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Mixed Messages: II. Outcomes Associated with the Proportion and Placement of Negative Statements in Support Messages

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ABSTRACT
Few studies on emotional support have investigated mixed messages – instances when emotional support messages contain both positive and negative statements. Although researchers have recognized that mixed messages occur, most supportive communication research has ignored these ambivalent messages. We contend based on the negativity bias that the more negative statements that occur in an emotional support message, the less effective the message is. To test this possibility, we presented cancer patients ($N = 417$) with messages that consisted of 0%, 20%, 40%, 60%, or 80% negative statements. Patients rated the messages on five variables: message effectiveness, affective improvement, supporter competence, likelihood to seek future support, and being better off if the supporter had said nothing. A significant positive linear trend occurred for all five variables. The results suggest that the presence and amount of negative statements within an emotional support message has a considerable influence on the recipient's perception of the message and supporter. From a practical standpoint, the results suggest that cancer patients' supporters should act cautiously when communicating negative statements within supportive messages, as even a brief negative statement may cause irreparable damage to the overall quality of a support message.

Social support research has consistently documented the efficacy of supportive messages in cultivating positive personal and relational outcomes for recipients under duress. Having access to adequate support has been associated with benefits ranging from greater psychological adjustment to decreases in overall morbidity and premature mortality (Cohen, Gottlieb, & Underwood, 2000; Holt-Lunstad, Robles, & Sbarra, 2017). It is clear that, when expressed effectively, social support often improves individuals' personal and social lives, but this effect is particularly important when a support recipient's health is at stake (Robinson et al., 2019; Tian, Solomon, & Smith, 2019).

Research on social support in the cancer context, for instance, finds that effective social support can lead to improved health behavior, reductions in inflammation, and improved coping and adaptation, among other outcomes (Gonzalez-saenz de Tejada et al., 2016; Reblin & Uchino, 2008). Although social support for cancer patients can occur in various forms (see Cutrona & Suhr, 1992), multiple studies have shown that cancer patients find emotional support messages in particular to be more helpful or encouraging than tangible, informational, or instrumental support (Chesler & Barbarin, 1984; Dakof & Taylor, 1990; Dunkel-Schetter, 1984; Trobst, 2000).

Nevertheless, support providers do not always communicate emotional support effectively, even when intending to do so. For example, individuals may (in)advertently include statements of negativity or criticism in their attempts to be supportive, and research demonstrates that the inclusion of negativity affects recipient perceptions of an overall message. More specifically, recent work finds that the presence of a brief negative statement in a supportive message has a negative effect on perceptions of message effectiveness and on perceptions of support provider competence (Ray et al., 2019).

Given the importance of effective emotional support in cancer contexts, and recent work suggesting that negativity plays a key role in supportive outcomes, the goal of this study was to explore how the proportion of negativity included in support messages influenced cancer patients' perceptions of personal outcomes, as well as their perceptions of support provider effectiveness and competence at alleviating distress. For this study, we assessed varying ratios of negativity in supportive messages, primacy versus recency in the placement of negative messages, and their unique as well as combined effects on cancer patients' perceptions. Below, we detail the theoretic framework utilized for this study as well as corresponding literature suggesting that supportive message perceptions may differ depending on message valence and primacy.

Negativity bias

Abundant research supports the idea that humans embody a negativity bias in which negative affective stimuli have

a greater influence than do positive stimuli (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Royzman, 2000). Indeed, the negativity bias presents itself across a number of social situations and the research consistently shows that negative stimuli produce stronger effects on a variety of outcomes (see Baumeister et al., 2001). For example, negative social information has a stronger effect than positive information on one's final impression formation of another person (Ito, Larsen, Smith, & Cacioppo, 1998).

Importantly, Royzman (2000) noted that negativity's dominance over positivity is on display most glaringly when positive and negative stimuli occur together. That is, negative aspects of an event can ruin the positive aspects of the same event (Kanouse & Hanson, 1972). This phenomenon has been investigated previously in the context of support behaviors toward spouses with cancer (Manne, Taylor, Dougherty, & Kemeny, 1997). The study measured support in terms of frequency of a variety of behaviors, and the results showed that spouses' negative support behaviors had a stronger influence than their positive behaviors. Recently, communication researchers have begun investigating the blending of positive and negative statements within supportive messages (i.e., mixed messages), to determine how support recipients react to messages that simultaneously include supportive and problematic statements (Ray et al., 2019). The results showed that messages that included a negative statement (such as criticizing how the cancer patient disclosed their diagnosis) within an otherwise supportive message were rated significantly lower in terms of message effectives and supporter competence in comparison to messages without negative statements.

