) and mechanism (i.e., physical constraints and gist rather than deliberation).

When speaking, however, consumers have additional ways to express emotion. Not only can they use emotional words (e.g., "I love that place"), they can use nonverbal aspects or paralinguistics (e.g., pitch or tone) to convey emotion as well. When people are happy, for example, they tend to speak in a higher pitched voice (Laukka et al. 2016).

Consequently, one possibility is substitution. Because pitch, tone, and other nonverbal means to communicate emotion are harder to use when writing (Luangrath et al. 2017), writing may lead consumers to use more emotional language to express their attitudes.

Decreasing Emotionality Through Deliberation

In contrast, we suggest the opposite. Rather than leading consumers to express more emotional attitudes, we suggest that writing should *decrease* emotional expression.

While there are multiple reasons this might occur, we suggest that one key driver is deliberation. Speaking often doesn't involve a great deal of planning (Altenberg 1984; Ochs 1979). Unless someone knows a specific conversation is going to occur, there is little opportunity to plan what to say in advance. Further, once conversation starts, communication is relatively synchronous, with little delay between utterances and responses. Consequently, language is often constructed on the spot. Indeed, when speaking, planning and producing often occur simultaneously (Ferreira and Swets 2002), and speakers don't always know the full meaning of what they are saying before it is said (Linell 1988). Speakers usually start producing language as soon as they have formulated the smallest bit of linguistic structure to describe a thought (e.g., content words like nouns and verbs; Dell 1986; Dell, Burger, and Svec 1997) and then fill in the rest of the information as they go (Jahandarie, 1999).

Writing, however, is more premeditated (Altenberg 1984; Chafe 1985; Jahandarie 1999). Unlike bumping into a friend in person, receiving an email or text from them offers more time to think about what to say in response. Written conversational turns are also more asynchronous (Horowitz and Newman 1964), so there is less of a rush to produce content, allowing for more deliberation. Indeed, while speaking often leads people to talk about whatever is accessible or top of mind (Berger and Schwartz 2011), writing can lead people to talk about more interesting products or brands (Berger and Iyengar 2013) and be more economical and erudite (Sproull and Kiesler 1986) because they have the time to plan.³

3 This difference holds even outside of live conversation. When leaving a voicemail, for example, people tend to speak relatively continuously, without stopping to think about what to say along the way. This can be contrasted with sharing opinions online, where the communication mode allows communicators to pause and deliberate more about

Writing's increased deliberation, in turn, should reduce the emotionality of attitude expression. Researchers have long distinguished between two mental systems or processes (Kahneman and Frederick 2002; Stanovich and West 2000). One is relatively quick, automatic, and intuitive ("system 1"), and the other is more analytical and effortful ("system 2"). The automatic system or process tends to be more affective in nature, and people rely more on their emotions when making quick judgments (Rocklage and Fazio 2016).

Speaking's unplanned nature should privilege emotion. What speakers talk about is shaped by accessibility (Berger and Schwartz 2011), emotional words and reactions tend to come to mind first (Mueller and Kuchinke 2016; Rocklage and Fazio, 2018), and feelings are said to be more primary than thoughts (Zajonc 1980). Indeed, speaking is associated with greater activation of affective/rostral areas of the anterior cingulate cortex (Paus et al. 1993), which may lead emotional responses to drive behavior (Klesse, Levav, and Goukens 2015).

Writing is more deliberative (Horowitz and Newman 1964; Rapp et al. 2015), however, which should lead consumers to express less emotional attitudes. Affect plays less of a role when processing resources are available (Shiv and Fedorikhin 1999), and encouraging people to think more deliberately reduces affect (Rocklage, Rucker, and Nordgren 2021) and its impact (Hsee and Rottenstreich 2004; Small, Loewenstein, and Slovic 2007).

Consequently, the deliberation that writing often involves should lead consumers to express less emotional attitudes. Just as affect has less of an effect on decision-making when people think more deliberately (Hsee and Rottenstreich 2004; Small et al. 2007), writing, which is more planned (Ochs 1979) and involves more thinking about what to say (i.e., deliberation), should reduce emotionality. Rather than relying on what happens to naturally be more accessible (i.e., emotion), having more time to express oneself should encourage deliberation and thus lead consumers to express less emotional attitudes.

Work on traumatic experiences is consistent with this notion. Writing can help people deal with trauma (Pennebaker and Chung 2007). Writing (vs. not writing) about the death of a loved one, for example, can reduce physician visits, decrease heart rate, and improve immune system functioning (for a review, see Baikie and Wilhelm 2005). One reason is that writing about, and thus deliberating on, such negative events can help individuals organize their thoughts and move beyond their initial emotional reactions (Niederhoffer and Pennebaker 2009; Park, Ayduk, and Kross 2016). These findings are consistent with the notion that writing, and the deliberation it involves, can reduce emotionality.

what to write (both before they start communicating and at any point during content creation).

THE CURRENT RESEARCH

Taken together, we suggest that writing may lead consumers to express less emotional attitudes. Further, modal differences in deliberation should contribute to this effect.

A multimethod approach tests these possibilities in the laboratory and in the field. Study 1 provides a preliminary test, examining whether written reviews involve less emotional attitudes than spoken ones. Study 2 provides a more controlled test, examining whether, compared to speaking, writing leads consumers to express less emotional attitudes. Studies 3–5 further investigate modality's impact and test the role of increased deliberation through both mediation (study 3) and moderation (studies 4 and 5). A cross-study meta-analysis using a linguistic measure provides further evidence of deliberation's contributing role.

The studies also explore the consequences of this effect. Study 6, for example, tests whether by leading consumers to express less emotional attitudes, writing about a restaurant (rather than speaking) reduces others' likelihood of eating there. Further, it tests one reason why emotionality impacts persuasion (i.e., because it changes observers' perceptions of communicators' attitudes).

Note that additional mechanisms may also contribute to this effect. Writing is often more formal, creates a more permanent record, and involves a larger audience, less social presence, and communicating with someone not immediately available. These aspects may also reduce emotionality, and we explore them in greater detail in study 5.

STUDY 1: SPEAKING AND WRITING IN THE FIELD

Study 1 provides a preliminary test of speaking, writing, and emotionality in the field. We collect hundreds of written and spoken reviews and examine whether, consistent with our theorizing, written ones express less emotional attitudes.

Further, we begin to test the consequences of the effect. Research suggests that spoken reviews may be particularly impactful, yet marketers have little systematic understanding of the underlying mechanism (Wolk 2021). We test whether emotionality plays a role.

Method

Data. To control for variation across products, we compare written and spoken reviews of the *same* products. We take a number of products (e.g., headphones), and for each, collect the same number of spoken and written reviews.

We set out to compile a dataset of approximately 100 matched pairs of spoken and written reviews (total $N=200$) across at least 10 different products. It was

difficult to find a platform that contained both modalities. Amazon has many written product reviews, but few spoken reviews and YouTube offers many spoken reviews, but no written ones. Consequently, we looked across both platforms. Until 2014, Amazon reviews contain both helpful and unhelpful votes, allowing one to calculate impact ($[\text{helpful}/(\text{helpful} + \text{unhelpful})]$); [Chen and Lurie 2013](#); [Moore 2015](#); [Mudambi and Schuff 2010](#)), so we focused on one category (i.e., consumer electronics) and reviews prior to this point.

