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The influence of affective behavior on impression formation in interactions between black cancer patients and their oncologists

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Abstract

Objective: Black patients and their physicians tend to form relatively negative impressions of each other, and these may contribute to racial disparities in health outcomes. The current research tested the hypothesis that the interaction between positive and negative affective behavior predicts the most positive impressions in clinic visits between Black patients and their oncologists.

Method: Naïve coders rated patients' and oncologists' positive and negative affective behavior in thin slices from 74 video recorded clinic visits. We examined whether (a) physician positive affect, negative affect, or their interaction predicted patients' perceptions of patient-centeredness, trustworthiness, and confidence in recommended treatments and (b) patient positive affect, negative affect, or their interaction predicted physicians' perceptions of patient cognitive ability, likelihood of treatment adherence, and likelihood of treatment tolerance. We also tested whether affective behavior mediated relationships between race-related attitudes and post-visit impressions or influenced post-visit impressions independently of attitudes.

Results: When oncologists displayed relatively high levels of both positive and negative affect, patients were more confident in recommended treatments but did not rate physicians higher in patient centeredness or trustworthiness. When patients expressed relatively high levels of positive and negative affect, oncologists perceived patients to be higher in cognitive ability and more likely to adhere to treatment recommendations, but no more likely to tolerate treatments. Affective behavior influenced impressions independently of race-related attitudes.

Conclusions: Positive and negative affective behaviors jointly contribute to impression formation in clinic visits between Black patients and oncologists, and may have implications for patient treatment and outcomes in this underserved patient population.

Keywords

Cancer; Affective behavior; Impression formation; Race/ethnicity; Racial disparities

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1. Introduction

Affective behavior—verbal and nonverbal displays of emotion, mood, and other feeling states—is a significant factor guiding impression formation. In the context of medical care, the impressions that physicians and patients form of each other have important implications for patients' health outcomes (van Ryn et al., 2006; Penner et al., 2014, 2016b; Street et al., 2009). The influence of these impressions may be especially important in interactions between Black patients and their physicians because we know that Black patients typically interact with non-black physicians (Hamel et al., 2015) and that they tend to view each other less positively than they do Black physicians or White patients, respectively (Shen et al., 2017; Street et al., 2007; van Ryn and Burke, 2000). Identifying factors that contribute to more positive impression formation in this context is of significant practical importance as we work towards reducing racial health disparities. The current research contributes to a growing literature on the role of communication in the quality of Black patients' oncology clinic visits, specifically during discussions of cancer treatment options, by examining how affective behaviors conveyed by Black patients and their oncologists during clinic visits influence the impressions they form of each other.

1.1. Affective communication and medical interactions

Verbal and nonverbal communication during clinic visits provides patients and physicians with information that can influence impressions and health outcomes (Levine and Ambady, 2013; Gordon et al., 2006). Affective behavior, specifically, may have important implications for impression formation in Black patients' clinic visits (Penner et al., 2013; Levine and Ambady, 2013). In non-medical settings, affective behavior has been shown to signal information about others' current emotional states, interpersonal intentions, and personalities (Knutson, 1996; Van Kleef, 2010); it facilitates effective communication, helping people to navigate complex social situations (Boiger and Mesquita, 2012). For example, expressing sadness or anxiety can evoke sympathy and support; smiling may elicit positive feelings like calmness or hope (Fischer and Manstead, 2008).

The expression of positive affect is associated with a host of positive inferences, including honesty, pleasantness, and sincerity (for a review, see Hess et al., 2002). Past research demonstrates that people prefer smiling physicians to inexpressive ones (Lill and Wilkinson, 2005), and that physician expression of positive affect is associated with patients' perceptions of patient-centeredness (Henry et al., 2017). Physicians perceive patients expressing positive affect to be better communicators, more satisfied with care, and more likely to adhere (Street et al., 2007). More research is needed, however, to better understand whether the expression of negative affect in medical settings is beneficial. Negative emotions are, in general, viewed as socially undesirable (Bastian et al., 2012; Koopmann-Holm and Tsai, 2014), so the expression of negative affect may lead to negative impressions. In one study, physicians' use of words conveying negative affect was associated with being less liked by patients (Falkenstein et al., 2016). In another, patients receiving results from a worried physician felt more anxious and recalled less information than those receiving results from a nonworried physician (Shapiro et al., 1992). On the other hand, negative affect is a typical response to a cancer diagnosis, and people perceive others more positively when

they conform to emotion norms and expectations (Blumenthal, 2005; Perry-Parrish and Zeman, 2011). Street et al. (2015) found physician expression of negative affect was associated with increased adherence, suggesting negative affective behavior may be useful in this context.

