Patients Respond More Positively to Physicians Who Focus on Their Ideal Affect

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Previous findings suggest that patients choose physicians whose affective focus matches how they ideally want to feel (Sims et al., 2014). For instance, the more people wanted to feel excitement, the more likely they were to hypothetically choose a new physician who promoted excitement. What remains unknown is whether this match shapes how patients *actually* respond to physicians after being assigned to them (i.e., whether they adhere to physicians' recommendations more and evaluate physicians more positively). To this end, community adults reported their global ideal affect and actual affect (how they ideally want to feel and actually feel during a typical week, respectively), and were randomly assigned to receive health recommendations from either a physician who expressed and promoted high arousal positive states (HAP) (e.g., excitement), or one who expressed and promoted low arousal positive states (LAP) (e.g., calm). For the next 5 days, participants reported their daily adherence to the recommendations and their daily ideal and actual affect. At the end of the week, participants evaluated their physician. As predicted, the more participants wanted to feel HAP, the more they adhered to the "HAP-focused" physician's recommendations, and the more participants wanted to feel LAP, the more they adhered to the "LAP-focused" physician's recommendations. Participants also evaluated their physician more positively when his affective focus matched their ideal affect. Neither global nor daily actual affect systematically predicted how patients responded to their physicians. These findings suggest that patients respond better to physicians whose affective focus matches their ideal affect.

Keywords: ideal affect, adherence, patient-physician communication, health

In the United States, getting patients to follow their doctor's advice and ensuring that they trust their doctor are major challenges to improving health care quality and health outcomes. On average, ~40% of American patients have trouble following their physicians' recommendations (Martin, Williams, Haskard, & DiMatteo, 2005). Moreover, although the majority of patients report that their physicians provide adequate care, patients vary consid-

erably in how positively they respond to their physicians (e.g., Gao, McCullough, Agarwal, & Jha, 2012; Hall, Blanch-Hartigan, & Roter, 2011; National Healthcare Quality & Disparities Reports, 2014). Multiple factors are associated with better health care experiences including physician characteristics (e.g., whether physicians have received training in communication skills; Haskard Zolnierek & DiMatteo, 2009) and patient characteristics (e.g., how conscientious patients are; Hill & Roberts, 2011). As we review below, a growing literature suggests that physicians' and patients' *affective* characteristics (i.e., their affective states, traits, and expressions) are especially critical for optimal health care. Much less is known, however, about how physicians' affective characteristics *interact* with patients' affective characteristics to influence patients' health care experiences. In the current study, we examined whether the effect of physicians' affective focus (i.e., whether they express and promote excited vs. calm states) on patients' responses to their physicians varied as a function of whether patients ideally wanted to feel excitement versus calm states. We focused on two responses that are critical to health: (a) patients' adherence to physicians' recommendations, and (b) patients' evaluation of physicians. Based on affect valuation theory, we predicted that when a physician's affective focus matches his or her patient's ideal affect, the patient is more likely to adhere to the physician's recommendations and to evaluate that physician positively (e.g., as more trustworthy).

The Effect of Physician Affect on Patient Response

Physicians play a key role in shaping their patients' engagement in health-related behaviors; however, some physicians are more

effective than others. In the United States, physicians who show more positive affect seem to be more effective with their patients than those who show less positive affect (for reviews, see Beck, Daughtridge, & Sloane, 2002; Blasi, Harkness, Ernst, Georgiou, & Kleijnen, 2001; DiMatteo, 1979; Levine & Ambady, 2013; Roter, Frankel, Hall, & Sluyter, 2006). For instance, patients report greater satisfaction, are more likely to keep follow-up appointments, and show better physical and cognitive outcomes after discharge when interacting with health care providers who express more positive affect (e.g., Ambady, Koo, Rosenthal, & Winograd, 2002; Cousin, Schmid Mast, Roter, & Hall, 2012; Griffith, Wilson, Langer, & Haist, 2003; Hall, Roter, & Rand, 1981; Schmid Mast, Hall, & Roter, 2008). Even when interacting with a virtual physician avatar, undergraduates made more emotional statements and were quicker to respond when the physician avatar communicated in a caring manner (e.g., made empathetic, reassuring statements) than when the physician avatar did not (Schmid Mast et al., 2008). These findings suggest that patients' perceptions of their clinical encounters and their actual engagement in health-promoting behavior depend in part on physicians' affective focus.

The Effect of Patient Affect on Patient Response

Patients who experience more positive feelings in general are more likely to engage in health-promoting behaviors, such as adhering to their physician's recommendations (cf. Ong, 2010; cf. Pressman & Cohen, 2005). One meta-analysis revealed that the less depressed people were (or the more positive affect they experienced), the more they adhered to nonpsychiatric treatments (DiMatteo, Lepper, & Croghan, 2000). Additionally, positive dispositional characteristics, like optimism, have been associated with health-related risk perception and health promoting behaviors (see Carver, Scheier, & Segerstrom, 2010, for review). For example, the more optimistic people were, the more likely they were to perform skin cancer self-examinations (Luo & Isaacowitz, 2007).

Patients' positive feelings during clinical encounters have also been associated with how patients respond to their physicians. For instance, patients' positive feelings toward their pediatricians predicted subsequent satisfaction, cooperation, and perceived quality of care (Locke, 1996). Patients expressing more satisfaction and less anxiety during their appointments (based on recordings of their speech during clinical encounters) were more likely to return for their follow-up appointments (Hall et al., 1981). Similarly, the more patients joked and laughed with their physicians during their appointments, the more they reported understanding their physicians, and the more confident patients were that they could manage their own health (Pawlikowska, Zhang, Griffiths, van Dalen, & van der Vleuten, 2012).

However, does the effect of patients' positive affective characteristics vary as a function of physicians' positive affective characteristics? Although much less research has addressed this question, findings do suggest that patients adhere more to health recommendations that are presented in ways that match their motivational characteristics and goals (Aaker & Lee, 2001; Ledford, 2012; Lee & Aaker, 2004; Mann, Sherman, & Updegraff, 2004; Notthoff & Carstensen, 2014; Rothman, Bartels, Wlaschin, & Salovey, 2006 for review; Sherman, Mann, & Updegraff, 2006; Latimer et al., 2008; Zhao & Pechmann, 2007). For instance, patients who prefer that their doctors take charge were more

satisfied with a dominant virtual physician avatar than were patients who did not have such a preference (Cousin et al., 2012). In the present study, we test the hypothesis that patients are more likely to adhere to a physicians' health recommendations when that physician's affective focus is consistent with patients' ideal affect. Although previous work has suggested that health recommendations presented in a positive manner may elicit more positive feelings, and that these positive feelings facilitate adherence (Agrawal, Menon, & Aaker, 2007; Hall et al., 1981; Locke, 1996; Pawlikowska et al., 2012; Rothman & Salovey, 1997; Shen & Dillard, 2007), no studies have considered whether these relationships depend on the degree to which people *want* to feel different types of positive states (e.g., excitement vs. calm).

Interactions Between Physician and Patient Affect: Contributions From Affect Valuation Theory

Affect valuation theory (AVT; Tsai, Knutson, & Fung, 2006; Tsai, 2007) distinguishes the states people ideally want to feel ("ideal affect") from the states they actually feel ("actual affect"). Whereas actual affect is a feeling in response to an outcome, ideal affect is a feeling that people consciously or unconsciously strive to achieve. In this way, ideal affect and actual affect serve different functions: actual affect represents how someone is feeling ("I feel good"), whereas ideal affect provides a way of interpreting and evaluating that state ("Am I feeling how I want to feel?" or "Does this feel right?"). Indeed, across a variety of studies, reports of actual affect and ideal affect are only moderately correlated (Sims, Tsai, Jiang, et al., 2014; Tsai, 2007; Tsai et al., 2006; Tsai, Louie, Chen, & Uchida, 2007; Tsai, Miao, & Seppala, 2007; Tsai, Miao, Seppala, Fung, & Yeung, 2007), and structural equation modeling has revealed that actual affect and ideal affect are distinct constructs (Koopmann-Holm & Tsai, 2014; Tsai et al., 2006).

Across cultures, most people ideally want to feel positive more than negative, but people vary between and within cultures in the specific types of positive affect that they ideally want to feel (Barrett, 1996; Chow & Berenbaum, 2012; Kämpfe & Mitte, 2009; Koopmann-Holm, Sze, Ochs, & Tsai, 2013; Ruby, Falk, Heine, Villa, & Silberstein, 2012; Rusting & Larsen, 1995; Scheibe, English, Tsai, & Carstensen, 2013; Tsai, 2007; Tsai et al., 2006; Tsai, Louie, et al., 2007; Tsai, Miao, & Seppala, 2007; Tsai, Miao, Seppala, et al., 2007; Tsai, Sims, Jiang, Thomas, & Fung, 2014; Västfjäll, Gärling, & Kleiner, 2001). For instance, although some people want to feel excitement and other high arousal positive (HAP) states more, others want to feel calm and other low arousal positive (LAP) states more. Although not the main focus of the present article, AVT predicts that cultural factors shape people's ideal affect more than their actual affect, whereas temperamental factors shape people's actual affect more than their ideal affect, and several studies have supported this prediction (e.g., Tsai, Knutson, & Fung, 2006).