We started with a random sample of 250,000 consumer reviews from Amazon accessed at <https://cseweb.ucsd.edu/~jmcauley/datasets.html> ([He and McAuley 2016](#)), of which 157,649 had at least one helpful or unhelpful vote. To find individual products (i.e., a particular brand and model of headphones) with enough spoken and written reviews, a research assistant started with the product with the most Amazon reviews and searched for reviews for that same product on YouTube (i.e., search term = “product name + reviews”). If there were at least five reviews, they extracted the first available reviews (up to 15) following the order in which they appeared on the website (by number of views). In almost all cases, this included all YouTube reviews for the product.⁴ If the product had fewer than five YouTube reviews, they went to the next most-reviewed Amazon product and repeated the process. To ensure a diverse set of products, once a given product category (e.g., headphones) was represented by two different products (i.e., brand and model), they did not include any more from that category. Once there were YouTube reviews for 10 different products, we pulled a random sample of the same number of reviews for each of these products from the larger sample of Amazon text reviews. This resulted in a dataset of 110 product-matched video and text reviews (total $N = 220$) across 10 products (e.g., headphones, subwoofers, and camera lenses).

Measuring Emotionality. Each YouTube video was transcribed, and following prior work ([Rocklage, Rucker, and Nordgren 2018b](#); [Rocklage et al. 2021](#)), attitude emotionality was quantified using the Evaluative Lexicon. This computational tool contains a long list of 1,541 empirically derived words (e.g., “enjoyabl” and “impeccable”) rated by over 600 online participants (see [Rocklage et al. 2018b](#)) on their emotionality, or the degree to which they imply an emotional, feelings-based reaction (0 = Not at all

emotional, 9 = Very emotional), and valence. Words like “thrilled” and “breathtaking” are rated as indicating high emotionality (scores of 7.40 and 7.29 out of 9.00, respectively), for example, while words like “healthy” and “talented” are rated as implying lower emotionality (scores of 2.38 and 2.10), and words like “outstanding” and “impeccable” are rated as implying moderate emotionality (scores of 4.79 and 4.27).

One strength of the Evaluative Lexicon is that it differentiates between emotionality and other constructs. In addition to emotionality, the words are also scored on their valence (i.e., whether someone’s attitude is positive or negative, 0 = Very negative, 9 = Very positive) and extremity (i.e., how far their attitude deviates from the midpoint (4.50) of the valence scale). The words “enjoyable” and “impeccable,” for example, are both positively valenced, and nearly equal in extremity (i.e., approximately 3.00 out of 4.50), yet imply quite different degrees of emotionality or feelings. “Enjoyable” indicates a reaction that is based more on feelings (6.58 out of 9.00), whereas “impeccable” implies a reaction based less on feelings (4.27).

This tool has been validated many times ([Rocklage and Fazio 2015](#); [Rocklage et al. 2018b, 2021](#)). Words scored as implying greater emotionality appear more often alongside words indicating feelings (e.g., “I felt (. . .)”), for example, while lower emotionality words appear more often with words indicating a more cognitive response (e.g., “I believed” and “I considered”, [Rocklage and Fazio 2015](#); [Rocklage et al. 2018b](#)).

This measure has also been differentiated from other linguistic measures such as Linguistic Inquiry and Word Count (LIWC, [Pennebaker et al. 2015](#)) and [Warriner, Kuperman and Brysbaert’s \(2013\)](#) wordlist. While LIWC’s affect measure has been shown to measure language’s *valence* (i.e., positivity or negativity, [Reagan et al. 2017](#)), as noted, valence is a distinct construct from the level of emotion those attitudes are based on. Indeed, across five million online reviews, the correlation between LIWC’s measure of affect and Evaluative Lexicon’s emotionality is quite small ($r = .05$, [Rocklage et al. 2018b](#)). Instead, LIWC is strongly correlated with other measures of linguistic valence ($r \sim .75$, [Reagan et al. 2017](#)). Thus, the Evaluative Lexicon has been differentiated from other linguistic measures and is distinct in its provision of a well-validated measure of emotionality. Study 3 also demonstrates that our measure of emotionality tracks external judges’ ratings of perceived emotion, while LIWC’s affect measure and Warriner et al.’s arousal measures do not.

Following past work ([Rocklage and Luttrell 2021](#); [Rocklage et al. 2018b, 2021](#)), to isolate emotionality, it was measured through participants’ most emotional reaction (i.e., the emotionality score of their most emotional word), controlling for extremity (i.e., the extremity score of their most extreme word). We use this approach in this

⁴ While one could wonder whether the sampling method used encouraged the inclusion of particularly emotional YouTube reviews, this is unlikely. Such a concern might suggest that emotional reviews somehow rise to the top, and because we took the first appearing reviews on YouTube, but a random sample of reviews from Amazon, this drove the results. While this might be possible if there was a large sample of YouTube reviews for which the most emotional ones rose to the top, there were not enough reviews on YouTube for each product for this to be the case. In almost all cases, we selected *all* YouTube reviews for a given product, casting doubt on this alternative.

and all studies. Our key results persist, however, even when not controlling for extremity.

Results

As predicted, consumers expressed less emotional attitudes in written than spoken reviews ($M_{\text{written}} = 5.90$, $SE = .11$ vs. $M_{\text{spoken}} = 6.41$, $SE = .11$; $F(1, 217) = 9.99$, $p = .002$, $\eta^2_p = .044$).

Downstream Consequences. We also examined the link between emotionality and impact. Following prior work (Chen and Lurie 2013; Moore 2015), we used the helpfulness votes from Amazon (i.e., helpful/helpful + unhelpful) and the thumbs up and thumbs down votes on YouTube (i.e., thumbs up/(thumbs up + thumbs down)).

As predicted, reviews that expressed more emotional attitudes were more impactful ($b = .03$, $t(216) = 2.68$, $p = .008$, Cohen's $f^2 = .043$). This relationship persists controlling for various factors. First, maybe newer reviews are somehow both more emotional, and impactful, so we control for review age. Second, while we use matched sets of products, maybe the results are somehow driven by product category, so we control for that (i.e., using category dummies). Third, perhaps the number of ratings a review received is somehow driving the effect, so we control for this (results are the same using the log). Even including these various controls, though, more emotional reviews were still more impactful ($b = .03$, $t(205) = 2.41$, $p = .017$, Cohen's $f^2 = .186$).⁵

Mediation Analysis. Finally, consistent with our theorizing, a bias-corrected mediation model (PROCESS model 4; Hayes 2017) found that emotionality mediated the effect of expression mode on impact (95% CI: $[-.040, -.003]$). Reviewers express less emotional attitudes in written reviews ($b = -.52$, $t(217) = -3.16$, $p = .002$, Cohen's $f^2 = .096$) which decreased their impact ($b = .03$, $t(216) = 2.68$, $p = .008$, Cohen's $f^2 = .052$).

Discussion

Study 1 provides initial evidence for our theorizing in the field. Written reviews expressed less emotional attitudes than spoken ones. Further, the results provide preliminary evidence for an important consequence of this effect. Not only did written reviews express less emotional attitudes, but this reduced emotionality, in turn, reduced their impact.⁶

5 Expressing greater emotionality can sometimes backfire for utilitarian products, but if people explain their reactions by also including lower emotionality words along with their maximum emotionality (e.g., "I love it because it is sturdy"), then backfiring is less likely to occur (Rocklage and Fazio 2020). Consistent with this notion, the positive relationship between impact and maximum emotionality sustains ($b = .06$, $t(214) = 3.61$, $p < .001$) even after accounting for average emotionality ($b = -.07$, $t(214) = -2.77$, $p = .006$).

While these preliminary results are supportive, one could wonder whether they are driven by something other than modality. Even though the reviews were matched to be about the exact same products (i.e., brands and models), YouTube involves both speaking and video, and one could argue that YouTube videos are often edited and re-recorded, so they may not reflect some of the spontaneity of normal speaking. That said, note that if spoken reviews were planned out in advance (i.e., scripted), they should involve more deliberation, and thus should look more like written reviews, making it harder to find an effect of modality. Further, research assistants judged only nine spoken reviews as highly scripted and excluding those does not change the results. Alternatively, maybe YouTube reviews are more likely to be recorded by people who are influencers or received the product for free, though research assistants judged that this did not seem to be the case in this data.