The effect of negative affective behavior on post-visit outcomes may depend, in part, on whether positive affect is also displayed. Positive and negative affect often co-occur within interactions, and they can have different implications when expressed together than either does when expressed alone (Hershfield et al., 2013; Miyamoto et al., 2010). For example, increased negative affect in married couples' conflict discussions was not associated with divorce years later, but the *combination* of increased negative affect and decreased positive affect did predict later divorce (Carrere and Gottman, 1999). However, the existing literature does not clearly indicate how positive and negative affect interact to drive the impressions patients and physicians form of each other. Prior work examining overall expressivity—that is, the extent to which any affect is expressed—in patient-physician interactions suggests that expressing affect in general can be beneficial (Ambady et al., 2002; Griffith et al., 2003). Yet, by combining positive and negative affect into a single construct, this work cannot distinguish whether benefits are driven by high levels of positive affect, negative affect, or a combination of the two. Other work has examined the independent effects of positive and negative affect (Hall et al., 1981; Roter et al., 1987). Hall et al. (1981) found that patients in routine medical visits were more satisfied with their appointments when naïve coders rated the physicians' speech as containing more positive emotion, but also when they rated the physicians' vocal tone as conveying more negative emotion. Roter et al., (2006) speculated that it is the combination of positive and negative affect that is perceived positively in medical settings—perhaps by conveying sincerity, seriousness, and competence. However, an explicit test of this assumption requires examining both the independent *and* interactive effects of positive and negative affective behavior. It is also worth noting that few studies cited here were conducted using samples of primarily Black patients in a realworld medical setting (e.g., Hall et al., 1981). Furthermore, most of this work has examined the effects of physicians' emotional behavior on patients' impressions, with comparatively little focus on how patients' affective behavior influences physicians' impressions. The current work provides an important test of the generalizability of results obtained using standardized or primarily White patient populations, and extends existing work to include physicians' impressions of patients.

1.2. Affective communication and race-related attitudes

Patients and physicians enter clinic visits already holding attitudes and beliefs that can impact their impressions and decisions. For example, Black patients' mistrust of the healthcare system is related to confidence in treatment recommendations (Penner et al., 2017), engagement in genetic counseling (Sheppard et al., 2013), and quality of life (Kinlock et al., 2017). Physicians' biases and stereotypes can guide their impressions and treatment recommendations (Penner et al., 2014; van Ryn et al., 2006). Research in non-clinical settings suggests race-related attitudes and beliefs, such as bias, can manifest in affective behavior (Richeson and Shelton, 2005), suggesting affective behavior may be a mechanism through which race-related attitudes influence post-visit impressions. Yet, other

work suggests affective behavior may provide individualizing information that contributes to post-visit impressions independently of preexisting attitudes (Kunda and Thagard, 1996; Senft et al., 2016). Existing literature has not examined relationships between race-related attitudes and affective behavior in clinical settings.

1.3. Current research

In the current study, we build upon existing research by examining how positive affect, negative affect, and the interaction between these influence both patients' and physicians' perceptions of one another and the treatment under discussion. Past research demonstrates the expression of positive affect is associated with perceptions of likability, trustworthiness, and intelligence. Therefore, we hypothesized that when physicians expressed high levels of positive affect, patients would perceive them more positively; and when patients expressed higher levels of positive affect, physicians would perceive them more positively. Second, we expected the expression of negative affect would lead to more positive perceptions, but only when expressed along with positive affect. In other words, we expected the co-occurrence of positive and negative affect to elicit more positive impressions and expectations among oncologists and patients. Specifically, our first hypothesis was that higher levels of oncologist positive affect would yield more positive patient perceptions of (1) oncologist patient-centeredness, (2) trust in the oncologist, and (3) confidence in recommended treatments; and oncologist perceptions of (1) patient cognitive ability (2) likelihood of treatment adherence, and (3) likelihood of treatment tolerance. Our second hypothesis was that positive and negative affect would interact to influence patient and oncologist impressions, such that higher levels of negative affect would positively influence each of these impressions, but only when it was accompanied by high levels of positive affect.

As noted earlier, we know that patients' and oncologists' preexisting race-related attitudes and beliefs influence the outcomes of these interactions, yet we know relatively little about the processes whereby this occurs. We considered two possibilities: affective behavior may mediate relationships between race-related attitudes and post-visit perceptions, or it may provide individualizing information that contributes to post-visit impressions independently of preexisting attitudes.