As such, we contend that emotional support messages are evaluated differently depending upon their ratio of positive versus negative content. We surmise that messages with any amount of negative statements will be evaluated worse than messages without negative statements. Furthermore, we contend that as the amount of negative statements increases, evaluations of messages and supporters will decrease. Specifically, based on the notion that the negativity bias has cognitive and affective consequences (Vaish, Grossmann, & Woodward, 2008), we contend that higher ratios of negativity in a support message will influence cancer patients' perceptions of support message effectiveness and affective improvement. We hypothesize that:

H1a: Cancer patients' ratings of support message effectiveness exhibit a positive linear relationship with the ratio of positivity included in a supportive message.

H1b: Cancer patients' self-reports of affective improvement after receiving a support message exhibit a positive linear relationship with the ratio of positivity included in a supportive message.

In addition, recent work suggests that the presence of negative statements in a supportive message is significantly associated with lower ratings of supporter competence (Ray et al., 2019). We seek to reconfirm this finding with the following hypothesis:

H1c: Cancer patients' ratings of supporter competence exhibit a positive linear relationship with the ratio of positivity included in a supportive message.

Given the notion that support messages with higher positivity will prompt increased perceptions of message effectiveness, affective improvement, and perceived competence, it is likely then that this will influence recipients' perceptions of the current and future support seeking process. As Ray and Veluscek (2017) find, when people receive unhelpful support they may retaliate by no longer sharing future updates with that person or turning to them for support. Likewise, we posit that:

H1d: Cancer patients' likelihood of seeking support from a supporter in the future has a positive linear relationship with the amount of positivity included in a supportive message.

Research on social support has also looked at recipients' feelings that they would be better off if the supporter had said nothing at all (i.e., preference for nonsupport). Specifically, participants were more likely to prefer nonsupport if the support message blamed or criticized the recipient (Ray & Veluscek, 2018). To confirm this, we posit that:

H1e: Cancer patients' perceptions of the extent to which they believe they would have been better off had the supporter said nothing at all increase when the ratio of negativity in a supportive message is higher.

Primacy vs. recency effect

In addition to the negativity bias, placement of positive and negative content within a support message could also affect message outcomes. Some research has argued that a primacy versus recency effect exists when individuals are presented with information. Essentially, the primacy versus recency effect argues that inconsistent messages (e.g., a combination of both high- and low-quality support messages) may affect individuals differently based on whether the low-quality elements appear first or last (Steiner & Rain, 1989).

The attention decrement hypothesis may explain the primacy effect. That is, people are more likely to pay greater attention to information they receive early in an interaction and less likely to pay attention to later stimuli (Steiner & Rain, 1989). Other viewpoints maintain, however, that if individuals are able to remain open to newly occurring information, then a recency effect may occur instead because individuals would not be maintaining previously formed impressions (Gergen & Gergen, 1981). Based on differing viewpoints as to whether primacy or recency effects are more potent, we pose a set of research questions to assess whether placement of positive and negative support statements influences perceptions of support message effectiveness, affective improvement, supporter competence, future support seeking, and the belief one would be better off had the supporter said nothing at all:

RQ1: How, if at all, do cancer patients' ratings of a) message effectiveness, b) affective improvement, c) supporter competence, d) likelihood of seeking support from the supporter in the future, and e) the belief they would have been better off had the supporter said nothing at all differ depending on whether the negative portion of a support message occurs at the beginning or end of the message?

Finally, given the possibility that the positivity effect could vary according to the placement of positive portions (at either the beginning or end of the message), we pose an additional set of research questions asking whether amount of positivity interacts with placement.

RQ2: How, if at all, do cancer patients' self-reports of a) message effectiveness, b) affective improvement, c) supporter competence, d) likelihood of seeking support from the supporter in the future, and e) the belief they would have been better off had the supporter said nothing at all differ based on the interaction between the amount of positivity in a support message and the placement of the negative portion of a support message?

Methods

Participant recruitment

All procedures were conducted under the approval of an Institutional Review Board. Prospective participants were recruited from an NCI-designated Comprehensive Cancer Center using a database of current and former patients who had consented to being contacted for participation in various cancer-related studies and had an e-mail address on file. Inclusion criteria was a cancer diagnosis in the last 3 years and at least one treatment visit in one of the clinics which treat the four most prevalent cancer types in the US: breast, lung, colorectal, and prostate. A total of 1184 patients were contacted via e-mail regarding the opportunity to participate in an online questionnaire. There were 507 patients who started the survey; however, 90 participants were removed because they did not complete enough of the survey to provide data on any of the five dependent variables. The remaining 417 participants comprised the study's sample.