Regardless, to directly test modality's causal impact, we turn to experiments.

STUDY 2: EXPERIMENTALLY MANIPULATING MODALITY

Study 2 uses an experiment to test modality's causal impact. We manipulate whether people express their attitudes toward a restaurant through speaking or writing. In addition, to test whether modality's effect holds for both positive and negative attitudes, we manipulated whether they talked about a restaurant they feel positively or negatively toward. We predict that regardless of opinion valence, writing should lead consumers to express less emotional attitudes.

Method

Participants ($N = 172$, recruited through a behavioral lab) completed an online study for payment. They were told the experimenters were interested in people's opinions of different experiences and were randomly assigned to condition in a 2 (expression modality: spoken vs. written) \times 2 (opinion valence: positive vs. negative) between-subjects design.

To ensure that expression modality did not change whether people discussed something they liked more or less, we manipulated opinion valence first. Participants were asked to think about a restaurant that they liked a lot (positive condition) or did not like very much (negative condition) and write it down. They generated places like Olive Garden, Chipotle, and Popeye's.

Next, we manipulated expression modality. In the written (spoken) condition, participants were asked to write

6 One could wonder whether word count could be driving the effect and we test this in more detail in study 2.

(speak) their opinion, as if they were talking about it to one of their good friends. Written condition participants wrote their opinion in a text box, while spoken participants spoke into a microphone.

A professional transcription company turned the audio files into text, and we measured the emotionality of attitude expression using the same methods as study 1.

Results

As predicted, a 2 (expression modality) \times 2 (opinion valence) analysis of covariance revealed only a main effect of expression modality (figure 1). Compared to people who spoke ($M = 5.50$, $SE = .15$), those who wrote their opinion expressed less emotional attitudes ($M = 5.06$, $SE = .14$; $F(1, 167) = 4.83$, $p = .029$, $\eta^2_p = .028$). While participants in the negative spoken condition said the food was “nasty” and the restaurant was “awful,” for example, those in the negative written condition expressed less emotional attitudes, saying the service was “lousy” and the restaurant was “mediocre.” Modality’s effect was not moderated by opinion valence ($F(1, 167) = .02$, $p = .88$, $\eta^2_p = .0002$), indicating that writing reduced emotionality in both positive and negative content.

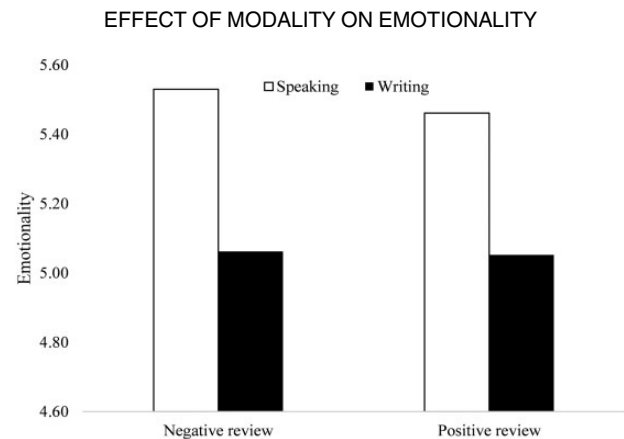
Discussion

Study 2 is consistent with the field data and provides direct causal evidence for modality’s impact. Regardless of whether they were expressing positive or negative opinions, compared to speaking, writing led people to express less emotional attitudes.

One could wonder whether the results are driven by production time. It takes longer to write than speak, so people usually produce less content when writing (Chafe and Tannen 1987, see web appendix for all study word counts). This, in turn, might lead people to cut extraneous information, which one could argue might reduce emotionality. That said, note that Melumad et al. (2019) finds the exact opposite: that generating briefer content encourages people to focus on the gist of an experience, which leads people to use *more* emotional language (not less).

Regardless, the results hold controlling for word count.⁷ Further, we specifically chose an outcome variable to avoid potential confounds with content length. While some work (i.e., LIWC) has used the percentage of emotional words to measure emotion, this can be biased by word count (Garten et al. 2018; Rocklage and Rucker 2019). The gist tends to focus on emotion (Melumad et al. 2019), but communication content beyond the gist may just involve filling in less

FIGURE 1



important or less emotional details. Consequently, using a measure that involves length might lead to the erroneous conclusion that speaking leads people to express less emotional attitudes (in this case, a smaller percentage of emotional words) simply because more content was created. By focusing on maximum emotionality, however, we avoid this potential concern, which is one of several reasons this measure is preferred (Rocklage and Luttrell 2021; Rocklage et al. 2018b).

Alternatively, one could wonder whether the results are driven by formality. Writing can be more formal or professional (Chafe and Tannen 1987), so perhaps writers expressed less emotional attitudes because they believe emotion is less formal. To test this possibility, a separate set of participants ($N = 152$) rated the degree to which each word in the Evaluative Lexicon conveys formality (0 = Not at all professional/formal; 9 = Very professional/formal; $M = 4.80$, $SD = 1.70$). While more emotional words were seen as slightly less formal, the correlation is quite small ($r = -.09$). Indeed, highly emotional words can be formal (e.g., “phenomenal”) or not formal at all (e.g., “mindblowing”). Further, while speaking did slightly decrease formality ($M = 4.06$ vs. 4.37 ; $F(1, 170) = 3.47$, $p = .064$, $\eta^2_p = .020$), even controlling for formality, modality’s effect on emotionality persisted ($F(1, 166) = 4.13$, $p = .044$, $\eta^2_p = .024$).

STUDY 3: THE ROLE OF DELIBERATION

Study 3 has two main goals. First, we test one reason why writing may lead people to express less emotional attitudes. We measure how much participants deliberated about what to say and test whether it mediates modality’s effect on attitude expression.

⁷ Word count (log transformed to correct for skewness) is not significantly related to emotionality ($F(1, 166) = .19$, $p = .66$, $\eta^2_p = .001$), and even when it is included in the analysis, the effect of modality is consistent ($F(1, 166) = 3.07$, $p = .082$, $\eta^2_p = .018$). Results are also consistent controlling for word count in other studies.

Second, we better control for the communication audience. One could argue that speaking somehow led study 2 participants to think about a closer other, which led them to express more emotional attitudes. While this seems unlikely, to rule it out, study 3 participants write a specific target down before being assigned to condition.

Method

Participants ($N = 60$, recruited through Mechanical Turk) completed an online study for payment. Given study 2 found no moderating effect of attitude valence, study 3 and subsequent studies focus on positive attitudes.

First, participants were asked to provide two sit-down restaurants that they like a lot. Then, for each, they listed the initials of a close other (i.e., friend or family member) who did not know about that restaurant and who they might tell about it. This information was collected before random assignment to expression mode, ensuring that condition did not impact the nature of the restaurants or communication audience listed.

Second, participants shared their attitudes. Participants were shown the name of a restaurant they listed, the initials of the corresponding person, and asked to imagine they wanted to tell that person about the restaurant. The only difference between conditions was expression mode. In the writing condition, participants wrote a message to them, and in the speaking condition, they recorded an audio message (see appendix for more detail). All participants completed both modality conditions, and everything was randomized including which modality was completed first and which restaurant was associated with which modality.

Finally, we measured the hypothesized underlying process (i.e., deliberation). Participants were asked how much they deliberated about what to say (1 = Didn't deliberate at all, 7 = Deliberated a great deal; $M = 3.87$, $SD = 1.87$).

Attitude emotionality was measured using the same approach as studies 1 and 2.⁸ Given each participant both spoke and wrote an opinion, we used mixed-effects modeling to account for the multiple opinions per participant (participant random effect) and participant mean-centered the continuous predictor variables (Hamaker and Muthén 2020).