Finally, AVT predicts that people's ideal affect drives much of their behavior (Tsai, 2007). In the current study, we were interested in examining whether ideal affect shapes behavior in health care contexts. In particular, we examined whether people's ideal affect predicts their adherence to physicians' recommendations and their evaluations of physicians after receiving those recommendations. We focused on these two outcomes because previous research suggests that both are commonly assessed and reliable

indicators of health care quality, and both exert independent effects on health and health care utilization (Jerant, Fenton, Bertakis, & Franks, 2014; Manary, Boulding, Staelin, & Glickman, 2013).

Adherence to Physicians' Recommendations

As mentioned above, AVT predicts that because people strive to achieve their ideal affective states, they often make decisions based on how they want to feel, consciously or not. Indeed, people's ideal affect predicts people's vacation preferences, leisure activities, and music choices (Mogilner, Aaker, & Kamvar, 2012; Tsai, 2007; Tsai, Louie, et al., 2007; Tsai, Miao, et al., 2007; for review, see Tsai, Chim, & Sims, in press). People also prefer consumer products that are not directly mood producing but that are marketed as eliciting a specific affective state (e.g., "energizing" vs. "calming" lotions). For instance, in one study, participants were randomly assigned to value either excited or calm states (Tsai, Chim, & Sims, in press). When presented with pairs of different consumer products (e.g., relaxing vs. energizing deodorant, chewing gum, and lotions), regardless of how they actually felt, participants in the value excitement condition selected more exciting (vs. calm) consumer products than did participants in the value calm condition.

These studies, however, have primarily focused on recreational or leisure choices. In the present study, we predicted that patients' ideal affect would also influence how likely patients were to adhere to a physician's recommended health behaviors that are in line with their ideal affect. On a conscious level, patients might gauge how likely it is that the recommended behaviors will make them feel how they want to feel. On an unconscious level, patients might attend more to a physician's claims about the benefits of a health-promoting behavior and feel more motivated to try the behavior if presented in a way that matches patients' ideal affect.

Evaluations of Physicians

Ideal affect also shapes how people perceive others. People often make inferences about others' traits or abilities based on their affective expressions (e.g., Rule, Krendl, Ivcevic, & Ambady, 2013; Todorov, Pakrashi, & Oosterhof, 2009; for review, see Zebrowitz & Montepare, 2008). We propose that when evaluating a target person, people consciously or unconsciously evaluate how well that target person's affective display matches their ideal. The more the affective display matches their ideal, the more positive of an impression people have of that target person. At an unconscious level, people may just like or "feel good" about the target person. At a conscious level, people may infer positive traits about the person. In support of this prediction, the more college students valued excitement states, the friendlier they rated targets who displayed excited (vs. calm) smiles. Conversely, the more students valued calm states, the friendlier they rated targets who displayed calm (vs. excited) smiles (Tsai, Chim, Park, Blevins, & Fung, 2014). At the cultural level, countries that value excitement states were more likely to have leaders who showed excited smiles in their official photos, and countries that valued calm states were more likely to have leaders who showed calm smiles in their official photos (Tsai, Ang, et al., 2014).

Do similar processes occur in health care settings? In a recent study, we presented participants with a hypothetical scenario in which they were asked to imagine that their current physician was no longer available, and they needed to select a new physician. Participants evaluated and chose among physicians described as promoting HAP states, LAP states, or neither (Sims, Tsai, Koopmann-Holm, et al., 2014). The more participants wanted to feel HAP over the course of a typical week, the more likely they were to choose a HAP-focused physician. Similarly, the more participants wanted to feel LAP over the course of a typical week, the more likely they were to choose a LAP-focused physician. Participants also evaluated physicians whose affective expressions matched their ideals as more trustworthy, which in turn predicted their choice of physician. Notably, participants' actual trait-like experience of HAP and LAP did not predict physician choice or ratings of trustworthiness. Thus, patients' ideal affect played a greater role than their actual affect when patients were deciding which physician to choose.

However, this study was limited in several ways. First, we used *hypothetical* scenarios. Thus, it remains unclear whether these findings generalize to patients' actual responses to physicians in real life. Second, because participants viewed physicians once and did not have the opportunity to interact with them, it is unclear whether patients' ideal affect continues to predict how patients respond to physicians after multiple contacts in which they are receiving some form of care. Third, participants were able to choose their preferred physician and therefore, it is unclear whether a similar process occurs when patients are assigned a physician. Fourth, the previous study was based on college students; thus, it is unclear whether these processes generalize to community adults.

The Present Study

To address gaps in our previous work and gaps in the larger literature, we recruited a community sample of adults, assessed their global ideal and actual affect (i.e., how they want to feel and actually feel in a typical week), and presented them with health recommendations from either a HAP-focused or LAP-focused physician online. For the following 5 days, we then assessed participants' daily adherence to those recommendations as well as participants' daily ideal and actual affect (i.e., how they wanted to feel and actually felt on a given day). Measuring ideal affect at both the global and daily levels allowed us to examine whether ideal affect would account for between as well as within person variation in adherence. At the end of the 5 days, participants also evaluated their physicians in terms of trustworthiness, competence, and knowledgeability.

Hypotheses

In terms of adherence, we predicted that: (1) the more patients valued HAP (ideal HAP), the more they would adhere to the HAP-focused physician's recommendations, and the more patients valued LAP (ideal LAP), the more they would adhere to the LAP-focused physician's recommendations, (2) ideal affect would predict adherence more than actual affect, and (3) ideal affect would predict both between-person and within-person variation in adherence.

In terms of patients' evaluation of physicians, we predicted that (4) the more patients valued HAP, the more positively they would

evaluate the HAP-focused physician, and the more patients valued LAP, the more positively they would evaluate the LAP-focused physician, and (5) ideal affect would predict evaluations of the physician more than actual affect.

Method

Participants

A sample of community adults was recruited from the San Francisco Bay Area to "help evaluate a virtual health center pilot program." Participants were recruited via newspaper advertisements, Craig's list, and flyers distributed at public locations (e.g., libraries, grocery stores) and were required to live in the San Francisco Bay Area and have access to a computer with Internet access. To minimize risk to participants, we screened them for any major health limitations that would prevent them from adhering to the recommended behaviors, as well as psychiatric distress, and cognitive impairment. There were 48 participants who expressed interest but were excluded for the following reasons: (a) failure to meet ethnic and age criteria ($n = 33$, see below), (b) major health limitations ($n = 5$; 2 had diabetes, 1 had kidney disease, 1 had a degenerative disk issue, and 1 had a leg injury), (c) lack of Internet access ($n = 1$), or (d) residence outside of the San Francisco Bay Area ($n = 8$). One participant was excluded because of he or she attempted to take the study multiple times. No participants were excluded because of psychiatric distress or cognitive difficulties. The final sample consisted of 101 adults (age $M = 56$ years, $SD =$

12 years; Range $= 27$–87 years; 66% female; 34% male). Participants were compensated with a $30 gift card.

For the purpose of another study, participants were matched in terms of age and ethnicity (50 European Americans, 51 Asian Americans). Although the effects of age and ethnicity were not the main focus of the current article, we included both variables as potential covariates and moderators of our findings in all analyses.

Procedure

Participants were asked to "evaluate and provide feedback on a pilot test of a virtual health center." Participants were randomly assigned to view either a physician emphasizing HAP states ("HAP-focused physician" condition, $n = 50$) or a physician emphasizing LAP states ("LAP-focused physician" condition, $n = 51$). Figure 1 illustrates the study procedures, which were approved by the Stanford University Institutional Review Board.

Each participant was scheduled for *two* phone sessions during which a research assistant guided them through portions of the virtual health center Web site to: (a) ensure that participants viewed the information provided on the Web site for similar amounts of time and in the same order, and (b) to provide support in case participants experienced any technical difficulties with the Web site.