Participant demographics

Participants ($N = 417$) were 353 women, 55 men, and nine adults who chose not to disclose their biological sex. Participants ranged in age from 30 to 85 years ($M = 61.72$ years; $SD = 11.19$). The majority (87.5%) identified as White, whereas 4.8% were Hispanic/Latino(a), 3.1% were African American/Black, 3.1% identified as having multiple ethnicities or being of other ethnic origins, 1.2% were Asian/Pacific Islander, and one participant chose not to disclose his or her ethnicity. Participants were diagnosed with one of four types of cancer: breast cancer (70.3%), thoracic/lung (19.9%), digestive (7.9%), or prostate (0.7%). Five participants chose not to disclose their cancer type. Self-reported time since initial cancer diagnosis ranged from .08 to 30 years ($M = 3.27$ years; $SD = 3.45$). Cancer staging ranged from stage 0 to stage 4; however, stage 1 (30.5%) and stage 2 (26.4%) were most frequently reported.

Procedures

The first page of the questionnaire was an informed consent form that overviewed the purpose of the study. Those who agreed to participate provided demographic information and were asked to identify someone they know whom they could imagine communicating a supportive message. Specifically, they were asked to identify someone they know well, but to whom they did not directly disclose their cancer diagnosis. Participants were asked to write the initials of this person's name and report the person's biological sex and provide a rating of relational closeness. The majority (66.9%) of participants chose a woman, whereas 29.5% chose a man, and 3.6% did not disclose the biological sex of the supporter they had in mind. Participants also self-reported their relational closeness to the supporters they chose on a 7-point scale ($M = 3.84$; $SD = 1.99$).

The next page of the survey displayed one of 18 supportive messages (randomly selected) that varied in both the amount of positive and negative sentences and the placement of the positive sentences within the message. All support messages were 100 words long and composed of five 20-word sentences. Participants viewed and rated just one of the 18 messages. After reading the message, participants rated the message and the supporter on a variety of outcome measures, described later in the manuscript. The questionnaire concluded with an opportunity for participants to provide an e-mail address to be entered into a raffle for one of five $50 Visa e-gift cards. Additional details regarding the process of pilot testing the 18 support messages used in this study is described in the following section.

Pilot testing

Each of the 20-word sentences was developed through extensive pilot testing so that the 100-word support messages received by the participants systematically varied in the ratio of the message that was positive or negative. We conducted a pilot study to test numerous 20-word supportive sentences for their valence, in order to identify sentences that were statistically equal in their levels of positivity or negativity. Data were collected using Amazon's crowdsourcing platform Mechanical Turk (MTurk). One hundred adults (61 male, 39 female) took part in the pilot study. Participants ranged in age from 21 to 65 years ($M = 34.86$ years, $SD = 10.60$). Most (82) identified as White, whereas 8 identified as Black/African American, 5 as Asian/Pacific Islander, 3 as Hispanic, 2 as Native American or Aleut, and 1 as Latino/a (these frequencies sum to >100 because participants could select multiple racial or ethnic identities). At the time of the study, 28 participants had a high school diploma or less, 3 had completed a vocational or trade school diploma, 14 had an associate's degree, 45 had a bachelor's degree, and 9 had a graduate degree (1 participant declined to report his or her education level). Participants represented 31 U.S. states plus the District of Columbia.

Participants completed a questionnaire that framed the study in this way:

> Some people aren't sure what to say when a loved one is diagnosed with a serious illness, such as cancer. Some people are good at providing support, whereas others find it difficult to say supportive things, especially if they learned of the diagnosis secondhand.

Participants were then asked to imagine that they had received such a diagnosis. We first asked them to read a series of 21 statements that reflected messages "you might receive from someone who is upset about how he or she learned of your diagnosis." These were the negatively worded statements, and participants were asked to rate the valence of each statement on a scale of 1 (*Very negative*) to 7 (*Very positive*).

Next, participants were asked to imagine receiving each of 24 positively worded statements of support and to rate the valence of each statement on the same scale. For both the positive and negative statements, each participant saw the statements in a randomized order. An attention check question was also included within the statements. All 100 participants answered the attention check correctly.