Results

As predicted, and consistent with study 1 and 2, compared to speaking ($M = 6.52$, $SE = .19$), writing led people to express less emotional attitudes ($M = 5.89$, $SE = .19$; γ

$= -.32$, $t(58) = -2.74$, $p = .008$). When speaking, participants tended to express how "enjoyable" and "amazing" the restaurant was, for example, but they used less emotional language when writing, saying the restaurant was "excellent" and was one of their "favorite" places to go.

As expected, writing also increased deliberation ($M = 3.88$ vs. 3.48 ; $\gamma = .20$, $t(59) = 1.78$, $p = .080$), which predicted less emotional attitude expressions ($\gamma = -.23$, $t(57) = -1.72$, $p = .090$).

Finally, mediation analysis finds that deliberation contributed to modality's effect on attitude expression. Following prior work on mediation in mixed-effects models (Bauer, Preacher, and Gil 2006; MacKinnon et al. 2004), we used 20,000 Monte Carlo simulations to construct confidence intervals for the indirect effect of modality on emotionality via deliberation. There was some evidence in support of this indirect effect (84% CI: [.001, .106]).

Robustness to Emotionality Measure. While the results are consistent with our theorizing, one could wonder whether they are somehow driven by the measure used. Prior work has shown that the Evaluative Lexicon provides a more accurate measure of emotionality than other tools (Rocklage et al. 2018b), but to further demonstrate validity, we measure attitude expression through human ratings. Participants ($N = 201$) were shown the opinions from study 3 and asked to rate their emotionality ("How emotional was the person's description of the restaurant?" 1 = Not at all emotional; 7 = Extremely emotional).

Even using this alternate measure, however, results remained the same. Writing led people to express less emotional attitudes ($M = 4.10$ vs. 4.43 ; $\gamma = -.16$, $t(550.71) = -2.71$, $p = .007$). Further, the Evaluative Lexicon measure is strongly associated with the human ratings ($\gamma = .27$, $t(282.43) = 5.02$, $p < .001$), while LIWC (affect: $\gamma = -.02$, $t(387.36) = -.84$, $p = .40$) and Warriner et al.'s (2013) arousal measure are not ("max" arousal: $\gamma = .08$, $t(249.53) = .57$, $p = .57$; average arousal: $\gamma = -.08$, $t(329.68) = -.19$, $p = .85$). This underscores the notion that our dependent variable is capturing the emotionality of attitude expression, and that modality is impacting emotionality.⁹

⁸ While one could wonder whether written language might rely more on punctuation to convey emotionality, few participants (i.e., 5%) used exclamation points or any sort of emoticon to express emotionality in writing. Further, the fact that we find the same results using human coders (see Robustness), and that the Evaluative Lexicon is strongly associated with human ratings of emotions, underscores its value in capturing the emotionality of text.

⁹ One may wonder whether writing (vs. speaking) leads people to be less evaluative and whether this might lead to lower emotionality. To examine this possibility, we calculated the proportion of participants' language that was evaluative (i.e., number of EL words/total words). Across studies, participants were not less evaluative in their language when writing versus speaking (study 1: $p = .11$; study 2: $p = .43$; study 3: $p = .91$; study 4: $p = .52$; study 5: $p = .32$). Moreover, this proportion was not associated with external raters' perception of emotionality ($\gamma = -.58$, $t(374.72) = .27$, $p = .79$), indicating that evaluativeness differs from emotionality. We also examined whether the effects were similar for average, rather than max emotionality (see web appendix for more detail).

Discussion

Study 3 extends the findings of study 2 and demonstrates the hypothesized process behind modality's effect. First, as predicted, expression modality influenced what people shared: writing led people to express less emotional attitudes. Second, as predicted, deliberation contributed to these effects. Writing led participants to deliberate more about what to say, which in turn, led them to express less emotional attitudes.

Fixing both the attitude object and the communication audience casts doubt on the possibility that these factors could drive modality's effects. Finding the same results using alternate measures of emotionality speaks to their generalizability.

STUDY 4: PROCESS THROUGH MODERATION

Study 4 further tests whether deliberation is one reason writing leads people to express less emotional attitudes. If deliberation contributes to modality's influence, as we suggest, then exogenously encouraging deliberation should mitigate modality's effect. Encouraging speakers to take time to think about what to say should make them look more like writers and lead them to express less emotional attitudes. Study 4 tests this possibility.

Method

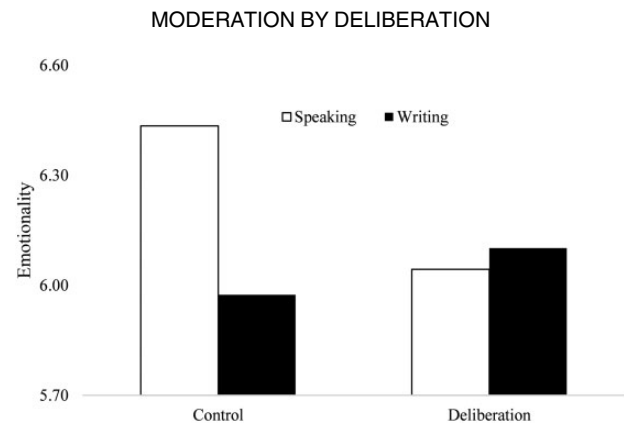
Methods were similar to study 3. Participants ($N=204$, Mechanical Turk) completed an online study for payment in a 2 (expression modality: speaking vs. writing) \times 2 (control vs. deliberation) mixed design. They were asked to list two restaurants they like, a person they might tell about each, and shared thoughts about each restaurant by writing or speaking.

Beyond manipulating communication mode, we also manipulated deliberation. For half the participants (control condition), there were no additional instructions, but for the other half (deliberation condition), we increased deliberation. Before sharing their opinions, participants were asked to take a few moments to think about what to say. Emotionality was measured using the same approach as in the other studies and we used the same analysis approach as study 3.

Results

Results revealed the predicted expression modality by deliberation interaction ($\gamma = .13$, $t(201) = -2.13$, $p = .034$, see figure 2). In the control condition, results were consistent with the first three studies. Compared to speaking ($M=6.43$, $SE = .13$), writing led people to express less emotional attitudes ($M=5.97$, $SE = .13$; $\gamma = -.23$, $t(201) = -2.90$, $p = .004$). Consistent with deliberation's

FIGURE 2



role in driving the effect of modality, though, increasing deliberation mitigated this effect ($M=6.04$, $SE = .15$ vs. 6.10 , $SE = .15$; $\gamma = .03$, $t(201) = .31$, $p = .76$).

Further, consistent with our theorizing, this mitigation was driven by how manipulating deliberation changed spoken communication. While deliberation had no effect on writers' emotionality ($M=5.97$, $SE = .13$ vs. 6.10 , $SE = .15$; $\gamma = .06$, $t(379.61) = .64$, $p = .52$), taking a moment to think before sharing led speakers to express less emotional attitudes ($M=6.43$, $SE = .13$ vs. 6.04 , $SE = .15$; $\gamma = -.20$, $t(379.61) = -1.97$, $p = .050$). Said another way, while writing naturally involves more deliberation, and thus leads people to express less emotional attitudes, encouraging speakers to deliberate reduced emotionality and made them look more like writers.

Discussion

Study 4 provides further evidence for expression mode's impact. As in the first three studies, compared to speaking, writing led people to express less emotional attitudes. Further, consistent with the notion that deliberation contributes to modality's effects, encouraging deliberation mitigated communication mode's impact and led speaking to look more like writing.