2. Method

2.1. Participants and setting

Data were from a larger parent study testing the effects of a communication intervention in the outpatient clinics of two urban cancer hospitals in Detroit, Michigan (Egely et al., 2017). Institutional Review Boards at Wayne State University and participating hospitals approved all procedures for the parent study, and no additional review was required for this secondary analysis. Data were collected between March 2012 and December 2014. Participants in the parent study were Black patients and their medical oncologists, meeting for the first time to discuss treatment options for breast, lung, or colorectal cancer. In total, 137 patients consented to participate in the parent study and be video recorded during a clinic visit with their oncologist. Of these, 37 patients were excluded because they or their oncologist did not consent to have their data used in secondary analyses. An additional 22 lacked video

recordings for analyses due to technical or logistical problems. Finally, four patients were excluded due to missing data. Thus, participants in the current study included 74 patients and 15 oncologists (see Table 1 for sociodemographic characteristics).

2.2. Parent study procedure

For the parent study, about two weeks before they were scheduled to meet to discuss patient's treatment options, patients and oncologists met with research staff to provide consent and complete baseline surveys which included measures of demographic characteristics and race-related attitudes. Patients diagnosed with a Stage 1 cancer or greater were randomly assigned to either receive a Question Prompt List in the form of a booklet designed to encourage patients' active participation in the visit with the oncologist, to receive the booklet along with personalized coaching from a trained research staff member, or to receive care as usual (i.e., no booklet or other supplementary materials). Fifteen additional patients diagnosed with Stage 0 cancer (DCIS) were not included in the randomization, and received care as usual. Clinic visits were video recorded. Immediately following the visit, patients and oncologists each completed a survey assessing perceptions of each other and their visit. One week later, patients completed a follow-up telephone interview measuring trust in their oncologist and perceptions of the intervention (for further details regarding procedures and intervention, see Eggly et al., 2017).

2.3. Affect coding for current study

For the current study, affective behavior was coded using "thin slice" methodology (Ambady and Rosenthal, 1992). We created five 1-minute segments by dividing each visit into five equal segments and extracting the first minute of each segment, including audio. Sixteen coders (7 Black and 9 White), naïve to the study hypotheses, rated each slice on variables related to affective behavior. Coders were trained to rate slices based on overall impressions, rather than the presence or absence of specific behaviors or expressions, as past work has demonstrated both the accuracy and reliability of quickly-formed impressions of affective states (Henry and Eggly, 2013; Ambady and Rosenthal, 1992).

Coders assessed patient affect and oncologist affect in separate passes, counterbalanced across coders. Half of the coders first focused on patients as they watched each slice, then watched each slice a second time focusing on oncologists. Slices were presented in random order. Items assessing physician and patient affect were adapted from the global affect rating section of the Roter Interaction Analysis System (Roter and Larson, 2002). As described in Henry and Eggly (2013), these items were specifically selected for the context of patient-physician interactions, and were validly rated using thin-slice methodology in the context of patient-physician interactions. This rating system includes three items associated with positive affect that were rated for both patients and oncologists (i.e., warmth, cheerfulness, and attentiveness). Three items associated with negative affect were also rated for both patients and oncologists (i.e., tense, upset, disagreeable). Unique items related to negative affect were also rated for patients (i.e., sadness) and oncologists (i.e., hesitant, hurried). In total, coders rated 15 items related to patients' and oncologists' affect in each of the five thin slices.

2.4. Measures

Affective behavior.—Affect ratings for each interaction were reliable across coders (ICC (2, 16) = .62 to .89) and slices ($\alpha = .75$ to .91). Therefore, ratings were averaged across coders and slices to create a single value for each of the 15 affect items in each video. We averaged ratings of warmth, cheerfulness, and attentiveness to create measures of patient positive affect ($\alpha = .93$) and oncologist positive affect ($\alpha = .93$). To create a measure of patients' negative affect, we averaged ratings of tense, upset, disagreeable, and sad ($\alpha = .84$). Oncologists' hurriedness was not strongly correlated with the other negative affect items, so it was excluded from analyses. We created a measure of oncologists' negative affect using the remaining four items—tense, upset, disagreeable, and hesitant ($\alpha = .82$). Items were rated on a 7-point scale (1 = Very low, 7 = Very high).

2.4.1. Patient perceptions

Patient-centeredness. The 14-item Patient Perception of Patient-Centeredness Scale (PPPC; Stewart et al., 2000) measured patients' perceptions of the quality of their oncologists' communication (e.g., "To what extent did the doctor ask about your goals for treatment?"; $\alpha = .81$). Items were rated on a 4-point scale (1 = Not at all, 4 = Completely).