Following data collection, we identified five positive statements that scored highly on positivity but whose positivity scores did not differ significantly. We then identified four negative statements that scored low on positivity but whose positivity scores did not differ significantly. We subsequently combined these 20-word statements to create two versions each of the messages that were 100, 80, 60, 40, and 20 percent positive.[1]

Outcome measures

Message effectiveness

Goldsmith, McDermott, and Alexander's (2000) three-factor support message effectiveness scale was utilized to measure message effectiveness. The scale consists of 12 seven-point semantic-differential-type items that are equally distributed across three factors (relational assurances, emotional awareness, and problem-solving utility). Due to the three factors being highly intercorrelated (average $r = .955$), the authors decided to collapse the three factors into a single factor. This single-factor version of this scale demonstrated excellent internal reliability ($\alpha = .99$). Examples of adjective pairs include "Insensitive/Sensitive" and "Upsetting/Reassuring."

Affective improvement

The extent to which participants felt less upset after reading the message (i.e., affective improvement) was measured using five items derived from Clark et al.'s (1998) Comforting Responses Scale. Items were measured on 7-point Likert-type items (1 = *Strongly Disagree*; 7 = *Strongly Agree*). The five items drawn from the Comforting Responses Scale were the same five that Jones (2004) extracted from the scale when measuring affective improvement. In prior studies, the affective improvement subscale yielded Cronbach's alpha scores ranging from .85 to .93. In the present study, the scale demonstrated a similar level of internal reliability ($\alpha = .95$). Examples of items include

"I feel better after hearing the person's message" and "This person made me feel better about myself."

Supporter competence

Participants' perceptions of supporters' competence when communicating support were measured using the supportiveness subscale that Jones (2004) derived from the Ratings of Alter Competence (RAC) scale (Cupach & Spitzberg, 1981). This factor originally consisted of 11 items, but three items were discarded as they require the participant to have conversed with the supporter as opposed to reading a single message (e.g., "she or he was a good listener"). The remaining eight items were measured on 7-point Likert-type scales (1 = *Strongly Disagree*; 7 = *Strongly Agree*) and demonstrated strong internal reliability ($\alpha = .95$). Example items include "The person was polite" and "The person was sympathetic."

Likelihood to seek support in the future

Each participant was asked to report the likelihood of seeking support from the supporter in the future had they received the message in the study. To capture this, the researchers used a six-item subscale from the Utrecht Coping List (Schreurs, Willige, Tellegen, & Borsschot, 1988), which measures seeking emotional support, advice, and tangible aid. The Likert-style items have four possible responses (Never, Sometimes, Often, and Very Often) and demonstrated excellent internal reliability ($\alpha = .96$). Example items include asking the participant about future likelihood to "Share your worries with the person" and "Discuss your problems with the person."

Perception of being better off not receiving a support message

A single 7-point Likert-style item (1 = *Strongly Disagree*; 7 = *Strongly Agree*) measured the extent the participant felt they would have been better off had the supporter said nothing at all, instead of communicating the message received.

Additional measures

Relational closeness

The Inclusion of Self in Other (IOS) scale (Aron, Aron, & Smollan, 1992) was used to measure the participant's self-reported relational closeness to their selected supporter. The scale consists of a single pictorial measure composed of a series of seven Venn-like diagrams that vary in the degree to which the two circles overlap. The participant was told the two circles represent the participant and the supporter. Each Venn-like diagram was assigned a number from one to seven (1 = *no overlap of the two circles*; 7 = *almost complete overlap of the two circles*). The participant was asked to select the set of circles that best illustrates their relationship with the supporter and the corresponding number for the chosen set of circles was used as the relational closeness data.

Message realism

Using a 7-point Likert-style item (1 = *Strongly Disagree*; 7 = *Strongly Agree*), participants indicated their level of agreement with the statement "This message was realistic" ($M = 3.80$; $SD = 1.83$).

Position	Control		Primacy								Recency							
Positivity	100%	100%	80%		60%		40%		20%		80%		60%		40%		20%	
Version	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7A	7B	8A	8B	9A	9B

Figure 1. Partially nested design used in the analysis.

Data analysis

We analyzed each of the dependent variables separately using a 3 (position) X 5 (amount of positivity) X 18 (message replications) design, with the last factor random. We included participants' biological sex and ratings of relational closeness to the supporter as covariates in the analyses. The fixed effects for percentage and position of positive messages constitute a partially nested design (Maxwell & Delaney, 1990), with all five levels of percentage appearing in the primacy and recency levels of the position variable–percentage does not appear in the control (which, as noted, does not contain negative message elements). The design is presented in visual form in Figure (1).

We used the R function *lmer* from the *lme4* package to evaluate the data and treated message replications as a random factor nested within positivity (Jackson, 1992). Because *lmer* does not produce degrees of freedom for statistical tests, we report Type I error rates as provided by the *lmerTest* package (Kuznetsova, Brockhoff, & Christensen, 2017). The package uses the Satterthwaite approximation for the degrees of freedom with restricted maximum likelihood as the estimator. All hypotheses and research questions were evaluated at *alpha* = .05.