During the *first* phone session, research assistants introduced participants to the "Virtual Bay Health Center" Web site, and then asked participants to complete the general health assessment on the Web site, which included measures of health status, typical en-
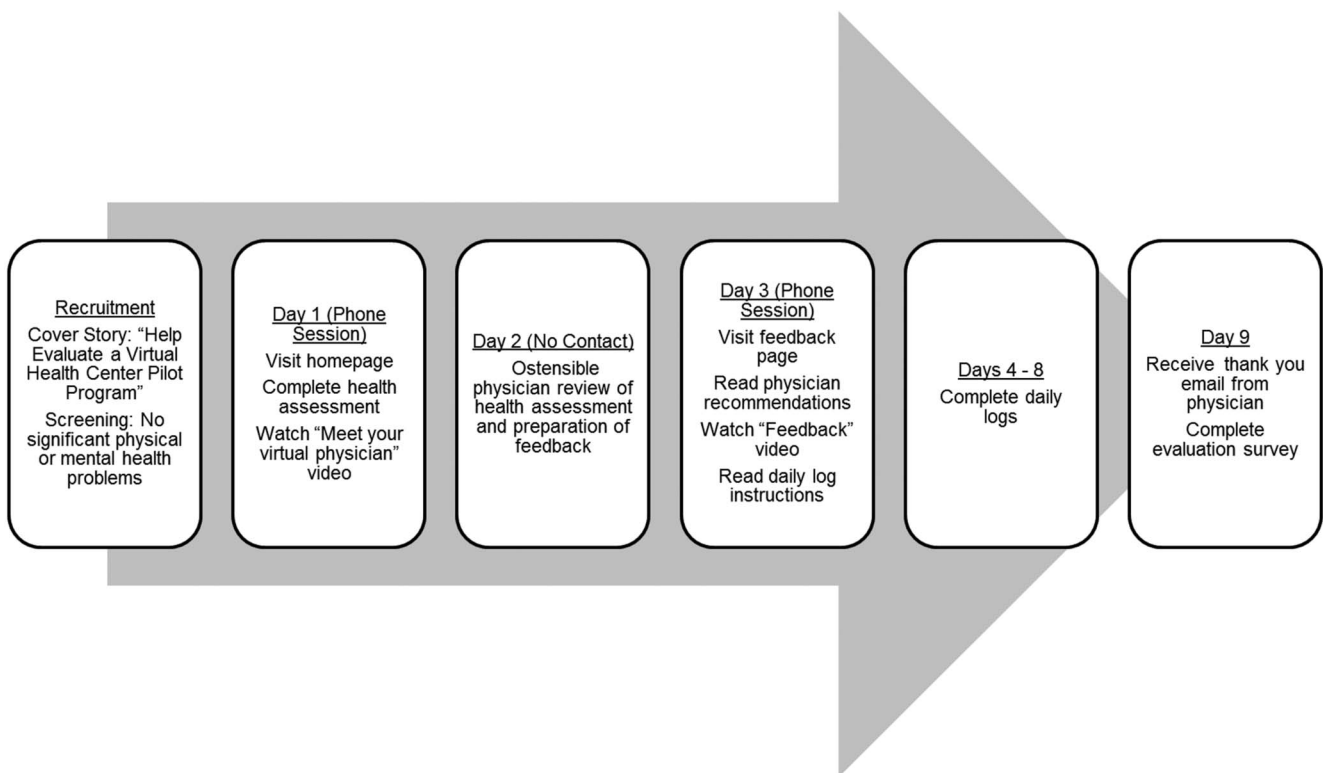

Figure 1. Study procedure.

gagement in health-promoting behaviors, and affect. To allow participants to focus on the assessment, research assistants hung up after providing instructions, but asked participants to call them if they had any questions. After completing the assessment, participants called the research assistant back; research assistants then helped participants navigate through the "Meet Your Virtual Physician" Web page (see Figure 2), where they viewed an introductory video presented by their assigned physician. Afterward, participants evaluated the Web site and were scheduled for a second phone session.

Two days later, research assistants emailed participants a link to the "Feedback" Web page of the Virtual Bay Health Center and provided them with an ostensibly personalized login ID and password. Research assistants then called participants for the *second* phone session to help participants navigate through the Feedback page. On the Feedback page, participants read their health assessment results. All participants received a rating of "Good," on a scale ranging from "Poor" to "Excellent," to standardize what participants saw and so that participants were motivated to follow the physician's recommendations. Underneath their health rating, all participants were shown the same *six* recommendations (described below) to follow over the next 5 days. Research assistants instructed participants to view the video on the Feedback page during which the physician described the benefits of his health recommendations.

For the next 5 days, participants were asked to report whether or not they engaged in each of the recommended behaviors using a daily log, which they accessed via a link on the Feedback Web page. Because some of the recommendations involved behaviors in the evening (e.g., brisk walk after dinner) or before going to sleep (i.e., abstain from eating before bedtime), participants completed their daily logs in the morning about their behaviors during the previous day. At that time, participants also reported their ideal and actual affect for the previous day.

The day after participants completed their final daily log, they received a thank you email from their virtual physician with his photograph and a link to one last survey about their experience with the virtual health center. Thus, by the end of the week, participants had three contacts with the assigned physician (introduction, feedback/recommendations, and thank you). Participants also had the opportunity to provide feedback or comments throughout the study, of which 93% did.[1] Finally, all participants were provided with a written debriefing statement which disclosed the actual purpose of the study, and which explicitly stated that there was no virtual health center being piloted.

Virtual Physician Videos

Introductory video (Day 1). A 90-s introductory video of a "physician" expressing his views on patient care appeared on the Meet Your Virtual Physician Web page. Paid actors portrayed the physicians. Participants saw either the HAP-focused physician, who displayed a wide, toothy smile, and spoke in an enthusiastic manner, or the LAP-focused physician, who displayed a closed-mouth smile, and spoke in a soothing manner. The videos were pretested to ensure that the physicians were similar in terms of likability, but that the HAP-focused physician conveyed more enthusiasm than calm compared with the LAP-focused physician (videos and pretest data available upon request). As in previous

work, descriptions of physicians' medical training, views on patient care, and outside interests were also provided (Sims, Tsai, Koopmann-Holm, et al., 2014). HAP- and LAP-focused physicians were comparable in terms of medical training, but varied in terms of how HAP and LAP their views of patient care and outside interests were (e.g., whereas the HAP-focused physician wanted to increase patients' "overall vitality," the LAP-focused physician wanted patients to lead a "calm and tranquil lifestyle"; see Appendix A).

Because previous research suggests that patients prefer physicians of their same ethnicity (e.g., LaVeist & Nuru-Jeter, 2002), we recruited one European American actor and one Asian American actor to portray the HAP- and LAP-focused physicians so that we could match participants and physicians by ethnicity.

Feedback video (Day 3). A 30-s video of each physician describing the benefits of following his recommendations appeared on the Feedback Web page. To maintain consistency with the physicians' views on patient care, the HAP-focused physician told participants that following his recommendations would help them look and feel "energized," whereas the LAP-focused physician told participants that following his recommendations would help them look and feel "rested."

Physician Recommendations

The physician recommended that above and beyond their usual routine, patients should: (a) do at least 10 min of muscle strengthening activities per day (participants were given a link to a Web page with descriptions of these activities), (b) take a 30 min brisk walk after dinner, (c) nap or rest every afternoon for at least 15–20 min, (d) drink no more than 1 caffeinated beverage per day, (e) drink at least 1 glass of water with every meal, and (f) abstain from eating at least 2 hr before bedtime. These recommendations were based on standard dietary, physical activity and sleep health recommendations made by various American health organizations (i.e., National Sleep Foundation, Mayo Clinic, and U.S. Department of Health and Human Services). We also selected these behaviors because they could be construed as producing HAP or LAP (i.e., people could take a walk to feel energized or rested). At the bottom of the Feedback Web page, participants were told explicitly that the "information and materials presented on the Virtual Bay Health Center Web site, such as text, graphics, and other material" should not be considered a substitute for professional medical advice.

Instruments

Health. As part of participants' initial health assessment, we administered the SF-36v2 health questionnaire (Ware, Kosinski, Dewey, & Gandek, 2000). We calculated physical and mental health composite scores standardized against population norms ranging from 0 to 100 with a mean of 50 and *SD* of 10. Internal