Rather than decreasing emotionality, one could ask why deliberation doesn't lead consumers to express *more* emotional attitudes. Work on the mere thought effect and attitude polarization (Clarkson, Tormala, and Leone 2011; Tesser, 1978; Tesser and Cowan, 1975), for example, suggests that thinking about a topic can lead the corresponding attitude to become more extreme (i.e., even more positive or negative than it was initially) because people tend to bring attitude-consistent arguments to mind. Importantly, however, as noted, *extremity* is quite different than *emotionality*, or whether the attitude is based on more or less

emotion. “Perfect” and “delightful” are equally extreme words (both highly positively valenced), for example, but the latter is more emotional, or based more on emotion. Thus, while deliberation has been shown to reliably decrease emotionality (Rocklage et al. 2021; Shiv and Fedorikhin 1999; Small et al. 2007), it may also increase attitude extremity, and this is one reason we controlled for extremity across studies. By controlling for how positive or negative consumers’ attitudes are (i.e., their extremity), the studies better test the impact of modality on emotionality and the unique consequences such emotionality has for receivers.

STUDY 5: OTHER CONTRIBUTING FACTORS?

Study 5 has four main goals. First, we test generalizability, having participants share opinions about any experience they want. Second, we further test whether deliberation helps drive modality’s effect, using a similar manipulation to study 4.

Third, we explore other contributing factors. While studies 3 and 4 suggest that deliberation plays a role, the impact of communication mode on emotionality may be multiply determined. Writing often is more formal or professional, creates more of a permanent record, and involves a larger audience, less social presence, and communicating with someone who is not immediately available. These aspects might also lead consumers to express less emotional attitudes.

Further, even if the actual levels of these aspects are the same across experimental conditions, the norms and habits associated with each modality could spill over to impact behavior. Both speakers and writers in study 2 thought about a single close other, for example, and knew they were being recorded, so both actual audience size and ephemerality were the same across conditions. But people may still write differently than they speak because they are used to expressing themselves differently across the two modalities. If speaking tends to involve smaller audiences, or be more ephemeral, consumers may apply those norms or habits even when they are less relevant. Writing or speaking could also be associated with particular goals (e.g., to persuade) which could shape emotionality. Consequently, to explore how these various factors might contribute to modality’s effect, study 5 measures them.

Fourth, we address some other explanations. One could wonder whether asking people to write a restaurant “review” in studies 2–4 made them think about writing in a more official manner. Alternatively, given prior work has manipulated rational thinking versus emotional responses by using think versus feel language (Mayer and Tormala 2010), perhaps deliberation in study 4 was confounded with the direction to think. To test whether these

possibilities could explain the effects, study 5 removes the word “review” from the instructions and replaces the word “think” with the word “deliberate” in the deliberation manipulation.

Method

The design was similar to study 4. Participants ($N = 256$, from Prolific) completed an online study using a 2 (expression modality: speaking vs. writing) \times 2 (control vs. deliberation) mixed design. They were told the experimenters were interested in “people’s opinions of different experiences” and asked to write down two experiences they liked a lot. Participants wrote down a range of different experiences including crafting, basketball, and traveling. Similar to study 4, for each experience, they also wrote the initials of someone they know well who did not know about that experience that they might tell about it. Then, similar to studies 3 and 4, they were randomly assigned to speak about one experience and write about the other, in randomized order.

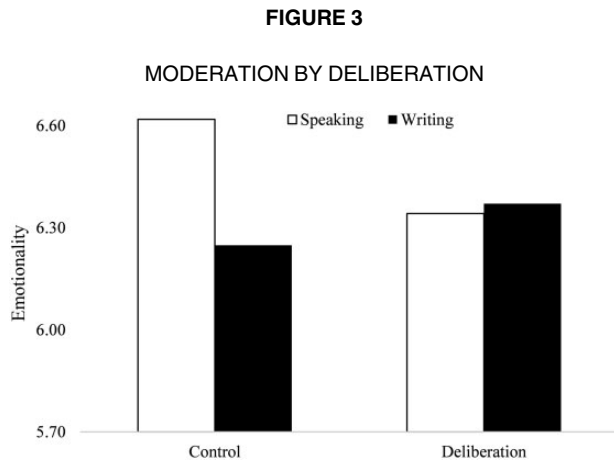
Beyond manipulating communication mode, we also manipulated deliberation. For half the participants (control condition), there were no additional instructions, but for the other half of participants (deliberation condition), we increased deliberation using a similar manipulation to study 4 (see [web appendix](#)). This time, however, the manipulation did not mention the word think, and participants were asked to take a few moments to deliberate about what to say.

Emotionality was measured using the same approach as the other studies, and the analysis approach was the same as studies 3 and 4. In addition, we collected a number of measures to explore other factors that might contribute to modality’s effect (detailed below).

Results

Analysis again revealed the predicted modality by deliberation interaction ($\gamma = .10$, $t(253) = 2.40$, $p = .017$, see [figure 3](#)). In the control condition, results replicated those found in the first four studies. Compared to speaking ($M = 6.62$, $SE = .10$), writing led people to express less emotional attitudes ($M = 6.25$, $SE = .10$; $\gamma = -.18$, $t(253) = -3.12$, $p = .002$). Consistent with deliberation’s role in driving the effect of modality, though, increasing deliberation mitigated this effect ($M_{\text{Spoken}} = 6.34$, $SE = .10$ vs. $M_{\text{Written}} = 6.37$, $SE = .10$; $\gamma = .01$, $t(253) = .24$, $p = .81$).

Further, consistent with our theorizing, this mitigation was again driven by how increasing deliberation changed spoken communication. While deliberation had no effect on writers ($M = 6.25$, $SE = .10$ vs. 6.37 , $SE = .10$; $\gamma = .06$, $t(469.25) = .88$, $p = .38$), taking a moment to deliberate before sharing led speakers to express less emotional attitudes ($M = 6.62$, $SE = .10$ vs. 6.34 , $SE = .10$; $\gamma = -.14$,



$t(469.25) = -1.99, p = .048$). Said another way, while writing naturally involves more deliberation, and thus led people to express less emotional attitudes, encouraging speakers to deliberate more reduced emotionality and made them look more like writers.

Other Potential Contributing Processes. We also test whether other processes might contribute to modality's effect. To avoid the possibility that the deliberation manipulation might bias things, we examine whether these factors can explain why writing led people to express less emotional attitudes in the control condition.

First, as noted in study 2, writing can be more formal or professional (Chafe and Tannen 1987), so perhaps writers expressed less emotional attitudes because they believe expressing emotion is not formal or professional. To test this possibility, participants were asked about the norms or habits associated with both speaking and writing ("How formal are each of these types of communication usually?" 1 = Not at all formal, 7 = Extremely formal).

Second, one could wonder whether social presence might play a role. While people often speak face-to-face, writing usually involves communicating with someone who is not present. This reduced social presence, in turn, might reduce emotionality. Further, even if modality differences in actual social presence were muted in studies 2–4 (because both speaking and writing involved communicating with someone who was not present), norms or associations with different modalities may have carried over to impact emotionality. To test this possibility, for both speaking and writing, participants were asked: "How much do each of these types of communication usually involve audiences that are not physically present?" (1 = Not at all, 7 = A great deal).¹⁰

10 While one could ask these questions about the specific situation of the study, note that there were no actual differences between speaking and writing on many of the measures (e.g., actual audience size,

Third, one could wonder whether audience size might play a role. While phone calls usually involve only one other person, for example, written social media posts are often seen by a much larger audience, and people might express less emotion to larger groups. Again, even if modality differences in audience size were muted in studies 2–4 (because both speaking and writing involved communicating with only one other person), norms or associations with different modalities may have carried over to impact emotionality. To test this possibility, for both speaking and writing, participants were asked: "How many other people usually see each of these types of communication?" (1 = Very few, 7 = A large number).