Trust. Patients completed a 5-item measure of trust in their oncologist during the follow-up interview (Dugan et al., 2005; e.g., "This doctor was totally honest in telling me about all of the different treatment options available for my condition"). Items were rated on a five-point scale (1 = Strongly disagree, 5 = Strongly agree; $\alpha = .78$).

Treatment confidence. A single item assessed patient confidence in the oncologist's treatment recommendation ("How sure or unsure are you that this treatment is the best treatment for your cancer?"). This item was rated on a 6-point scale (1 = Extremely unsure, 6 = Extremely sure).

2.4.2. Oncologist perceptions

Patient cognitive ability. Oncologists' perceptions of patients' cognitive ability were assessed using four items, adapted from van Ryn and Burke (2000; e.g., "The patient is intelligent", "The patient understood the treatment options"; $\alpha = .86$). These were rated on 5-point scales (1 = Strongly disagree, 5 = Strongly agree).

Treatment adherence. Two items were combined to assess oncologists' perceptions that patients would adhere to the recommended treatment ("The patient is likely to follow the medical advice given" and "The patient is likely to follow treatment regimen"; $\alpha = .95$). These were rated on a 5-point scale (1 = Strongly disagree, 5 = Strongly agree).

Treatment tolerance. A single item, rated on a 5-point scale (1 = Strongly disagree, 5 = Strongly agree) assessed oncologists' perceptions of how well the patient would tolerate the treatment regimen ("The patient is likely to tolerate the treatment regimen"; Penner et al., 2016a).

2.4.3. Race-related attitudes and beliefs

Patient perceived past discrimination.: Patients indicated whether they had experienced discrimination in each of five domains: employment (2 items), law enforcement (1 item), education (1 item), housing (2 items), and medical care (1 item). Items were adapted from Brown (2001). Past work has found this scale to have a zero-inflated Poisson (ZIP) distribution, with many respondents reporting no discrimination (Penner et al., 2016b). Therefore, we created two separate measures using this scale—one reflecting the *occurrence* of past discrimination (some vs. none) and the other reflecting the *frequency* of past discrimination (i.e., for those reporting some discrimination, the number of domains in which it was experienced).

Patient healthcare suspicion.: Five items from the suspicion subscale of the Group-Based Medical Mistrust Scale (Thompson et al., 2004) assessed patients' concerns that Black patients would experience mistreatment from the healthcare system (e.g., "Black or African-American people should be suspicious of modern medicine"; $\alpha = .91$). Items were rated on a 5-point scale (1 = Strongly disagree, 5 = Strongly agree).

Patient general trust in physicians.: The 5-item Trust in the Medical Profession Scale (Dugan et al., 2005) assessed patients' beliefs that physicians are, in general, trustworthy (e.g., "All in all, I trust doctors completely"; $\alpha = .86$). Items were rated on a 5-point scale (1 = Strongly disagree, 5 = Strongly agree).

Physician implicit bias.: Physicians' implicit racial bias was measured using the Implicit Association Test (Greenwald et al., 1998). This test provides a difference score representing the degree to which the physician holds an implicit pro-white/anti-Black racial bias.

2.5. Data analysis

All continuous variables were standardized to facilitate interpretation of results. To account for patients nested within physicians, hypotheses regarding the influence of affective behavior on post-visit perceptions were tested using multilevel models using Stata, with oncologist entered as a level-2 variable. Three separate models tested the effects of oncologist affect on patients' (1) perceptions of patient centeredness, (2) trust in the oncologist, and (3) confidence in the recommended treatment options. Oncologist positive affect, negative affect, and their interaction were entered as predictors. Three additional models tested the effects of patient affect on oncologist perceptions of patients' (1) cognitive ability, (2) likelihood of adhering to treatment recommendations, and (3) likelihood of tolerating recommended treatment. Patient positive affect, negative affect, and their interaction were entered as predictors. Race-related attitudes and beliefs were entered as covariates if zero-order correlations showed significant relationships with post-visit perceptions. These are identified for each regression analysis described below. All analyses included study arm as a covariate to control for effects of the parent study intervention on patient and physician impressions. Study arm was not expected to influence affective behavior, and one-way ANOVA's confirmed there were no significant differences in patient or physician affective behavior across study arms (all p 's > .05).

Post-hoc power analyses with G*Power showed that power to detect a medium effect size ranged from approximately 44% for patients' confidence in the recommended treatment to 69% for physicians' perceptions of patients' likelihoods of treatment adherence and treatment tolerance, after accounting for differences across models in the number of covariates included and the total sample.