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[1] None of the participants questioned the purpose of providing feedback on the virtual health center. When we explicitly asked at the end of the study whether they thought the study was about anything else, two participants expressed doubt about the validity of the virtual health center; however, excluding these participants from data analysis did not alter the results.
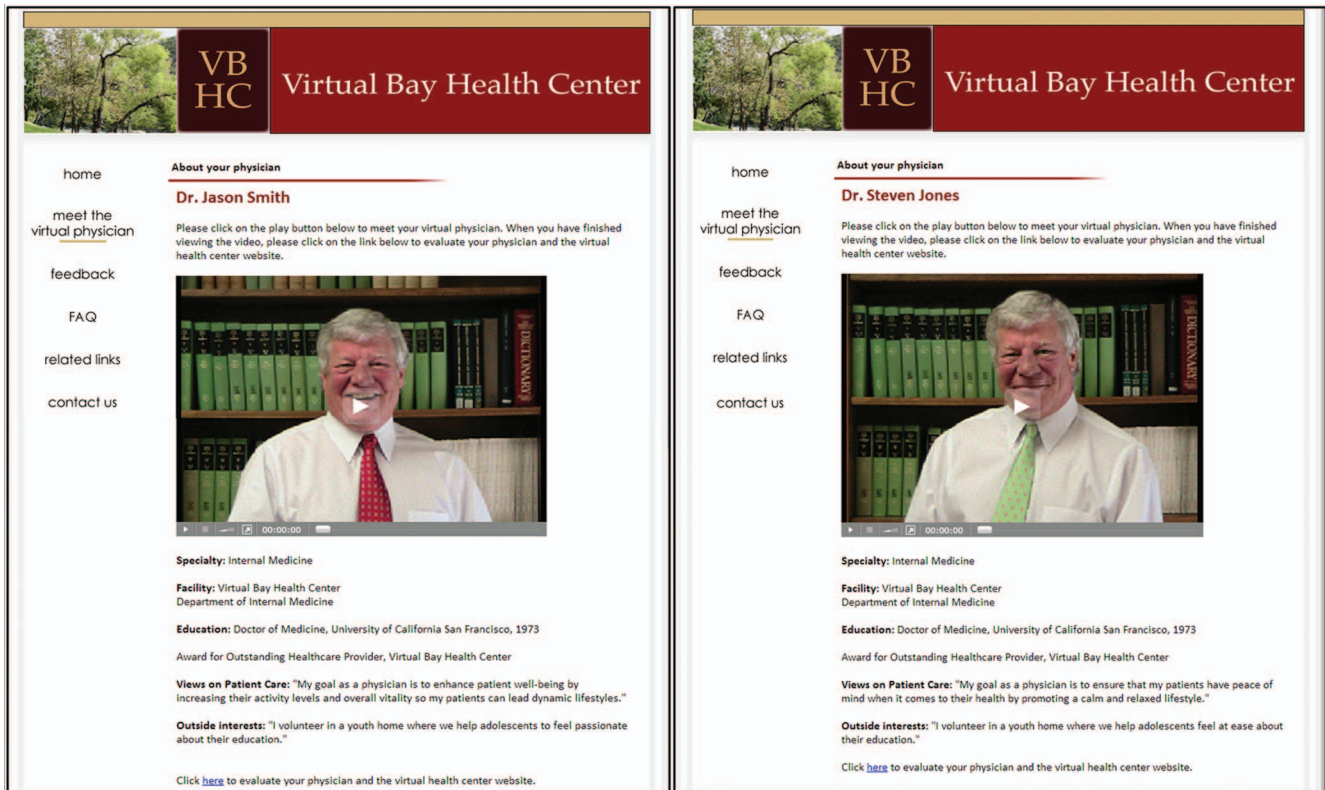
Figure 2. Screenshot of the "Meet the Virtual Physician" Web page on the "Virtual Bay Health Center" Web site. Participants were randomly assigned to either a physician promoting high arousal positive (HAP) states (left) or a physician promoting low arousal positive (LAP) states (right). Photo is reprinted with permission of actor. See the online article for the color version of this figure.

consistencies were high for the physical ($\alpha = .82$) and mental ($\alpha = .86$) health subscales. The subscales were not significantly correlated with each other ($r = -.14$), which is consistent with normative samples (Ware et al., 2000). Mean physical health ($M = 51.71$, $SD = 8.75$) and mental health ($M = 49.40$, $SD = 10.80$) ratings for the current sample were comparable with national averages. Participants also reported whether or not they regularly engaged in several health behaviors, including those recommended in the current study (e.g., walking, napping), with the exception of typical water consumption. On average, participants engaged in two of five of the recommended behaviors before the study ($SD = 0.89$). When we treated participants' regular engagement in the recommended health behaviors as a covariate in our analyses, the results did not change, and therefore, we do not discuss this variable further.[2]

Ideal and actual affect. During the health assessment at the beginning of the week, we assessed *global reports of ideal and actual affect* (e.g., how often do you actually feel/ideally want to feel < affective state > in a typical week?). To maintain consistency with the daily measure (see below), we used two of the four HAP and two of the four LAP terms from the Affect Valuation Index (AVI; Tsai et al., 2006). The HAP aggregate included "excited" and "enthusiastic," and the LAP aggregate included "calm" and "relaxed." Internal consistencies of aggregates were high (ordinal αs = .73 for ideal HAP, .92 for ideal LAP, .86 for actual HAP, and .85 for actual LAP).

We also assessed *daily reports of ideal and actual affect* (e.g., how much did you feel/ideally want to feel < affective state > yesterday?). We used two of the HAP (excited, enthusiastic) and two of the LAP (calm, relaxed) items from the AVI to reduce the number of items that participants had to rate each day. Across the 5 days, test–retest reliability for daily ideal and actual affect was high (ideal HAP $\alpha = .91$, ideal LAP $\alpha = .92$, actual HAP $\alpha = .85$, actual LAP $\alpha = .88$). Within each day, internal consistencies of ideal and actual affect aggregates were also high (ranges of ordinal αs = .79 to .91 for ideal HAP, .88 to .97 for ideal LAP, .77 to .91 for actual HAP, and .88 to .97 for actual LAP). To validate the global reports, we also created *aggregated daily ideal and actual affect* ratings by calculating the means of daily ideal HAP, ideal LAP, actual HAP, and actual LAP across the 5 days and then assessed whether global and aggregated daily reports were correlated.

Adherence to physician recommendations. For 5 days, participants indicated the extent to which they engaged in each behavior (i.e., number of minutes doing muscle strengthening, walking, resting, eating before bedtime; number of caffeinated beverages; and glasses

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[2] Only one participant engaged in all five behaviors at baseline. Because the physician recommended engagement in health behaviors "above and beyond their regular routine," we did not exclude this participant from our analyses.

of water taken with each meal that day). We coded reported adherence as either 0 = *no adherence*, 1 = *some adherence* (i.e., participants attempted to adhere to each behavior but did not meet the exact recommendations), or 2 = *full adherence* (i.e., participants adhered to each behavior at or above recommended levels). For each day, we created a daily adherence score calculated across all of the recommended behaviors; scores ranged from 0 (*no adherence to any recommendation for a given day*) to 12 (*full adherence to all six recommendations for a given day*).

At the end of the week, participants rated how each behavior made them feel in terms of valence (1 = *Very Negative* to 7 = *Very Positive*) and arousal (1 = *Very Inactivated* to 7 = *Very Activated*). Participants reported that all of the behaviors made them feel more positive than negative ($M = 5.52$, $SE = .10$) and more activated than inactivated ($M = 5.13$, $SE = .10$). These ratings did not significantly differ between the HAP and LAP conditions, or by age, gender, ethnicity, or health; and were not associated with ideal or actual affect within conditions, suggesting that the affective qualities of the behaviors were perceived similarly regardless of patients' ideal affect.

Evaluation of physician. At the end of the 5 days, in the final survey, participants were shown the same photo and description of their physician from the beginning of the week. They were then asked to rate how much they *trusted* their physician (1 = *Extremely Trusted* to 7 = *Extremely Distrusted*), how *knowledgeable* their physician was (1 = *Extremely Unknowledgeable* to 7 = *Extremely Knowledgeable*), and how *competent* their physician was (1 = *Extremely Incompetent* to 7 = *Extremely Competent*). We reverse scored trust ratings and aggregated across the three items to create an overall positive evaluation of the physician ($\alpha = .87$).

Data Analyses and Results

Table 1 shows the bivariate correlations, means, and *SE*s for all key variables in the study (means and *SE*s by age group and ethnicity are available upon request). As illustrated in this table, global and daily ratings of ideal affect and of actual affect were moderately correlated, ranging from .47 to .60. Moreover, repeated measures analyses revealed that across conditions, there were no significant differences between global and aggregated daily reports of ideal affect (global vs. aggregated daily ideal HAP: $F(1, 99) = 0.26$, $p = .61$, partial $\eta^2 = .00$; global vs. aggregated daily ideal LAP: $F(1, 99) = 0.45$, $p = .51$, partial $\eta^2 = .00$) or actual affect (global vs. aggregated daily actual HAP: $F(1, 99) = 1.65$, $p = .20$, partial $\eta^2 = .02$; global vs. aggregated daily actual LAP: $F(1, 99) = 1.82$, $p = .18$, partial $\eta^2 = .02$). Findings did not change when controlling for the overlap between actual and ideal affect (i.e., covarying one when examining the other). These findings illustrate that global ratings accurately reflect how participants actually and ideally wanted to feel over the course of the week based on their daily reports.

Before testing our hypotheses, we examined whether there were any differences by condition (HAP-focused vs. LAP-focused physician) in terms of participants' aggregated daily ratings of ideal and actual affect. We conducted a multivariate analysis of variance in which we entered condition as the between-subjects independent variable. There was no significant effect of condition on ratings of daily ideal and actual HAP and LAP, $F(4, 96) = 1.87$, $p = .12$, partial $\eta^2 = .07$. Thus, during the week of the study,

participants who had engaged with the HAP-focused physician were *as likely* to value and experience HAP and LAP states over the course of the 5 days as were those who had engaged with the LAP-focused physician.

Hypotheses 1–3: Does Ideal Affect Predict Self-Reported Adherence to Physician Recommendations?