Results

Descriptive statistics

The five dependent variables are highly and positively associated. (The scale is reversed for the variable "I would be better off having not received support.") Descriptive statistics for the five dependent variables and the covariate relational closeness appear in Table 1. Means by experimental condition, collapsed across message replications, appear in Table 2, which highlights the partially nested character of the design.

The two covariates, relational closeness and participant's biological sex were significant for all five of the dependent variables (See Table 3). Men had higher scores on all of the dependent measures and relationship closeness was positively associated with all independent measures except for perception of being better off not receiving a support message.

Hypothesis 1a-e

Hypothesis 1 predicts a linear relationship across the five levels of positivity in the messages for all five dependent variables: a) message effectiveness, b) affect improvement, c) supporter competence, d) likelihood of seeking future support, e) being better off had the supporter said nothing. Parameter estimates for the five dependent variables across the set of predictors are provided in Table 3. The amount of variance accounted for (conditional R^2) by the models ranges from .197 to .389. Statistical tests for positivity were significant ($p < .05$) for all five dependent variables: message effectiveness, $F(4, 8.34) = 13.6$; affective improvement, $F(4, 8.41) = 9.84$; supporter competence, $F(4, 8.5) = 10.85$; likelihood to seek future support, $F(4, 7.3) = 4.93$; and being better off if the supporter said nothing, $F(4, 8.58) = 3.76$.

Given that the statistical tests for the five dependent variables were significant, we evaluated the hypothesis using a set of orthogonal polynomial contrasts. With five positivity conditions the number of possible contrasts is four, the first of which is linear, the second quadratic, the third cubic, and the fourth quartic. Although the first hypothesis predicts linear trends for the five dependent variables, we were interested in whether higher-order trends applied. The linear contrast was significant ($p < .05$) for all five dependent variables, with estimates = 2.46 ($z = 6.72$), 1.75 ($z = 5.77$), 0.43 ($z = 3.61$), 1.98 ($z = 5.73$), −2.01 ($z = −3.45$), for message effectiveness, affective improvement, supporter competence, likelihood of seeking future support, and being better off had the supporter said nothing, respectively. In addition, the quadratic trend was significant for both message effectiveness b = 1.05 ($z = 2.88$) and supporter competence, b = 0.99 ($z = 2.85$), indicating that the trend flattens somewhat for the middle positivity conditions. Figure (2) contains a graph of the means for each dependent variable by positivity.

Research questions 1a-e

The first set of research questions investigated whether cancer patients' ratings of messages on the five dependent variables differed depending on whether the negative portion of the

Table 1. Intercorrelations, means, standard deviations, and ranges of study variables (N = 417).

Variable	1	2	3	4	5	6	M	SD
1. Message Effectiveness	–						3.51	1.95
2. Affective Improvement	.78**	–					2.88	1.66
3. Supporter Competence	.81**	.81**	–				3.44	1.64
4. Likelihood to Seek Future Support	.59**	.64**	.67**	–			1.66	.73
5. Better Off Receiving No Message	−.59**	−.56**	−.63**	−.43**	–		4.37	2.17
6. Relational Closeness	.19**	.25**	.16**	.34**	−.10	–	3.84	1.99

**p < .01.

Table 2. Means and standard deviations by position and positivity (N = 417).

Positivity Condition	Control					Primacy					Recency				
	Affect	Better	Competence	Effective	Future	Affect	Better	Competence	Effective	Future	Affect	Better	Competence	Effective	Future
100%	4.54 (1.32)	2.31 (1.63)	5.51 (1.13)	6.06 (0.96)	2.10 (0.77)	–	–	–	–	–	–	–	–	–	–
80%	–	–	–	–	–	3.14 (1.64)	3.92 (1.92)	3.74 (1.58)	4.05 (1.66)	1.67 (0.65)	3.32 (1.61)	4.03 (2.06)	3.87 (1.51)	3.95 (1.89)	1.80 (0.89)
60%	–	–	–	–	–	2.82 (1.72)	4.47 (1.97)	3.22 (1.55)	3.48 (1.65)	1.62 (0.74)	2.68 (1.72)	4.78 (2.27)	3.11 (1.68)	3.27 (1.81)	1.54 (0.70)
40%	–	–	–	–	–	2.57 (1.54)	4.66 (2.11)	3.05 (1.32)	2.92 (1.75)	1.61 (0.79)	2.72 (1.65)	4.97 (2.03)	3.30 (1.56)	2.99 (1.95)	1.61 (0.76)
20%	–	–	–	–	–	2.20 (1.08)	4.95 (2.07)	2.71 (1.14)	2.75 (1.57)	1.47 (0.52)	1.93 (1.22)	5.22 (2.05)	2.44 (1.14)	2.06 (1.31)	1.50 (0.58)