To account for the relatedness between patient and oncologist affective behavior, we ran alternative versions of all models that controlled for the affective behavior of the other person. In other words, patient affective behavior was included as a control variable in models predicting patient perceptions from oncologist affective behavior, and oncologist affective behavior was included as a control in models predicting oncologist perceptions from patient affective behavior. Including these controls did not alter the results from those of the more parsimonious models described above, so the more parsimonious models are reported.

To assess the possibility that affective behavior might mediate relationships between race-related attitudes and post-visit perceptions, we tested whether any of these attitudes were associated with patient or physician affective behavior. Because there were no significant associations, no mediational models were tested.

3. Results

3.1. Descriptive statistics

Means, standard deviations and correlations among study variables can be found in Tables 2 and 3. Both patients and oncologists expressed more positive than negative affect, $t(73) = 22.67$ for patients; and $t(73) = 62.66$ for oncologists, $ps < .001$. Positive and negative affective behavior were also strongly negatively correlated for both patients and physicians, such that the more positive affect was expressed, the less negative affect was expressed ($r = -.84$ for patients, $r = -.56$ for oncologists, $ps < .001$). Furthermore, physician and patient positive and negative affective behavior were correlated with each other ($rs |.33$ to $.45|$, $ps < .01$). Zero-order correlations between affective behavior and post-visit perceptions are not discussed because, as noted, patients are nested within physicians.

3.2. Relationships between affective behavior and post-visit perceptions

3.2.1. Patient perceptions

Patient-centeredness. Healthcare suspicion was negatively associated with perceived patient-centeredness ($r = -.26$, $p = .03$), and therefore was included as a covariate in this analysis. Controlling for healthcare suspicion, patients' perceptions of oncologist patient-centeredness were not significantly influenced by oncologists' expression of positive affect ($\beta = .06$), negative affect ($\beta = -.22$), or their interaction ($\beta = .20$, all $ps > .05$, all 95% CI's include 0).

Trust. Generalized trust in physicians was associated with post-visit trust ($r = .40$, $p = .001$), and therefore was included as a covariate in this model. Controlling for generalized trust, patients' trust in their oncologist was not significantly influenced by oncologists'

expression of positive affect ($\beta = .07$), negative affect ($\beta = .07$), or their interaction ($\beta = .23$, all p 's $> .05$, all 95% CI's include 0).

Treatment confidence.: Treatment confidence was associated with generalized trust in physicians ($r = .28$, $p = .04$), and healthcare suspicion ($r = -.36$, $p = .01$), and these were therefore included as additional covariates in this model. With these attitudes controlled, a main effect of oncologist positive affect emerged ($\beta = .44$, $p = .03$, 95% CI [.05, .83], $f^2 = .11$), such that the more positive affect the oncologist expressed, the more confident patients were in the treatment recommendation. There was no significant main effect of oncologist negative affect ($\beta = .25$, $p = .21$), but a significant interaction between positive and negative affect qualified the main effect of positive affect in predicting patients' treatment confidence ($\beta = .40$, $p = .03$, 95% CI [.03, .77], $f^2 = .09$). As shown in Fig. 1, when oncologists expressed lower levels of positive affect, their expression of negative affect had little effect on patients' confidence in the recommended treatment. Yet, when oncologists expressed higher levels of positive affect, higher levels of negative affect were associated with patients' increased confidence in the recommended treatment.

3.2.2. Oncologist perceptions

Patient cognitive ability.: Race-related attitudes were not associated with perceptions of cognitive ability, and therefore were not included as covariates in this model. However, patient education level, a somewhat more objective indicator of patient cognitive ability, was included as an additional covariate in this model. Controlling for patients' education, a main effect of patient positive affect ($\beta = .37$, $p = .03$, 95% CI [.04, .70], $f^2 = .10$) indicated that the more positive affect patients expressed, the more the oncologist perceived them as having greater cognitive ability. There was no significant main effect of patient negative affect ($\beta = .23$, $p = .17$, 95% CI includes 0), though the main effect of positive affect was qualified by a significant interaction between patient positive and negative affect ($\beta = .27$, $p < .001$; 95% CI [.13, .40], $f^2 = .53$). As shown in Fig. 2a, when patients expressed lower levels of positive affect, their expression of negative affect had little effect on oncologists' perceptions of cognitive ability. However, when patients expressed higher levels of positive affect, higher levels of negative affect were associated with more positive perceptions. Thus, as hypothesized, patients were viewed most positively when they expressed higher levels of both positive and negative affect.