Because we collected daily reports of adherence, we used hierarchical linear modeling software to test our hypotheses (HLM 7.01; Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011). We ran a series of analyses to build our model. First, at Level 1, we entered daily adherence as the dependent variable. There was significant variation in daily adherence ($\alpha = .89$), $u_o = 3.47$, $SD = 1.86$), $\chi^2(100) = 902.99$, $p < .001$. To determine whether daily adherence differed between the HAP and LAP conditions, we entered condition (LAP-focused physician = -1, HAP-focused physician = 1) at Level 2. If a significant interaction was revealed, we then coded the HAP-focused physician as 0 and the LAP-focused physician as 1 to examine effects within the HAP condition, and coded the HAP-focused physician as 1 and the LAP-focused physician as 0 to examine effects within the LAP condition. The effect of condition on daily adherence was not significant, $B = 0.31$, $SE = .19$, $t(99) = 1.59$, $p = .114$. On average, participants assigned to the HAP-focused physician adhered to his recommendations ($B = 8.28$, $SE = 0.28$) to a similar degree as those assigned to the LAP-focused physician ($B = 7.66$, $SE = 0.27$).

We then entered participants' daily ideal HAP, ideal LAP, actual HAP, and actual LAP (grand-mean centered) as independent variables at Level 1. Because the random effects of daily ideal and actual affect were not significant (see Appendix B), we constrained these effects to be fixed in the final model. At Level 2, we added ethnicity (European American = 0; Asian American = 1), gender (female = 0; male = 1), age, and physical and mental health as covariates (grand-mean centered). When estimating overall adherence, there were marginal effects of physical health, $B = 0.04$, $SE = .03$, $t(94) = 1.71$, $p = .091$, and mental health, $B = 0.03$, $SE = .02$, $t(94) = 1.72$, $p = .089$: healthier participants reported greater adherence across conditions. There was also a significant effect of gender, $B = 0.97$, $SE = .40$, $t(94) = 2.42$, $p = .017$. Across conditions, men were more likely to adhere to physician recommendations ($M = 7.23$, $SE = .26$) than were women ($M = 6.30$, $SE = .20$). There were no significant effects of age, $p = .736$, and ethnicity, $p = .473$, on adherence or on the associations between daily affect (ideal or actual) and daily adherence, and thus, we excluded them from the final model to maintain parsimony (see Appendix B for final model).

Table 2 (top) displays beta coefficients, *SE*s, and t statistics of effects within each condition and differences in effects between conditions. Consistent with Hypothesis 1, analyses revealed a significant effect of condition on the association between daily ideal HAP and daily adherence, $p = .002$, and the association between daily ideal LAP and daily adherence, $p = .024$. The more participants ideally wanted to feel HAP, the more participants reported adhering to the HAP-focused physician's recommendations, $p = .031$. Also as predicted, the more participants ideally wanted to feel LAP, the more they reported adhering to the LAP-focused physician's recommendations, $p = .004$. Daily ideal

Table 1
Bivariate Between-Subjects Correlations Among Key Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Global ideal HAP	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Global ideal LAP	0.36***	1	—	—	—	—	—	—	—	—	—	—	—	—	—
3. Global actual HAP	0.34***	0.15	1	—	—	—	—	—	—	—	—	—	—	—	—
4. Global actual LAP	0.1	0.25*	0.45***	1	—	—	—	—	—	—	—	—	—	—	—
5. Average daily ideal HAP	0.53***	0.23*	0.32**	0.05	1	—	—	—	—	—	—	—	—	—	—
6. Average daily ideal LAP	0.13	0.48***	0.11	0.11	0.40***	1	—	—	—	—	—	—	—	—	—
7. Average daily actual HAP	0.28**	0.05	0.60***	0.22*	0.60***	0.28***	1	—	—	—	—	—	—	—	—
8. Average Daily Actual LAP	0.14	0.17†	0.34***	0.47***	0.23*	0.45***	0.50***	1	—	—	—	—	—	—	—
9. Average daily adherence	0.05	−0.41	0.17†	0.19†	0.08	0.01	0.25*	0.28**	1	—	—	—	—	—	—
10. Positive physician rating	0.79†	0.07	0.16	0.18†	0.20*	0.16	0.25*	0.06	0.20†	1	—	—	—	—	—
11. Gender (female = 1)	0.02	−0.03	−0.04	−0.20†	−0.15	−0.02	−0.16	−0.14	−0.27**	−0.16	1	—	—	—	—
12. Age	−0.02	0.07	−0.03	0.23*	−0.04	0.01	−0.03	0.11	0.02	0.07	−0.23*	1	—	—	—
13. Ethnicity (EA = 0, AA = 1)	0.05	−0.01	0.14	0.21*	−0.04	−0.05	0.10	0.08	0.17	0.22*	−0.06	−0.16	1	—	—
14. Physical health	0.18†	0.21*	0.25*	0.06	0.12	0.09	0.24*	0.14	0.19†	0.01	0.06	−0.26**	0.03	1	—
15. Mental health	0.03	−0.01	0.54***	0.64***	0.01	−0.01	0.36***	0.37***	0.19†	0.08	−0.23*	0.35***	0.13	−0.14	1
Mean (SD)	3.56 (0.75)	4.33 (0.72)	3.08 (0.85)	3.42 (0.75)	3.63 (0.68)	4.03 (0.61)	2.92 (0.70)	3.22 (0.71)	6.63 (1.65)	5.20 (0.96)	0.65 (0.48)	56.38 (11.94)	0.51 (0.50)	51.71 (8.62)	49.40 (10.63)

Note. HAP = high arousal positive affect; LAP = low arousal positive affect; positive physician rating n = 99.
† $p < .10$.   * $p < .05$.   ** $p < .01$.   *** $p < .001$.

Table 2
Unstandardized β Coefficients, SEs and t-Statistics Representing the Magnitude of the Effect of Ideal and Actual Affect and the Interaction Between Patient and Physician Affect on Patients' Adherence to Physicians' Recommendations and Evaluations of Their Physician

	HAP physician		LAP physician		Patient × Physician affect	
	B (SE)	t	B (SE)	t	B (SE)	t
Adherence to physician recommendations						
Ideal HAP	0.53 (.24)	2.16*	−0.54 (.24)	−2.21*	0.53 (.17)	3.11**
Ideal LAP	−0.16 (.26)	−0.60	0.63 (.22)	2.88**	−0.40 (.17)	−2.23*
Actual HAP	−0.29 (.21)	−1.43	0.40 (.19)	2.11*	−0.34 (.14)	−2.53**
Actual LAP	0.39 (.26)	1.49	0.08 (.15)	0.53	0.15 (.15)	1.04
Evaluation of physician						
Ideal HAP	0.77 (.23)	3.39***	−0.25 (.18)	−1.38	0.51 (.15)	3.48***
Ideal LAP	−0.48 (.19)	−2.58**	0.56 (.27)	2.12*	−0.52 (.16)	−3.21**
Actual HAP	−0.18 (.20)	−0.87	0.08 (.18)	0.45	−0.13 (.13)	−0.96
Actual LAP	0.30 (.23)	1.30	0.08 (.20)	0.39	0.11 (.15)	0.74

Note. $df = 383$ for analyses of adherence behavior; $df = 87$ for analyses of evaluations of physicians. HAP = high arousal positive affect; LAP = low arousal positive affect.
* $p \leq .05$.   ** $p \leq .01$.   *** $p \leq .001$.

HAP was significantly negatively associated with adherence to the LAP-focused physician's recommendations, $p = .028$, suggesting that the more people value HAP, the less they adhere to a physician's recommendations when that physician focuses on LAP. Daily ideal LAP, however, was not significantly associated with adherence to the HAP-focused physician's recommendations, $p = .548$. Gender and health did not moderate effects of daily ideal affect on adherence behavior. In summary, consistent with Hypothesis 1, an individual's likelihood of adhering on a given day increased when there was a match between physician's affective focus and participants' daily ideal affect (see Figure 3, top).

To test Hypothesis 2 that ideal affect would predict adherence more systematically than actual affect, we examined the effects of daily actual affect. Analyses revealed a significant effect of condition on the association between daily actual HAP and daily adherence, $p = .012$. Daily actual HAP did not significantly predict adherence to the HAP-focused physician's recommendations, $p = .154$, but did significantly predict adherence to the LAP-focused physician's recommendations, $p = .035$. Moreover, this interaction varied as a function of physical health, $B = 0.03$, $SE = .01$, $t(383) = 2.19$, $p = .029$, and mental health, $B = 0.033$, $SE = .014$, $t(383) = 2.47$, $p = .014$. Post hoc analyses revealed that actual HAP was more positively associated with adherence to the LAP-focused physician only for individuals whose health was above the sample median, $B = 0.66$, $SE = .29$, $t(383) = 2.25$, $p = .025$.