Note. Standard deviations in parentheses.

message occurred at the beginning or end of the message. The partially nested design that resulted from having two control conditions without negative statements requires an adjustment to the analysis strategy for both RQ1a-d and RQ2a-e. That is, we evaluated the main effect of primacy on the five dependent variables by excluding the control condition from each analysis. Consistent with the statistical tests reported for hypothesis 1, we included the main effect for percentage of support, the interaction between primacy and percentage of support, and participant sex and relational closeness as covariates. None of the main effects for primacy were significant ($p > .05$), with $F(1, 7.51) = 0.93$, $F(1, 7.62) = 0.23$, $F(1, 7.64) = 0.05$, $F(1, 6.75) = 0.07$, and $F(1, 7.7) = 0.57$ for effectiveness, affect improvement, supporter competence, future support, and better off saying nothing, respectively.

Research questions 2a-e

The second set of research questions explored whether an interaction between positivity and primacy occurred for the five dependent variables. None of the statistical tests for the interaction were significant ($p > .05$) for any of the five dependent variables: message effectiveness $F(4, 8.37) = 0.47$; affective improvement $F(4, 8.45) = 0.13$; supporter competence $F(4, 8.53) = 0.1$; likelihood of seeking future support $F(4, 7.33) = 0.06$; and being better off had the supporter said nothing $F(4, 8.61) = 0.17$.

Discussion

Given the positive psychological and relational outcomes of receiving high-quality emotional support, researchers have endeavored for decades to determine what makes certain support messages more efficacious than others. Much previous research, for instance, has demonstrated the influence of verbal person-centeredness (VPC: Burleson, 2003; High & Dillard, 2012). VPC indexes how responsive a message is to the feelings and perspectives of its target. Highly person-centered messages, which acknowledge and legitimize the emotions and experiences of a distressed other, are consistently perceived as more socially supportive than messages that are moderate or low in person-centeredness (Bodie, Burleson, & Jones, 2012; High & Dillard, 2012).

Although the effects of VPC are robust, the current study focused instead on the emotional tenor of support messages

and the extent to which the relative proportions and placement of positive and negative statements within a support message affected the message's perceived effectiveness. On the basis of the negativity bias, we predicted that negative statements within a message influence cancer patients' perceptions of the entire message, even if most of the statements within a message are positive. The results supported our hypotheses, as all five dependent measures had significant positive linear trends based on the proportion of a support message composed of negative statements.

We also explored the possibility that the placement of negative statements within a message affects cancer patients' ratings of the entire message. Nonsignificant results showed that neither a primacy nor a recency main effect occurred, nor were there significant interactions between placement and proportion of negativity. Together, the significant results from H1a-e and the nonsignificant results involving placement of negative statements suggests that recipients are influenced adversely by negative statements embedded within emotional support messages regardless of their placement within the message.

Implications

One implication of these findings is that, in the construction of high-quality social support messages, VPC is not the only characteristic that matters. It should be noted that what distinguishes high, moderate, and low levels of VPC is not the emotional valence of a message, but rather, its responsiveness to the receiver's emotions and perspectives. Messages that are low in VPC are not necessarily negative in valence; instead, they minimize or dismiss the recipient's feelings. In response to a friend's distress at losing a relationship, for example, a low-person-centered message might be "Well, there are plenty of other fish in the sea." Such a message ignores the friend's current distress, making it a low-VPC message, but the content of the statement is not emotionally negative. The current findings suggest that the valence – or, in some cases, ambivalence – of a message is also influential in determining how the message will be received.