Expected adherence.: Race-related attitudes were not associated with expected adherence, and were not included as covariates in this model. A main effect of positive affect ($\beta = .50$, $p = .01$; 95% CI [.11, .88], $f^2 = .14$) revealed that the more patients expressed positive affect, the more oncologists expected they would adhere to treatment recommendations. There was no main effect of negative affect ($\beta = .24$, $p = .23$, 95% CI includes 0); however, a significant interaction between patient positive and negative affect again qualified the main effect of positive affect ($\beta = .20$, $p = .02$, 95% CI [.04, .36], $f^2 = .07$). As with perceptions of patients' cognitive ability, and consistent with hypotheses, when patients expressed lower levels of positive affect, their expression of negative affect had no effect on oncologists' perceptions. In contrast, when patients expressed higher levels of positive affect, higher levels of negative affect were associated with more positive perceptions. Thus, patients were perceived as most

likely to adhere to recommended treatments when they expressed higher levels of both positive and negative affect. (see Fig. 2b).

Expected treatment tolerance.: Race-related attitudes were not associated with expected treatment tolerance, and therefore were not included as covariates in this model. A main effect of patient positive affect ($\beta = .43$, $p = .04$, 95% CI [.03, .82], $r^2 = .09$) indicated that oncologists perceived patients expressing higher levels of positive affect as more likely to tolerate the treatment. There was no significant effect of patient negative affect in predicting expected treatment tolerance ($\beta = .22$, $p = .29$, 95% CI includes 0), nor was there a significant interaction between positive and negative affect ($\beta = .17$, $p = .98$, 95% CI includes 0).

4. Discussion

Findings from this study of oncology clinic visits between Black patients and oncologists demonstrate that affective behaviors influence clinically relevant perceptions, after controlling for pre-visit race-related attitudes and beliefs. We hypothesized that: (1) positive affective behavior would be associated with more positive post-visit impressions and (2) negative affective behavior would also be associated with more positive impressions, but only when accompanied by relatively high levels of positive affective behavior. In regards to Black patients' perceptions of their oncologists, we found only partial support for these hypotheses. We found no associations between oncologist positive or negative affective behavior and patient perceptions of patient-centeredness or trust in the oncologist. This finding suggests that affective behavior may not be a strong signal for these characteristics in this clinical setting. Possibly, other aspects of patient-physician communication, such as the specific topics discussed, more strongly influence these perceptions in patients. However, as hypothesized, Black patients had more confidence in treatment recommendations when oncologists expressed higher levels of positive affect. Also as hypothesized, the expression of negative affect increased patients' confidence in recommended treatments, but only when oncologists also expressed higher levels of positive affect. Perhaps in this particular patient-physician context, in which patients tend to harbor higher levels of mistrust, the combination of positive and negative affective behavior signals to patients that the oncologist is genuine, honest, and is treating their illness with sufficient seriousness.

Regarding physician impressions, data largely supported our hypotheses. As expected, Black patients expressing higher levels of positive affect were perceived to be higher in cognitive ability and more likely to adhere to and tolerate recommended treatments. In addition, as expected, patients who expressed higher levels of both positive and negative affect were perceived to be higher in cognitive ability and more likely to adhere to treatment recommendations. However, only positive affect significantly predicted physicians' expectations about treatment tolerance. It is possible that the qualifying effects of negative affect are constrained to perceptions of more psychological or behavioral outcomes, while treatment tolerance may be a more biological outcome.

Finally, we found no evidence that Black patients' race-related attitudes or their oncologists' implicit bias predicted affective behavior during clinic visits—though these attitudes were,

consistent with past work, significantly associated with the impressions patients and physicians formed of each other. Affective behavior and race-related attitudes each influence post-visit perceptions, but they may do so through independent pathways rather than through a mediating effect of race-related attitudes on affective behavior. It is possible that our research lacked sufficient variation in race-related attitudes to detect relationships that truly exist. Oncologists in the sample held fairly low levels of implicit bias, and patients held fairly low levels of mistrust and perceived low levels of past discrimination. These low means may be unique to our sample: physicians in our sample have elected to work in a city with a majority Black population; patients with high levels of mistrust and perceived discrimination may not have consented to participate in the study. However, it is worth noting that race-related attitudes did predict post-visit impressions in the current analyses, and that past work with the same patient and physician populations has found consistent relationships between race-related attitudes and post-visit impressions as well as other behaviors during interactions (Penner et al., 2016a,b, 2017). If the lack of relationship between race-related attitudes and affective behavior is replicated in future work, it may be that these attitudes influence impressions through other kinds of nonverbal behavior. More work must be done to examine other features of communication that may explain the relationships between preexisting attitudes and the impressions patients and physicians form of each other.