Fourth, one could wonder whether audience closeness might play a role. Writing might tend to involve closer or more distant others, which might impact emotionality. Further, even if modality differences in audience closeness were muted in studies 2–4 (because participants in both conditions communicated with someone who was equally close), norms or associations with different modalities may have carried over. To test this possibility, for both speaking and writing, participants were asked: "How close are communicators usually with their audiences in each of these types of communication?" (1 = Not at all close, 7 = Extremely close).

Fifth, one could wonder whether ephemerality might play a role. While written communication usually creates a permanent record, oral communication usually disappears right after it occurs. Consequently, people might express less emotional attitudes when writing because they are concerned there will be a record of what they said. Again, even if modality differences in ephemerality were muted in studies 2–4 (because participants knew that both conditions involved recording their opinions), norms or associations with different modalities may have carried over. To test this possibility, for both speaking and writing, participants were asked: "How much of a record is usually there of each of these types of communication?" (1 = No record at all, 7 = A permanent record).

Sixth, one could wonder whether real-time information exchange might play a role. Writing usually occurs when someone is not immediately available to receive a communication, which might somehow decrease emotionality. Further, even if modality differences in real-time information exchange were muted in studies 2–4 (because participants in both conditions communicated with someone who was not there), norms or associations with different modalities may have carried over. To test this possibility, for both speaking and writing, participants were asked: "How much do each of these types of communication usually involve real-time back and forth exchange of information?" (1 = Not at all, 7 = A great deal).

closeness, and physical presence), so asking about general norms and associations seemed more appropriate.

But none of these six alternatives mediated the effect. While control participants noted that writing tends to be more formal ($\gamma = .40$, $t(129) = 5.07$, $p < .001$), less ephemeral ($\gamma = 1.11$, $t(129) = 12.46$, $p < .001$), and involve less social presence ($\gamma = 1.29$, $t(258) = 13.27$, $p < .001$ ¹¹), with larger ($\gamma = .55$, $t(129) = 4.89$, $p < .001$) and more distant audiences ($\gamma = -.76$, $t(129) = -8.81$, $p < .001$), and less back and forth ($\gamma = -1.39$, $t(129) = -16.85$, $p < .001$), none of these factors explained modality's effect on emotionality. Specifically, using the same Monte Carlo mixed-effects modeling approach as in study 3, none of the indirect effects were significant, whether all of the factors were entered simultaneously in one parallel mediation analysis (formality 95% CI: [-.056, .059]; social presence 95% CI: [-.092, .195]; audience size 95% CI: [-.099, .014]; closeness 95% CI: [-.131, .067]; ephemerality 95% CI: [-.126, .165]; real-time information exchange 95% CI: [-.287, .082]) or each was entered individually (formality 95% CI: [-.050, .051]; social presence 95% CI: [-.312, .003]; audience size 95% CI: [-.100, .007]; closeness 95% CI: [-.133, .037]; ephemerality 95% CI: [-.149, .099]; real-time information exchange 95% CI: [-.284, .044]). The parallel mediation model also found no significant total indirect effect (95% CI: [-.409, .206]), suggesting that even considering all of these norms as a group, they did not explain modality's effect on emotionality.

Discussion

Study 5 further demonstrates that communication modality shapes attitude expression, as well as how deliberation contributes to this effect. Writing led people to express less emotional attitudes because it is naturally more deliberative, but encouraging deliberation mitigated the impact of communication mode and led speaking to look more like writing.

As with many phenomena, writing's effect may be multiply determined. Beyond deliberation, writing and speaking often differ on numerous dimensions (i.e., ephemerality, formality, audience size, audience closeness, physical presence, and real-time exchange of information) which may also contribute to differences in attitude expression. This may occur directly (i.e., speaking is usually more ephemeral) or indirectly (i.e., even when speaking is not more ephemeral, the norms, associations, habits, or goals associated with different modalities may carry over). Though we do not observe strong evidence for these factors in study 5, they may play larger roles in other situations.

11 The degrees of freedom here differ from the other comparisons because the random effects of participant could not be estimated. This suggests that there may not be enough variation between participants in terms of their ratings of the perceived physical presence between modalities. The implications of this are that each participant's observation is treated as separate, but the conclusions remain the same.

META-ANALYTIC EVIDENCE

To further test deliberation's role in driving modality's effect, we use a linguistic measure. Analytic thinking (Jordan et al. 2019; Kacewicz et al. 2014; Pennebaker et al. 2014) captures "a deliberate mode of thought" (Jordan et al. 2019, 3477) that is more formal, hierarchically organized, and characterized by careful, effortful deliberation. Deliberate thought often involves complex concepts being broken down into more manageable components and the relationships between them. Thus, the Analytic linguistic measure includes grammatical articles (e.g., "a" or "the" which signal concepts), prepositions (e.g., "in" or "on" which convey relationships between concepts), and other language features. Analysis of political language, for example, found that Donald Trump, known for speaking off the cuff, scored much lower on this measure of deliberation than many other politicians (Jordan et al. 2019).

Consequently, to further test whether deliberation helps explain modality's effects, we conducted a meta-analysis of language across studies (McShane and Böckenholt 2017). We took the content from each study (i.e., studies 1, 2, 3, and the baseline conditions of studies 4 and 5) and scored it on this measure.¹² Then, using fixed effects to control for individual studies, we examined the relationships between modality, this linguistic measure of deliberation, and emotionality.

Results indicate that deliberation mediates the effect of communication mode on emotionality. Consistent with the main results, writing led people to express less emotional attitudes than speaking ($M = 5.97$, $SE = .29$ vs. $M = 6.43$, $SE = .29$; $\gamma = -.23$, $t(628.45) = -6.18$, $p < .001$). Further, as predicted, writing is associated with higher levels of the linguistic measure of deliberation ($M = 62.60$, $SE = 1.82$ vs. $M = 42.62$, $SE = 1.80$; $\gamma = 9.99$, $t(639.20) = 14.01$, $p < .001$). In addition, as predicted, the linguistic measure of deliberation was negatively correlated with emotionality ($\gamma = -.01$, $t(977.68) = -3.18$, $p = .002$). A Monte Carlo mediation analysis finds that deliberation mediated the effect of communication modality on emotionality (95% CI: [-.078, -.020]).

STUDY 6: DOWNSTREAM CONSEQUENCES

The final study experimentally tests the downstream consequences of modality's impact on attitude expression. Imagine a friend told you about a movie. Could the fact that they wrote, rather than spoke to you, change the

12 We do not include study 6 as it focuses only on downstream consequences, and it includes no new content, just content created in study 2. Given study 1 focuses on expression modes in the field, we also conducted additional analyses without this study. The meta-analysis results do not change and remain highly significant.

emotionality of the language they use to talk about the film, and thus your interest in going to see it? Study 1 suggests this possibility, but study 6 tests it in a more controlled setting to better demonstrate causality.

Importantly, while we are interested in attitude emotionality, this is not the only way expression mode might impact word of mouth recipients. Speaking also often involves less formal language, more words produced, paralinguistic cues, and other aspects (Chafe and Tannen 1987; Schroeder and Epley 2015; Van Zant and Berger 2020), all of which might independently impact observer attitudes. While an in-depth investigation into how modality impacts word of mouth recipients is beyond the scope of this article, we simply examine whether, by leading consumers to express less emotional attitudes, communicating attitudes through writing can reduce persuasion.

Finally, we examine *why* expressing less emotional attitudes might reduce persuasion. Emotion may signal someone's attitude (Rocklage and Fazio 2018), and consequently, even beyond its positivity or negativity, attitudes imbued with greater emotionality may indicate that communicators had an impactful experience (i.e., one that had the ability to elicit a feelings-based reaction). When speaking positively about a restaurant, for example, using the word "enjoyable" instead of "superior" might lead observers to infer the communicator likes the restaurant more, which might make them more interested in trying it themselves. We test whether even when using equivalently positive language, using language that implies greater feeling might increase impact.