There was not a significant effect of daily actual LAP, $p = .131$, and no significant effect of condition on the association between daily actual LAP and daily adherence, $p = .298$. However, there was a significant effect of physical health on the association between daily actual LAP and daily adherence, $B = -0.03$, $SE = .02$, $t(383) = -2.04$, $p = .042$. A post hoc analysis showed that daily actual LAP was more positively associated with adherence to both physicians, but only for individuals whose physical and mental health was rated lower than the sample median, $B = 0.65$, $SE = .24$, $t(383) = 2.71$, $p = .007$. In summary, although there were some effects of actual affect on adherence, these effects varied as a function of patients' physical and mental health, and

did not systematically vary as a function of the match between patients' ideal affect and physicians' affective focus. These findings provide some support for Hypothesis 2.

To test Hypothesis 3, we also examined a model at the between-person level in which we entered global ideal and actual affect (also grand-mean centered) as Level 2 predictors of mean adherence across the week. We used the same covariates as in the within-person model. We found no significant main effects and no significant interactions with condition for global ideal HAP, global ideal LAP, global actual HAP, and global actual LAP on average adherence.[3] Contrary to our prediction, these findings suggest that at the between person level, neither global ideal affect nor global actual affect predicted how much participants adhered on average to physicians' recommendations.

Hypotheses 4–5: Does Ideal Affect Predict Positive Evaluations of Physicians?

Before testing Hypotheses 4–5, we examined whether participants varied in their evaluations of the HAP- and LAP-focused physicians. Two participants did not respond to the physician evaluation items and therefore were not included in these analyses. An independent samples t test revealed that participants assigned to the HAP-focused physician evaluated their physician as positively ($M = 5.09$, $SE = 0.15$) as did participants assigned to the LAP-focused physician ($M = 5.29$, $SE = 0.14$), $t(97) = -0.99$, $p = .327$. Because we did not measure evaluations of the physician at the daily level,[4] we only examined the links between global ideal and actual affect and evaluation of the physician.

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[3] There were also no significant main effects or interactions involving condition for *aggregated* daily ratings of ideal HAP, ideal LAP, actual HAP, and actual LAP on average adherence across the week.

[4] We did not measure evaluation of physicians at the daily level for two reasons. First, we wanted to keep the daily questionnaire brief to minimize participant fatigue. Second, we were concerned that participants would find rating how they felt about the physician on a daily basis unnatural.
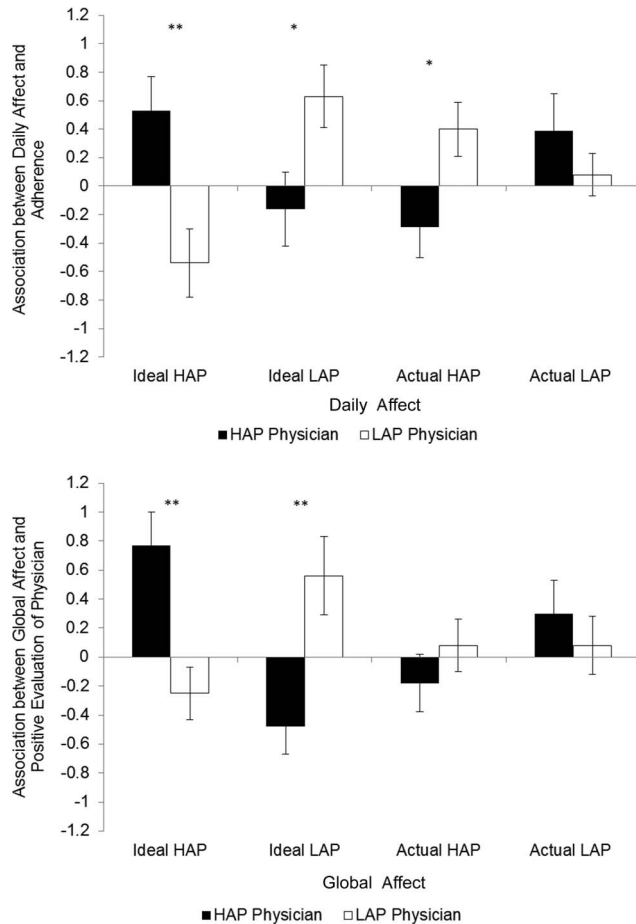
Figure 3. Top: Effect of participants' daily ideal and actual affect on daily adherence to physician recommendations; bars represent mean within-person unstandardized beta coefficients. Bottom: Effect of participants' global ideal and actual affect on positive evaluation of assigned physician at the end of the study; bars represent mean unstandardized β coefficients. *Note.* HAP = high arousal positive affect; LAP = low arousal positive affect. Asterisks indicate differences between conditions, * $p <$ .05. ** $p <$ .01.

To examine the effects of global ideal affect on evaluation of physicians within condition, we conducted moderation analyses using hierarchical regression (Aiken & West, 1991). We entered participants' positive evaluation of the physician as the dependent variable and condition (using the same coding as in the previous analyses), global ideal HAP, global ideal LAP, global actual HAP, and global actual LAP as the independent variables at Step 1. At Step 2, we entered the interactions between condition and global ideal HAP, global ideal LAP, global actual HAP, and global actual LAP. Because participants' adherence to physician's recommendations during the week was marginally correlated with how positively they evaluated the physician, we also controlled for average adherence.

Additionally, we included ethnicity, gender, age, and health as covariates in the model. There was a significant effect of ethnicity such that Asian Americans rated both physicians more favorably ($M = 5.41$, $SE = 0.13$) than did European Americans ($M = 4.97$, $SE = .15$), $B = 0.44$, $SE = .20$, $\beta = .22$, $t(98) = 2.23$, $p = .028$.

As expected, the more participants adhered to physician recommendations, the more positively they evaluated the physician, $B = 0.14$, $SE = .06$, $\beta = .22$, $t(98) = 2.24$, $p = .030$. The remaining covariates, however, did not have an effect on physician evaluation or alter observed results, and therefore, we excluded them from the final model for parsimony.

Table 2 (bottom) contains β coefficients, *SE*s, and *t* statistics of effects within each condition and differences of effects between conditions. In support of Hypothesis 4, the interactions between condition and global ideal HAP, $\beta = .38$, $p = .001$, and between condition and global ideal LAP, $\beta = -.37$, $p = .002$, were significant: the more participants wanted to feel HAP on average, the more they positively they evaluated the HAP-focused physician at the end of the study, $\beta = .58$, $p = .001$. Similarly, the more participants wanted to feel LAP on average, the more positively they evaluated the LAP-focused physician at the end of the study, $\beta = .40$, $p = .037$. Global ideal HAP was not significantly associated with evaluations of the LAP-focused physician, $\beta = -.19$, $p = .172$; however, global ideal LAP was significantly *negatively* associated with evaluations of the HAP-focused physician, $\beta = -.34$, $p = .012$: the more people wanted to feel LAP on average, the less positively they evaluated the HAP-focused physician (see Figure 3, bottom).

In support of Hypothesis 5, the interactions between condition and global actual HAP, $\beta = -.11$, $p = .341$, and between condition and global actual LAP, $\beta = .08$, $p = .463$, were not significant. There were also no significant main effects of global actual HAP, $\beta = -.04$, $p = .715$, or global actual LAP, $\beta = .14$, $p = .214$. Thus, participants' global ideal affect systematically predicted their evaluation of physicians whereas their global actual affect did not.[5] Therefore, participants' ideal affect not only predicts their evaluation and selection of hypothetical physicians after a single contact (as shown in our previous work), but also predicts patients' evaluation of assigned physicians after multiple contacts in real life.

Discussion

Although previous findings suggest that for American samples, physicians' and patients' affective characteristics independently predict patient outcomes, few studies have examined how the two interact. The present study is the first to examine how patients' ideal affect interacts with physicians' affective focus to influence their actual (i.e., non-hypothetical) responses to physicians. As predicted, we observed that patients were more likely to adhere to physicians' recommendations and to evaluate their physicians positively if their physician focused on the type of positive affect that patients valued.[6]

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[5] Findings were similar when we included aggregated daily ideal and actual affect as predictors of evaluation of physician. Model fit statistics were comparable for aggregated daily ideal affect, $F(11, 87) = 2.71$, $p < .01$, $R^2 = .26$, and global ideal affect, $F(11, 87) = 2.90$, $p < .01$, $R^2 = .27$, demonstrating that both aggregated daily and global reports of ideal affect predict participants' evaluation of their physicians to a similar degree.

[6] We performed a multilevel mediation analysis using Mplus and found that patients' evaluation of physician *did not* mediate the link between ideal affect and adherence. This result and the finding that patients' evaluation and adherence ratings were only marginally correlated support previous findings that they are two distinct clinical outcomes.

In some cases, we also observed that patients were less likely to adhere and to evaluate their physicians positively when the physician did not focus on their ideal affective state. However, this pattern was not consistent across outcomes or affective states, and therefore, further research is needed to determine whether "mismatches" result in more negative patient outcomes.