Taken together, results suggest that, at least in this context, expressing positive emotion on its own has some benefits, and expressing negative affect along with positive affect yields the most positive impressions in some important domains. It is possible that, as others have suggested (i.e., Hall et al., 1981; Roter et al., 2006), physician expression of negative affect coupled with positive affect sends a message to patients that the doctor is serious, honest, genuine, and appropriately concerned—messages that may be especially important for physicians to convey in interactions with Black patients, who may enter interactions with misgivings about their physicians. Findings from this study suggest this may be true, and that patients' expression of positive and negative affect sends a similar message to physicians. It is worth noting that, consistent with past work, the absolute levels of negative affective expression were relatively low throughout the sample, and that especially among oncologists, there was little variation in the expression of negative affect. This pattern suggests that patients picked up on small differences in their oncologist's negative affect, and even these small differences produced meaningful effects on patient perceptions.

Based on the correlational nature of these data, we cannot draw firm conclusions about the causal relationship between the expression of affect and post-visit impressions. Thus a recommendation that Black patients or their physicians adapt their behavior based on these results seems premature. However, findings from this study provide some preliminary evidence that it may not be necessary or even advisable for physicians to try to conceal their feelings from Black patients. Instead, this research suggests there may be a benefit to physicians' expressing even negative affect (at least, feelings such as anxiety examined in the current study), as long as it is expressed in a frame of compassionate care, warmth, and attentiveness. More work is clearly needed to understand specific negative behaviors and factors such as intensity of affect that drive interpretations of negative affect. Physicians should also acknowledge the potential for their impressions of Black patients to be swayed

by patients' affective behavior. Awareness of the reasons for such impressions may elicit greater attention to ensuring that Black patients are receiving the most effective treatment options.

4.1. Limitations and future directions

This study was intended to provide insight into the associations between affective behavior and post-visit impressions in the specific context of oncology clinic visits between Black patients and their oncologists. Focusing on these kinds of understudied interactions is an important contribution to existing literature, given that both psychological and medical literature have been criticized for lacking racial/ ethnic diversity in their study samples (Henrich et al., 2010; Oh et al., 2015). However, this focus also limits our ability to make statements about the generalizability of the results of the current study to other patient populations or medical contexts (e.g., primary care). As the majority of patients in the current research were female, future research would benefit from examining whether the current findings hold among Black men or other underserved patient groups (e.g., Latino/a patients or patients in rural settings). Additionally, the current sample of 15 physicians did not allow us to systematically test whether physician personal or professional characteristics impacted relationships, though this is an important subject for future work.

Next, while thin-slice coding based on raters' impressions has been shown to predict underlying states reliably and validly, the use of this coding system does not allow us to make more granular assertions about specific behaviors associated with the expressions of positive or negative affect. In future work, it may be important to identify more specific behaviors associated with positive and negative affective behavior. This may be most effectively accomplished through a qualitative investigation of the affective content of patients' and physicians' verbal and nonverbal behavior during interactions. For example, a conversation analysis to identify patterns of affective behavior within the interaction would provide meaningful insight into how positive and negative behaviors influence and interact with each other to guide impression formation.

Another limitation is that after accounting for missing data and additional covariates, many of our statistical analyses were underpowered. This may have resulted in an inability to detect actual relationships between affective behavior and patient perceptions of physicians' patient centeredness and trustworthiness. Relatedly, we were unable to investigate several key indicators of effective communication that may influence outcomes due to an insufficient number of responses in the sample. Finally, future research should aim to incorporate longer-term assessments of Black patients' actual treatment decisions, treatment adherence and tolerance, and health outcomes because this will help understand the clinical relevance of communication during Black patients' clinic visits.

5. Conclusions

Affective behavior is a significant factor guiding impression formation during clinic visits where impressions are undoubtedly consequential. The current study takes us one step closer to understanding the influence of cancer communication on treatment and other outcomes among Black cancer patients. We found that positive affective behavior is associated with

more positive impressions in clinic visits between Black patients and their oncologists. We also found that the combination of positive and negative affective behavior is associated with the most positive post-visit impressions for both patients and oncologists in some domains. These findings were consistent with predictions based on theory and prior research, suggesting results of past work generalize to this applied context, and that results are likely to be replicated in other contexts. The potential for affective behavior to encourage more positive impressions is especially important given that encounters between Black patients and physicians tend to be characterized by poor communication and more negative post-visit perceptions. Building upon and leveraging the relationships between affective behavior and perceptions in clinic visits between Black patients and their physicians is one potential means of moving towards reducing racial healthcare disparities and providing high-quality care across all patients.