Method

Participants ($N = 301$, Mechanical Turk) were asked to imagine that someone they know told them about a restaurant and answered some questions based on what that person shared.

Participants were randomly assigned the language from one of the opinions expressed by a study 3 participant, and based on it, completed the dependent measure: how interested they would be in trying the restaurant (1 = Not at all interested; 7 = Extremely interested). In addition, to capture the underlying process, they rated how emotional the description of the restaurant was (1 = Not at all emotional; 7 = Extremely emotional) and how much they thought the communicator liked the restaurant (1 = Not at all; 7 = A great deal). Participants completed this process four times, responding to opinions expressed by four different study 2 participants.¹³ Given random assignment, participants could have been exposed to both modalities across the four opinions or just one modality. To avoid the restaurant's name biasing responses, they were removed, as were any greetings (e.g., "Hi Susan").

Given each participant rated multiple opinions, and each study 3 content producer shared multiple opinions, we participant mean-centered the continuous predictor variables (Hamaker and Muthén 2020) and extended the mixed-effects modeling approach from studies 3–5 to account for both sources of variance. Specifically, we used random effects to capture the variance attributable to the audience and communicator.

Results

We begin with the simplest model, examining whether emotional language drove any effect of modality on participants' interest in the restaurant. Following standard practice (Hayes 2017), each step of the model controlled for the previous step's variables to estimate each construct's unique effect. As predicted, a Monte Carlo mediation approach finds that expression mode influenced observer attitudes through attitude emotionality (95% CI: $[-.064, -.002]$). As shown in the prior studies, modality impacted emotionality; writing led content producers to express less emotional attitudes ($\gamma = -.32, t(58) = -2.74, p = .008$). This, in turn, led participants to be less interested in eating at the restaurant ($\gamma = .09, t(786.30) = 2.33, p = .020$).

To explore why, we investigated whether, as hypothesized, perceived emotionality shaped how much recipients thought the communicator liked the restaurant. We used the same models as above, but also included perceived emotionality and perceived liking as serial mediators (figure 4). As above, writing led producers to express less emotional attitudes ($\gamma = -.32, t(58) = -2.74, p = .008$). This, in turn, led recipients to perceive opinions as less emotional ($\gamma = .20, t(768.91) = 5.13, p < .001$), which led recipients to infer communicators liked the restaurant less ($\gamma = .34, t(879.98) = 16.39, p < .001$), which led recipients to be less interested in eating there ($\gamma = .68, t(879.48) = 14.58, p < .001$; see figure 4). The resulting 95% confidence interval did not include 0, indicating a significant indirect effect (95% CI: $[-.027, -.004]$). As in prior studies, each pathway controls for linguistic extremity, demonstrating the distinct effects of emotionality. These results provide additional evidence that writing led communicators to express less emotional attitudes, which in turn reduced communication's impact.

Discussion

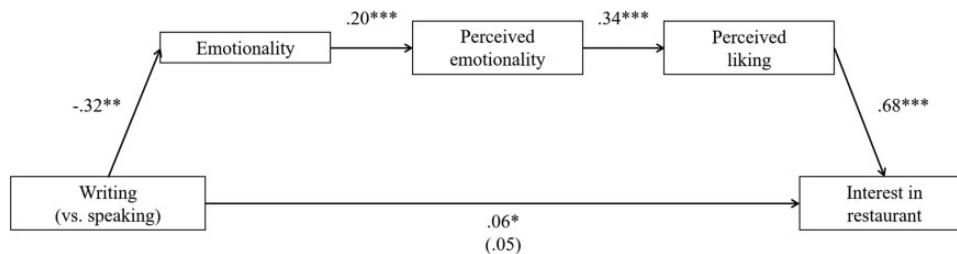
Study 6 further demonstrates the downstream consequences of modality's effects and provides insight into why they occur. First, not only does writing lead consumers to express less emotional attitudes (studies 1–5), but this, in turn, decreased observers' interest in trying the liked product.¹⁴ This holds even when taking the same

13 Due to a technical error, 28 participants only saw three reviews.

14 We do not mean to suggest that attitude emotionality is the only way modality can impact word of mouth recipients. Modality may

FIGURE 4

WRITING DECREASES INTEREST BY DECREASING EMOTIONALITY AND PERCEIVED LIKING



* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

review and replacing a less emotional word (“superior”) with a more emotional one that is equally positive (i.e., “enjoyable” see study 7 in the web appendix).

Second, these results also demonstrate a reason *why* emotionality increases impact. Greater use of feelings-based language (e.g., “enjoyable” vs. “superior”) leads observers to infer communicators hold more extreme (in this case, more positive) attitudes, which makes observers more persuaded. Given each path of the model controls for the actual linguistic extremity of the review, these results indicate that feelings-based language provides a signal of a communicator’s attitude above-and-beyond its implied positivity. Thus, while the extremity and emotionality of individuals’ attitudes are related (Rocklage and Fazio 2015), this study also reinforces that they can have separable and simultaneous effects—both extremity and emotionality increased observers’ perceptions of communicators’ liking.

Taken together, these findings contribute to the literature on attitudes, and emotional expression, deepening understanding around the underlying process that drives these effects.

GENERAL DISCUSSION

Expressing opinions is an integral part of consumer behavior. Consumers talk about movies they like and airlines they hate. Further, such word of mouth has an important impact on what others choose and buy. Consequently, companies are investing more and more resources in driving and managing word of mouth.

But while it is clear that expressing attitudes is both frequent, and important, less is known about whether the mode consumers use to express their opinions might shape what they express (and the impact of that expression).

impact the way people perceive word of mouth, and consumers may use different modes to talk to stronger and weaker ties, or talk about different types of products. Hopefully, future work will explore these possibilities in greater depth.

Six studies explore these topics in both the laboratory and field. First, consistent with our theorizing, compared to speaking, writing led consumers to express less emotional attitudes (studies 1–5). Replicating this in both between- and within-subjects designs, across multiple methods of collecting opinions, different product categories, in the lab and field, and multiple measures of attitude emotionality speaks to its robustness.

Second, the studies demonstrate that deliberation contributes to this effect. Writing tends to involve more deliberation, which, in turn, leads people to express less emotional attitudes. Demonstrating these effects through both mediation (study 3 and meta-analysis) and moderation (studies 4 and 5) and measuring deliberation through both self-report (study 3) and a linguistic measure (meta-analysis) underscores their generalizability. Other factors (e.g., social presence, audience size and closeness, ephemerality, formality, synchronicity, norms, associations, goals, production time, and the amount of content produced) may also contribute to the effect.

Third, the studies demonstrate managerially relevant consequences. Compared to speaking, written opinions were less impactful, and persuasive, because they involved less emotional attitudes (studies 1 and 6).

Implications

These findings have a number of important implications. First, while research on the psychological drivers of word of mouth has begun to explore *what* people talk about (e.g., one product, brand, or experience, versus another) and *why*, there has been less attention to *how* they talk about those things, or the *type* of content shared. In particular, not just whether the discussion is positive or negative, but the language used (Berger and Iyengar 2013; Melumad et al. 2019). We contribute to this emerging space, demonstrating that something as seemingly trivial as the modality consumers communicate through can have an important impact on what they say.

Second, the results have implications for a number of related literatures. For attitudes researchers, the findings highlight the importance of considering how expression mode might impact the opinions people express. Further, they demonstrate that even beyond attitude extremity, attitude emotionality can be an important cue to infer how much someone likes something. For information processing and decision-making researchers, this work suggests that modality may shape how affective cues color judgment and choice (Darke, Chattopadhyay, and Ashworth 2006). Similarly, for emotions researchers, the findings highlight when and how language carries emotion, and novel consequences this may have. For example, emotion researchers who commonly examine participants' written expressions may be missing out on the richer emotional content available in spoken communications.