Daily Ideal Affect Predicts Daily Adherence to Physicians' Recommendations

Consistent with our hypotheses, at the daily level, the more participants wanted to feel HAP, the more they adhered to the HAP-focused physician's recommendations. Similarly, the more people wanted to feel LAP, the more they adhered to the LAP-focused physician's recommendations. Daily actual affect did not systematically predict daily adherence to the HAP-focused versus LAP-focused physician. Instead, among the healthier participants, the more they actually felt HAP, the more they adhered to recommendations made by the LAP-focused physician. In contrast, among less healthy participants, the more they actually felt LAP, the more they adhered to recommendations made by either physician. Future work should examine why the effects of actual HAP and LAP vary depending on the health status of the participant. One possibility is that HAP states are too physically stimulating for unhealthy participants, and therefore, do not facilitate engagement in health-promoting behavior for these individuals. In contrast, LAP states may not be physically stimulating enough for healthy American participants, and therefore, may not facilitate engagement in health-promoting behavior for these individuals. Together, these findings suggest that although both daily ideal and actual affect shape adherence behavior, they do so in distinct ways. Whereas the effect of daily ideal affect on health-related behavior and cognitions may depend more on features of the physician, the effect of daily actual affect on health-related behavior and cognitions may depend more on characteristics of the individual (i.e., patients' health status).

In addition, we found that men were more likely to adhere to physicians' recommendations overall. In part, this may be because we used male actors to portray the physicians, and studies suggest that female patients prefer female doctors (e.g., Garcia, Paterniti, Romano, & Kravitz, 2003). Although we did not observe gender differences in ideal affect or the effects of ideal affect on adherence, a promising direction for future research would be to investigate whether patients perceive the affective qualities of physicians differently depending on the physician's gender (cf. Hall et al., 2011).

Whereas participants' daily ideal affect predicted how likely they were to adhere to physicians' recommendations on a given day relative to the rest of their week, contrary to our expectation, participants' global ideal affect did not predict their average adherence. Instead, other factors such as gender and physical health predicted average adherence regardless of the assigned physician. These findings suggest that the links between affect and actual health behavior may be better understood when considering daily variation and processes within an individual (e.g., Hooker, Choun, Mejia, Pham, & Metoyer, 2013).

Future work should explore *how* ideal affect leads to greater adherence. One possibility is that ideal affect enhances how people perceive the health behaviors recommended by the physician. For instance, by recommending engagement in health behaviors to feel their ideal state, physicians may be helping their patients see the efficacy or benefit of those behaviors in their daily lives (cf., Azjen,

2002; Bandura, 2004; Becker, 1974; Carpenter, 2010; McEachan, Conner, Taylor, & Lawton, 2011).

Global Ideal Affect Predicts Positive Evaluations of Physicians

As predicted, at the global level, the more participants valued HAP, the more positively they evaluated the HAP-focused physician at the end of the 5 days. Also as predicted, the more participants valued LAP, the more positively they evaluated the LAP-focused physician at the end of the 5 days. These findings are consistent with Sims et al. (2014), which demonstrated that when asked to imagine that their primary care physician was no longer available, college students more positively evaluated and were more likely to choose physicians whose affective focus matched their ideal affect. In that study, participants did not actually interact with the HAP or LAP-focused physicians, but made their evaluations and choices based on information about how they thought the physician would be (i.e., after a single encounter). The current study expands upon these findings by demonstrating that *community adults* more positively evaluated physicians whose affective focus matched their ideal affect *even after the physician provided feedback and made health recommendations* (i.e., after multiple encounters). In other words, the match between a patient's ideal affect and a physician's affective focus matters not only when patients are selecting a physician (as demonstrated in previous work), but also when they are actually interacting with and responding to an assigned physician (as demonstrated in the present work). In future work, we plan to explore possible mechanisms underlying the link between ideal affect and physician evaluation. For example, one possibility is that patients selectively attend to physicians who promote their ideal affect, which in turns makes them appear more knowledgeable, competent, and trustworthy. Indeed, people are more likely to attend to cues that are congruent with their motivational goals and attitudes (e.g., Forster & Higgins, 2005; Hamamura, Meijer, Heine, Kamaya, & Hori, 2009; Sakaki, Nga, & Mather, 2013; Smith, Fabrigar, Powell, & Estrada, 2007). Another possibility is that patients find it more rewarding (e.g., enjoyable, satisfying) to interact with physicians whose affective focus matches their ideal affect and, as a result, they evaluate those physicians as more trustworthy, knowledgeable and competent. Indeed, patients report feeling more satisfied with physicians whose preferences align with their own (for review see Kiesler & Auerbach, 2006).

Limitations and Future Directions

The current study design had several limitations that should be addressed in future research. First, our findings were based on participants' self-reports of adherence, raising the possibility of experimenter demand. In other words, individuals may have reported greater adherence because they wanted to please the physician who matched their affective ideals. If this were the case, participants would have also reported increased experience or valuation of the affective states promoted by their physician; our data, however, show that participants experienced and valued HAP and LAP states similarly across conditions. Moreover, reports of global ideal and actual affect assessed before viewing the physician did not differ from daily reports assessed after three encounters with the physician ("meeting" the virtual physician, receiving feedback and recommendations from the physician, being thanked by the physician), suggesting that partici-

pants did not change their reports of affect to be more consistent with their assigned physicians. Regardless, future work is needed to assess whether the observed effects generalize to more objective behavioral assessments of adherence.

Second, because of the correlational design of our study, we cannot definitively conclude that how patients ideally want to feel shapes how they respond to physicians. It may be that physicians' affective foci directly influence patient adherence and judgments, which in turn influences their ideal affect. However, the *prospective* design of our study suggests otherwise. That is, patient global ideal affect sampled before viewing the physician predicted patient evaluations of the physician at the end of the 5-day period. Additionally, as described above, global reports of ideal affect assessed before viewing the physician were similar to aggregated daily reports of ideal affect provided after viewing the physician, suggesting that physicians' affective foci did not influence patient ideal affect over the course of the week. However, it would be interesting to examine in future work whether over longer periods of time, repeated exposure to a trusted physician whose affective focus differs from his or her patients' initial ideal affect does indeed change how patients subsequently ideally want to feel.

Third, physicians differed in their "affective focus," which included differences in their facial expressions and vocal tone, their views on patient care, their interests, and the affective outcomes of their health recommendations. We altered multiple characteristics of each physician both to strengthen the effect of our manipulation, as well as to increase ecological validity. In other words, we assumed that a physician in the real world would be consistent in his or her affective focus across these characteristics, and that inconsistencies (e.g., a calm physician promoting feeling energetic) would seem odd to participants. However, more work is needed to examine whether one characteristic is more necessary than the other to shape adherence and evaluation. Indeed, in a previous study, we observed that participants' ideal affect predicted their evaluations of physicians even when they read only about physicians' views on patient care, suggesting that images of the physicians were not necessary to influence patients' evaluations of physicians (Sims, Tsai, Koopmann-Holm, et al., 2014). On the other hand, research has demonstrated that people make significant inferences about people based only on their facial expressions (Rule et al., 2013; Todorov et al., 2009; see Zebrowitz et al., 2008 for review). Future work should examine the incremental impact of each characteristic on patients' responses to their physicians as well as the mechanisms underlying these effects.

Finally, future research should examine whether our findings generalize to other health recommendations and to other samples. To accommodate an age diverse sample, we did not examine more vigorous health recommendations. However, it would be important to include a variety of other health recommendations in future studies. Relatedly, to ensure we did not risk participants' health, we selectively recruited a relatively healthy sample comprised of European Americans and Asian Americans. It would be important to examine whether a match between patients' ideal affect and physicians' affective focus is also relevant among chronically ill populations and among other ethnic groups. Furthermore, because we matched participants and physicians by ethnicity, it would also be important to determine whether similar processes occur in situations when physicians and patients are of different ethnicities.

Implications for Patient-Physician Communication

Despite these limitations, our findings have important implications for the role of affect in the context of health care. Our work demonstrates that patients' and physicians' affective characteristics interact to influence two clinically significant patient outcomes: adherence to health recommendations and evaluations of physicians. Physicians should recognize that their patients have affective ideals that might influence how they respond to physicians. Moreover, physicians could assess their patients' ideal affect and then consider whether there are particular health care providers or treatments that are consistent with patients' ideals. If none exist, physicians might explicitly discuss with patients how their ideal affect might hinder their adherence to particular recommendations and their interactions with particular health care providers. Along these lines, in our current research, we are developing and assessing the effectiveness of interventions aimed at educating clinicians about the importance of ideal affect in health care.