From a practical standpoint, our results caution cancer patients' supporters against including negative statements of criticism, blame, or dismay within otherwise positive statements of emotional support. Samter and MacGeorge (2016) asserted that "people do not respond to individual

Table 3. Tests for Hypothesis 1.

| Effect	Message Effectiveness		Affective Improvement		Seek Future Support		Supporter Competence		Better Off No Message	
	Estimate (SE)	95% CI LL – UL	Estimate (SE)	95% CI LL – UL	Estimate (SE)	95% CI LL – UL	Estimate (SE)	95% CI LL – UL	Estimate (SE)	95% CI LL – UL
Intercept	2.00*** (0.39)	1.23 – 2.76	1.40*** (0.33)	0.76 – 2.05	2.22*** (0.36)	1.50 – 2.93	1.03*** (0.13)	0.77 – 1.29	5.42*** (0.61)	4.23 – 6.60
Positivity: 40%	0.20 (0.52)	-0.82 – 1.22	0.34 (0.43)	-0.51 – 1.19	0.34 (0.49)	-0.63 – 1.30	0.15 (0.17)	-0.19 – 0.49	-0.13 (0.83)	-1.75 – 1.49
Positivity: 60%	0.65 (0.51)	-0.36 – 1.66	0.54 (0.43)	-0.29 – 1.38	0.39 (0.49)	-0.56 – 1.35	0.11 (0.17)	-0.22 – 0.44	-0.44 (0.82)	-2.05 – 1.16
Positivity: 80%	1.26* (0.52)	0.25 – 2.27	0.99* (0.43)	0.15 – 1.83	0.89 (0.49)	-0.06 – 1.85	0.15 (0.17)	-0.18 – 0.48	-0.92 (0.82)	-2.54 – 0.69
Positivity: 100%	3.35*** (0.52)	2.34 – 4.36	2.45*** (0.43)	1.61 – 3.29	2.86*** (0.49)	1.90 – 3.81	0.68*** (0.17)	0.35 – 1.01	-2.78*** (0.82)	-4.39 – -1.17
Sex	0.89*** (0.23)	0.43 – 1.34	0.63** (0.21)	0.21 – 1.05	0.68*** (0.20)	0.29 – 1.08	0.20* (0.10)	0.01 – 0.39	-0.80** (0.29)	-1.36 – -0.23
Relationship Closeness	0.17*** (0.04)	0.09 – 0.25	0.20*** (0.04)	0.12 – 0.27	0.12*** (0.04)	0.05 – 0.19	0.11*** (0.02)	0.08 – 0.15	-0.11* (0.05)	-0.21 – -0.01
Positivity/Recency: 40%	-0.66 (0.51)	-1.67 – 0.35	-0.27 (0.43)	-1.10 – 0.57	-0.29 (0.49)	-1.25 – 0.66	-0.01 (0.17)	-0.34 – 0.32	0.50 (0.82)	-1.10 – 2.11
Positivity/Recency: 60%	-0.06 (0.52)	-1.08 – 0.96	0.05 (0.43)	-0.80 – 0.89	0.11 (0.49)	-0.85 – 1.07	-0.07 (0.17)	-0.41 – 0.26	0.24 (0.83)	-1.38 – 1.86
Positivity/Recency: 80%	-0.16 (0.51)	-1.17 – 0.85	-0.10 (0.43)	-0.93 – 0.74	0.00 (0.49)	-0.95 – 0.95	-0.04 (0.17)	-0.37 – 0.29	0.31 (0.82)	-1.29 – 1.92
Positivity/Recency: 100%	-0.18 (0.53)	-1.23 – 0.87	-0.12 (0.45)	-1.00 – 0.75	-0.02 (0.50)	-1.01 – 0.96	0.01 (0.18)	-0.34 – 0.36	0.22 (0.84)	-1.42 – 1.87
Random Effects										
σ^2	2.40		2.05		1.80		0.43		3.73	
τ_{00}	0.16		0.09		0.16		0.01		0.51	
Observations	386		386		386		386		386	
Marginal R^2 / Conditional R^2	0.349 / 0.389		0.260 / 0.291		0.301 / 0.357		0.180 / 0.197		0.180 / 0.279	