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Fig. 1.
Effects of oncologist affective behavior on patients' confidence in treatment recommendations.

a.

b.

Fig. 2.
Effects of patient affective behavior on oncologists' perceptions of patients' cognitive ability (2a) and likelihood of adhering to treatment recommendations (2b).

Table 1

Demographic characteristics of the sample.

	Patients	Oncologists
Mean Age (<i>SD</i>)	58.22 (10.54)	47.28 (10.79)
Sex		
Male	5 (7%)	8 (53%)
Female	69 (93%)	7 (47%)
Ethnicity		
Black/African American	74 (100%)	-
White/Caucasian	-	7 (47%)
Asian/Pacific Islander	-	8 (53%)
Education		
< High School	17 (23%)	-
High school	9 (12%)	-
Some college	27 (37%)	-
College	12 (16%)	-
Post-graduate	9 (12%)	-
Income		
< \$20,000	31 (42%)	-
\$20,000–39,999	21 (28%)	-
\$40,000–59,999	7 (10%)	-
\$60,000–79,999	5 (7%)	-
> \$80,000	5 (7%)	-
Diagnosis		
Breast	64 (87%)	-
Lung	4 (5%)	-
Colorectal	6 (8%)	-

Table 2

Descriptive statistics for key study variables.

		<i>N</i>	<i>Mean</i>	<i>SD</i>
Patient Affect	Positive Affect (7-pt)	74	4.41	0.53
	Negative affect (7-pt)	74	2.05	0.41
Physician Affect	Positive Affect (7-pt)	74	5.05	0.37
	Negative affect (7-pt)	74	1.30	0.19
Patient Perceptions	Patient Centeredness (4-pt)	73	3.68	0.35
	Trust (5-pt)	62	4.13	0.58
	Treatment Confidence (6-pt)	54	4.65	1.05
Physician Perceptions	Cognitive Ability (5-pt)	74	3.98	0.66
	Expected Adherence (5-pt)	74	4.30	0.65
	Expected Tolerance (5-pt)	73	3.93	0.59
Race-based Attitudes	Past Discrimination (Occurrence, N, % None)	74	28 (38%)	-
	Past Discrimination (Frequency, 7-pt)	46	2.41	1.78
	Generalized Physician Trust (5-pt)	71	3.61	0.79
	Healthcare Suspicion (5-pt)	70	1.75	0.80
	Oncologist Implicit Bias	73	0.30	0.29

Table 3

Correlations among key study variables.

	1	2	3	4	5	6	7
1. Pt Positive Affect	-						
2. Pt Negative affect	-0.84***	-					
3. Oncologist Positive Affect	0.45***	-0.34**	-				
4. Oncologist Negative Affect	-0.43***	0.30***	-0.56***	-			
5. Patient Centeredness	0.13	-0.14	0.14	-0.37***	-		
6. Trust	0.20	-0.11	0.00	-0.07	0.15	-	
7. Treatment Confidence	0.19	-0.17	0.19	-0.22	0.39**	0.25	-
8. Cognitive Ability	0.26*	-0.19	-0.05	-0.04	0.07	0.12	0.13
9. Expected Adherence	0.34***	-0.27*	0.03	-0.03	-0.04	0.20	0.17
10. Expected Tolerance	0.23	-0.18	0.04	0.03	-0.06	-0.05	-0.03
11. Past Discrimination (Occ)	0.19	-0.17	0.09	0.06	-0.06	-0.21	-0.20
12. Past Discrimination (Freq)	0.09	-0.01	-0.04	-0.10	-0.10	0.14	-0.19
13. Generalized Physician Trust	0.12	-0.15	0.20	-0.13	0.16	0.40***	0.28*
14. Healthcare Suspicion	-0.02	0.14	0.00	0.05	-0.26*	-0.25	-0.36**
15. Oncologist Implicit Bias	0.15	-0.15	0.01	-0.01	-0.06	0.14	0.09
8. Cognitive Ability	-						
9. Expected Adherence	0.55***	-					
10. Expected Tolerance	0.46***	0.36**	-				
11. Past Discrimination (Occ)	0.08	0.14	0.00	-			
12. Past Discrimination (Freq)	0.12	0.10	-0.01	-	-		
13. Generalized Physician Trust	-0.02	0.14	0.18	-0.28*	-0.31*	-	
14. Healthcare Suspicion	-0.22	-0.07	-0.06	0.14	0.12	-0.39***	-
15. Oncologist Implicit Bias	0.19	0.21	-0.04	-0.11	-0.10	0.02	0.01

*
p < .05,
**
p < .01,

.100) > d

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