Third, the findings may help explain observed differences between online and offline word of mouth. Research has found large differences in content (Fay and Larkin 2017) and suggests that offline word of mouth has a bigger impact (Keller and Fay 2009). Similarly, spoken reviews have been shown to have particularly strong effects on customer purchase decisions (Wolk 2021). Some of these effects may be driven by differences outside of modality, but our results suggest that modality may also play a role. While online word of mouth is more commonly written, most offline word of mouth occurs face-to-face or on phone calls, which involve speaking rather than writing. Our results suggest this may not only lead offline word of mouth to involve more emotional attitudes, but potentially to have more impact.

Fourth, the fact that modality impacts emotionality has a number of substantive implications. When planning a vacation, for example, talking versus writing should change the emotionality of the discussion, which may change the weights placed on different attributes in choice. When interacting with customer service, phone calls may increase emotionality, which may lead to better (or worse) outcomes for the customer and the firm. And for psychotherapy, asking patients to write down how they feel should reduce emotional expression, which may either be beneficial or detrimental, depending on the goal. Word of mouth itself is said to be an important way consumers manage their psychological well-being (Berger 2014; Rimé 2009). If so, expression modality may be an important factor in the extent to which word of mouth motivated by things like venting, sensemaking, or generating social support offer meaningful "consumer therapy."

More generally, in situations where the goal is to increase emotional expression, speaking may be better. Websites that want to increase the impact of their reviews might also want to encourage spoken or video reviews or encourage consumers to dictate reviews using speech-to-text. Not only will such reviews contain more emotional attitudes, and thus have more impact, given the link

between emotionality and sharing (Berger and Milkman 2012), this may also increase the likelihood people pass them on to others.

That said, if the goal is to avoid emotion, writing may be better. When considering whether or when to offer voice versus text-based customer service, for example, companies might consider how this will impact the emotionality of customer (and agent) language. Similarly, doctors or lawyers may want to write down thoughts in advance before communicating information with patients or clients. When shifting modalities is not an option, though, taking a moment to deliberate before speaking should have similar effects.

Fifth, other factors that impact deliberation may have similar effects. When consumers know a certain conversation will take place, for example, this may give them a chance to think more about what to say, which should reduce emotionality. Communication audience may also play a role. People may be more deliberate when talking to a boss, for example, or in an interview, and this, in turn may reduce emotionality.

Sixth, this work highlights the importance of distinguishing between effects of modality itself versus other correlated factors. Communication involves a modality (i.e., speaking or writing), but it also involves a specific channel (e.g., face-to-face, phone, or text) and audience (e.g., friend, neighbor, or stranger). These aspects also impact the content produced. Even within writing, for example, writing on a smartphone rather than desktop computer tends to lead to more emotional language because the small keyboard focuses communicators on the gist (Melumad et al. 2019). Similarly, within speaking or writing, talking to a larger versus smaller audience (Barasch and Berger 2014), or weaker versus stronger ties (Dubois et al., 2016), also impacts what people share. Consequently, the overall content produced is shaped by the combination of modality, channel, and audience (Oba and Berger 2021).

But while multiple factors certainly shape content production, features of modality should still lead it to have separable effects. Different ways of writing may themselves encourage or discourage emotionality, but compared to speaking, the nature of writing itself makes it much easier to separate content production from content expression. Whether writing on computer or smartphone, for example, writing things down allows communicators to produce content that they can then edit or rearrange before sharing. Speaking, in contrast, is constrained by memory. Even if someone has the time or interest in deliberating before sharing, they can only hold so many things in their head, making revision more challenging. Thus, while things like channel and audience may certainly moderate modality's effects, the effect of modality is likely to persist.

Directions for Future Research

One area for future research is the role of communication goals. While writing tends to involve more

deliberation, people tend to deliberate less when they vent, or are already emotional (Stanovich and West 2000). Consequently, it may be interesting to examine how venting and writing combine to shape attitude emotionality. Someone who wants to vent, for example, may be less likely to deliberate and thus more likely to express emotional attitudes. That said, controlling for the fact that someone is venting, writing may still reduce emotionality.

How people write may also moderate the effect. Today, most writing is done on a keyboard or smartphone, and a smartphone's physically constrained nature may encourage emotional expression relative to other writing tools (Melumad et al. 2019). But how might writing by hand impact attitude emotionality? While it is hard to say for sure, if writing by hand encourages more fluid thought or imagination, it may boost emotionality. Research could also examine whether the effect holds in written mediums such as texting where norms may be more in line with spoken communication.

Speech to text technologies may have similar moderating effects. While these tools allow people to easily turn their voice into written form, they also subtly shift the process of content creation. Because one often has to speak slowly, or take breaks between sentences, this may encourage more deliberation than is common in oral communication. This, in turn, may lead people to express less emotional attitudes.

Research could also examine cases where content production and content delivery occur through different modalities. In most cases, the modalities are the same. When people speak to friends, for example, they produce and deliver content orally. In some cases though, these two aspects occur through different modes. When someone gives a planned speech, for example, they deliver that speech orally but likely wrote down what to say in advance, and thus content production occurred through writing. In such situations, content production mode likely shapes attitude expression.

Textual paralinguage (Luangrath et al. 2017) could also be examined. Participants rarely used emojis or emoticons in our studies, but some people use these features when communicating online or via text. Future work might examine how people express emotional attitudes through both language and textual paralinguage.

While we focused on attitude expression, future research could also examine whether consumers subjectively *feel* less emotion when writing. Deliberation can decrease felt emotion (Rocklage et al. 2021; Small et al. 2007), and writing about a distressing experience (vs. neutral topic) can lead to less emotional reactivity over time (Park et al. 2016). Consequently, writing may lead consumers to feel less emotion. Along these lines, because sharing highlights certain aspects of one's attitudes, it might also change communicators' attitudes as well.

One could also examine moderators of attitude emotionality's impact on audiences. Things like product category, type of purchase, or consumption modality might shift persuasion (Dai, Chan, and Mogilner 2020). Emotionality can have less of a positive impact on persuasion in utilitarian product categories, for example (Rocklage and Fazio 2020), and the same language may also have different effects depending on whether it is consumed visually or auditorily.

We focused on how expression mode impacts observers through attitude emotionality, but it might also have other direct effects. Consumers may be more likely to follow spoken recommendations because it is more difficult to process auditory information, which leads people to rely on heuristics to make decisions (Munz and Morwitz 2020). Hearing someone speak can also make them appear more human (Schroeder and Epley, 2016; Schroeder et al. 2017) which might boost persuasion. Expression mode may also impact how confident someone seems, and while it is easy to go back and re-read what someone wrote, this is harder to do for spoken opinions, which should have a variety of downstream consequences.

We focused on the role of deliberation in language production, but one could also examine its role in language consumption. Consuming spoken versus written content, for example, might change how much recipients deliberate, and thus communication's impact.

Research could also examine antecedents of the modality effect. Contextual factors likely shape whether people speak or write. Communicating with someone who is physically present, for example, tends to involve spoken communication, while communicating with someone who is far away is often likely to involve writing. People may also be more likely to speak to close ties, for example, or when they want to communicate something particularly nuanced.

Conclusion

In conclusion, while consumers frequently express their attitudes to others, and such expression has important consequences, there has been less attention to how different communication modalities might shape the attitudes consumers express, and thus their impact. By understanding more about different communication modes, channels, and audience factors, we can shed new light on both the language underlying word of mouth, and its effects.

DATA COLLECTION INFORMATION

The data for studies 2 and 3 were collected online through MTurk in 2020. The data for studies 4, 5, 6, and 7 were collected online through MTurk in 2021. The first author collected the data for studies 2–7, and the second author analyzed it. The third author collected the data for

study 1 and analyzed it. The data are stored on the second and third authors' computers.

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