Note. * $p<0.05$ ** $p<0.01$ *** $p<0.001$
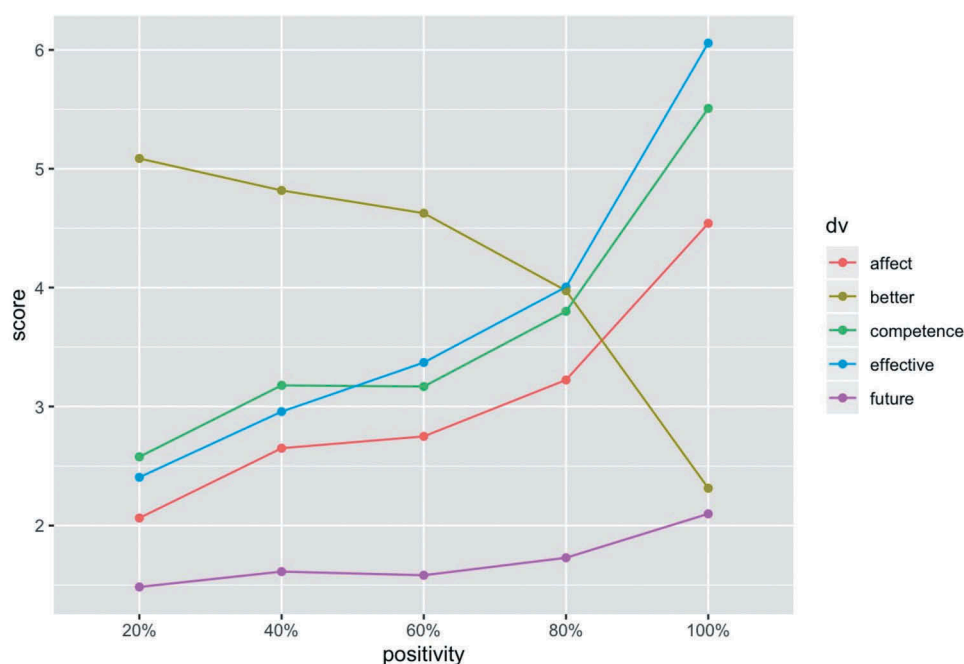
Figure 2. Graph of dependent variable means by positivity.

components of a message; rather, they respond to the overall effect these components combine to achieve" (p. 122). The present findings support this assertion by suggesting that even a single brief negative statement may cause irreparable damage to the overall quality of a support message. Interestingly, the nonsignificant results obtained when testing for primacy and recency effects suggest that the placement of negative statements has no effect on the overall perception of the message. That is, if considering expressing dismay with a loved one for their cancer treatment choice or method of disclosing the diagnosis, there appears to be no advantage either to front-loading the message with negativity or ending the message by expressing one's frustrations.

Strengths, limitations, and future directions

As with any research endeavor, our study exhibited strengths and endured limitations; however, we believe the limitations discussed below also allow us to identify opportunities for future research directions. First, regarding participant demographics, our sample was predominantly White and female. Whereas the lack of diversity was not unexpected given that most patients at the particular cancer center from which we recruited are White, the lack of male participants should be considered when interpreting our study's results. That being said, we did include the participant's biological sex as a control variable in our statistical analyses as an attempt to address the unequal number of male and female participants.

Recruiting cancer patients as study participants was a strength of this study. Although the experimental design relied on these patients receiving a hypothetical emotional support message, having recently diagnosed cancer patients provide message ratings results in a level of external validity beyond what would be obtained from a convenience sample

from the general population who are told to imagine having cancer. Obviously, other aspects of the study design threatened the external validity, including the fact that the patients were receiving messages that were systematically developed by the research team. This decision, however, was purposefully made and allowed for the adjudication of the research questions while controlling for several potentially confounding variables.

Furthermore, the decision to utilize an experimental design in this study suggests the need for future mixed messages studies that utilize naturally occurring conversations between cancer patients and their supporters to verify our findings further. Such an approach would allow researchers to observe the effects of nonverbal communication on perceptions of mixed messages. Whereas the present study focused on text-based messages that are devoid of nonverbal communication, it could be that the nonverbal aspects of face-to-face supportive interactions can override or mitigate any negative evaluations that occur as a result of receiving negative statements. For one, the tone, facial expressions, and general amount of nonverbal immediacy used by the supporter when conveying negative statements within mixed messages would likely affect how these negative portions are interpreted and used to evaluate the entire message and the supporter (Jones & Wirtz, 2007).

Finally, given that a cancer diagnosis is typically an ongoing stressor that will require multiple moments of support, researchers should investigate which portions of mixed messages are recalled in the days and weeks after receiving such messages. Are there certain phrases that occur within supportive messages and interactions that are recalled more frequently and what predicts the recall of certain support messages at a later date? The negativity bias would suggest that negative statements would receive greater cognitive processing and would have a lingering effect in one's memory (see Baumeister et al., 2001). Another potential pathway

would be to measure real-time physiological markers of arousal, such as increases in skin conductivity, which may show certain messages receive greater attention and cognitive processing and are subsequently more likely to be recalled. In addition, it may be informative in future research to cross message valence with VPC to examine their potential interaction. Do negative statements have differential effects within high-, moderate-, or low-person-centered support messages? If so, then this provides an additional opportunity to extend existing research and to make support messages even more effective for recipients.

Note

1. The statements from the pilot test, their mean valence scores and standard deviations, as well as the message versions created by combining these statements are available from the corresponding author upon request.

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Disclosure of potential conflict of interest

The authors declare no conflicts of interest

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