Our findings also have implications for theories of health decision-making and health behavior change. A large body of research has shown that actual affect influences people's health-related decisions and behaviors. Although we found that actual affect played a role in patient behavior in some cases, ideal affect predicted our outcomes more consistently, robustly, and systematically. This work raises the possibility that knowing how someone ideally wants to feel may be as important as knowing how someone actually feels, if not more so in certain contexts. Therefore, current models of affect and health-related behavior and cognition should include how people ideally want to feel. Second, this work has implications for research on health communication and message framing. Using message framing to promote health behaviors was initially born out of prospect theory (Kahneman & Tversky, 1979; Rothman et al., 1997), and focuses on the utility of emphasizing gains (i.e., benefits of engaging in a behavior) versus losses (i.e., costs of not engaging in a behavior) for promoting healthy behavior. Our findings indicate that emphasizing certain gains will be more or less effective depending on what the patient values. Finally, several studies have observed significant cultural and age-related variation in ideal affect (Ruby et al., 2012; Scheibe et al., 2013; Sims, Tsai, Jiang, et al., 2014; Sims, Tsai, Koopmann-Holm et al., 2014; Tsai, 2007; Tsai, Knutson, et al., 2006; Tsai, Miao, et al., 2007; Tsai, Louie, et al., 2007). Thus, considering patients' ideal affect may be useful in communicating health information to diverse populations and ultimately help reduce ethnic disparities in health care utilization across the life span.

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Appendix A

Physician Video Scripts and Descriptions

HAP Physician Video Script

Introduction

"Hi, I'm Dr. Jason Smith (Lee)[*]. I am excited to be assigned as your personal virtual physician. As your physician, my goal is to enhance your well-being by increasing your activity levels and overall vitality so you can lead a more dynamic, energetic lifestyle! I believe that the key to a long, healthy life is to have an enthusiastic attitude and approach each day with passion and zest! Finding exhilaration will lead to good health. Engagement in vigorous, strengthening activities while keeping in high spirits can help you get fit and feeling great! Today, we will begin by giving you a general health assessment. Once I review the results, I will provide you with a health program to follow for the week. Then, we can meet again to review how your week went and determine whether we are meeting your health goals." [*]Name used for Asian American physician.

Feedback

Thank you for completing our health assessment survey. Here are your results and my recommendations. Please bookmark this page, so you can return any time. Based on my review, I have prescribed a personalized health plan for the upcoming week. This plan is intended to be in addition to your regular daily activities over the next 5 days. It consists of aerobic exercise, muscle resistance training, and healthy practices to ensure an upbeat and stimulating lifestyle. Descriptions of the muscle strengthening exercises can be found at the link below. By following this plan as closely as possible, I am confident that you will look and feel energized! I hope you will approach this week with much enthusiasm. I look forward to checking in with you soon.

HAP Physician Written Description

Specialty: Internal Medicine
Facility: Virtual Bay Health Center, Department of Internal Medicine
Education: Doctor of Medicine, University of California San Francisco, 1973, Award for Outstanding Healthcare Provider, Virtual Bay Health Center
Views on patient care: "My goal as a physician is to enhance patient well-being by increasing their activity levels and overall vitality so my patients can lead dynamic lifestyles."
Outside interests: "I volunteer in a youth home where we help adolescents to feel passionate about their education."

LAP Physician Video Script

Introduction

"Hi, I'm Dr. Steven Jones (Wong)[*]. I am pleased to be assigned as your personal virtual physician. As your physician, my goal is to ensure your well-being by promoting peace of mind when it comes to your health so you can live a more calm and tranquil lifestyle. I believe that the key to a long, healthy life is to have a carefree attitude and approach each day cool and collected. Finding serenity will lead to good health. Engagement in soothing, strengthening activities can help you get fit and feel rested. Today, we will begin by giving you a general health assessment. Once I review the results, I will provide you with a health program to follow for the week. Then, we can meet again to review how your week went and determine whether we are meeting your health goals." [*]Name used for Asian American physician.

Feedback

"Thank you for completing our health assessment survey. Here are your results and my recommendations. Please bookmark this page, so you can return any time. Based on my review, I have prescribed a personalized health plan for the upcoming week. This plan is intended to be in addition to your regular daily activities over the next 5 days. It consists of aerobic exercise, muscle resistance training, and healthy practices to ensure a calm and peaceful lifestyle. Descriptions of the muscle strengthening exercises can be found at the link below. By following this plan as closely as possible, I am confident that you will look and feel rested. I hope you can relax as you approach this week. I look forward to checking in with you soon."

LAP Physician Written Description

Specialty: Internal Medicine
Facility: Virtual Bay Health Center, Department of Internal Medicine
Education: Doctor of Medicine, University of California San Francisco, 1973, Award for Outstanding Healthcare Provider, Virtual Bay Health Center
Views on patient care: "My goal as a physician is to ensure that my patients have peace of mind when it comes to their health by promoting a calm and relaxed lifestyle."
Outside interests: "I volunteer in a youth home where we help adolescents feel at ease about their education."

(Appendices continue)

Appendix B

Multilevel Model Equation Estimating Patient Adherence

Multilevel model equation in which participants' daily self-reported adherence was regressed onto daily reports of ideal and actual affect at Level 1 and the effect of condition (physician type), gender, and health included at Level 2 to examine their effects on the within-person association between daily adherence and ideal and actual affect. Random effects of daily and actual affect were not significant and constrained to be fixed in the final model: Daily Ideal HAP: $r_1 = 0.73$, $SD = 0.85$, $\chi^2(34) = 34.62$, $p = .44$; Daily Ideal LAP: $r_3 = 0.53$, $SD = 0.73$, $\chi^2(34) = 45.35$, $p = .09$; Daily Actual HAP: $r_2 = 0.59$, $SD = 0.77$, $\chi^2(34) = 24.53$, $p > .50$; Daily Actual LAP: $r_4 = 0.36$, $SD = 0.60$, $\chi^2(34) = 42.85$, $p = .14$

Level-1 Model

$$Daily\ Adherence_{ij} = \beta_{0j} + \beta_{1j} * (Daily\ Ideal\ HAP_{ij}) + \beta_{2j} * (Daily\ Actual\ HAP_{ij}) + \beta_{3j} * (Daily\ Ideal\ LAP_{ij})$$
$$+ \beta_{4j} * (Daily\ Actual\ LAP_{ij}) + r_{ij}$$

Level-2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01} * (Condition_j) + \gamma_{02} * (Gender_j) + \gamma_{03} * (Physical\ Health_j) + \gamma_{04} * (Mental\ Health_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} * (Condition_j) + \gamma_{12} * (Gender_j) + \gamma_{13} * (Physical\ Health_j) + \gamma_{14} * (Mental\ Health_j)$$

$$\beta_{2j} = \gamma_{20} + \gamma_{21} * (Condition_j) + \gamma_{22} * (Gender_j) + \gamma_{23} * (Physical\ Health_j) + \gamma_{24} * (Mental\ Health_j)$$

$$\beta_{3j} = \gamma_{30} + \gamma_{31} * (Condition_j) + \gamma_{32} * (Gender_j) + \gamma_{33} * (Physical\ Health_j) + \gamma_{34} * (Mental\ Health_j)$$

$$\beta_{4i} = \gamma_{40} + \gamma_{41} * (Condition_j) + \gamma_{42} * (Gender_j) + \gamma_{43} * (Physical\ Health_j) + \gamma_{44} * (Mental\ Health_j)$$

Mixed Model

$$Daily\ Adherence_{ij} = \gamma_{00} + \gamma_{01} * Condition_j + \gamma_{02} * Gender_j + \gamma_{03} * Physical\ Health_j + \gamma_{04} * Mental\ Health_j$$
$$+ \gamma_{10} * Daily\ Ideal\ HAP_{ij} + \gamma_{11} * Condition_j * Daily\ Ideal\ HAP_{ij} + \gamma_{12} * Gender_j * Daily\ Ideal\ HAP_{ij}$$
$$+ \gamma_{13} * Physical\ Health_j * Daily\ Ideal\ HAP_{ij} + \gamma_{14} * Mental\ Health_j * Daily\ Ideal\ HAP_{ij}$$
$$+ \gamma_{20} * Daily\ Actual\ HAP_{ij} + \gamma_{21} * Condition_j * Daily\ Actual\ HAP_{ij} + \gamma_{22} * Gender_j * Daily\ Actual\ HAP_{ij}$$
$$+ \gamma_{23} * Physical\ Health_j * Daily\ Actual\ HAP_{ij} + \gamma_{24} * Mental\ Health_j * Daily\ Actual\ HAP_{ij}$$
$$+ \gamma_{30} * Daily\ Ideal\ LAP_{ij} + \gamma_{31} * Condition_j * Daily\ Ideal\ LAP_{ij} + \gamma_{32} * Gender_j * Daily\ Ideal\ LAP_{ij}$$
$$+ \gamma_{33} * Physical\ Health_j * Daily\ Ideal\ LAP_{ij} + \gamma_{34} * Mental\ Health_j * Daily\ Ideal\ LAP_{ij}$$
$$+ \gamma_{40} * Actual\ Ideal\ LAP_{ij} + \gamma_{41} * Condition_j * Actual\ Ideal\ LAP_{ij} + \gamma_{42} * Gender_j * Actual\ Ideal\ LAP_{ij}$$
$$+ \gamma_{43} * Physical\ Health_j * Actual\ Ideal\ LAP_{ij} + \gamma_{44} * Mental\ Health_j * Actual\ Ideal\ LAP_{ij} + u_{0j} + r_{ij}$$