

Using Non-Fit Messages to De-Intensify Reactions to Threatening Advice

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ABSTRACT

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Sometimes experts need to provide potentially upsetting advice. For example, physicians may recommend hospice for a terminally ill patient because it best meets their needs, but the patient and their family dislike this advised option. The present research examines whether regulatory non-fit could be used to improve these types of situations. The findings from eight studies in which participants imagined receiving upsetting advice from a physician demonstrate that regulatory non-fit between the form of the physician's advice (emphasizing gains vs. avoiding losses) and the participants' motivational orientation (promotion vs. prevention) improves participants' evaluation of an initially disliked option. Regulatory non-fit de-intensifies participants' initial attitudes by making them less confident in their initial judgments and motivating them to think more thoroughly about the arguments presented. Furthermore, consistent with previous research on regulatory fit, the studies show that the mechanism of regulatory non-fit differs as a function of participants' involvement in the evaluation of the option.

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Chapter 1: Introduction

Some professional tasks involve providing advice that can provoke negative reactions from decision makers, which, in turn, can produce irrational attitudes and decisions. Examples of this include consultants who have to recommend changing the course of action to a stubborn senior manager or teachers who have to advise re-taking a course to a poor performing student, but an especially prominent example is physicians advising patients about a threatening medical option. Healthcare providers have to recommend potentially unpleasant but beneficial options, particularly when a disease advances and irreversibly worsens. Recommendations might provoke intense negative feelings in patients who have serious illnesses like advanced cancer. This dissertation explores how to provide advice in the least uncomfortable way to ensure that a decision-maker considers the expert advice rather than simply rejects it.

When a disease advances, patients might face a situation in which their preferred outcome – often it is staying alive – is not supported by clinical evidence and statistics. Furthermore, fear of uncertainty and fear of death might shape patients' preferences against statistical and medical likelihoods. As a result, patients might form strong negative opinions about options that do not involve active cancer treatment such as hospice care or just monitoring early stage cancer. Intense negative attitudes could affect patients' choices, making their decisions misaligned even with their values and their long-term goals. A physician's task is to help patients navigate difficult decisions ensuring that patients' choices match their real preferences and goals. To perform this task effectively, physicians often have to advise patients of options that could sound frightening or unpleasant (e.g. , hospice care), and patients, receiving these recommendations, might reject advice without fully considering them.

To illustrate this decision-making process and advice for hospice, Harrington and Smith (2008) describe the following clinical situation. A 56-year-old businessman was diagnosed with lung cancer and fought it with several lines of chemotherapy. His health deteriorated rapidly due to cancer and toxic treatment. When he was wheelchair-bound in the hospital with pneumonia, physicians approached him and suggested reducing the aggressiveness of toxic interventions and to consider only symptom care instead (e.g. hospice care). The patient refused to follow the physicians' advice and asked for more treatment. He died 14 months after the diagnosis while still undergoing chemotherapy treatment. The patient's primary physician reported in an interview that the patient believed he needed to try more treatment options and said "absolutely no" to discontinuing treatment. However, the patient's actual preferences for his last months of living were never fulfilled. His wife revealed that the patient wanted to spend meaningful time with his children, family, and friends, which he could have achieved by being on palliative support rather than pursuing treatment. In contrast, he was frequently in the hospital, half-conscious, without physical strength to say goodbye to his family. This story illustrates that patients might reject potentially beneficial advice before considering it, and as a result, fail to meet their preferences when their disease advances.

Inefficiency in physician-patient communication, when tough choices have to be made, results in many people not meeting their preferences in their last months of living. While 86% of people reported that they don't want life-prolonging interventions at the end of their lives (Barnato et al., 2007), 44% of dying people spend their last months misaligned with their preferences (Jeurkar et al., 2012). Furthermore, 50.5% of patients receive aggressive interventions at the end-of-life (Wang et al., 2016) that reduce their quality of life without a significant increase in their quantity of life.

Conducting thorough discussions about frightening and unpleasant options is essential to better accommodate patients' preferences at the end of life (Chen et al., 2013; Lin, Levine, & Scanlan, 2012; Quill, Arnold, & Back, 2009; Vig, Starks, & Hopley, 2010; Weeks et al., 2012). Guided by fear and anxiety, patients tend to avoid such conversations or abruptly stop them at their very beginning. When asked, only 23% of patients wanted to discuss their end-of-life care with their primary oncologists (Dow et al., 2010). Therefore, physicians are often expected to initiate and lead the conversations, as well as provide a recommendation for the best possible course of action. However, most physicians experience discomfort advising hospice care. Due to prognostic uncertainty and limited communications training, physicians are often at a loss about what and how to say to patients (Bernacki & Block, 2014). As a result, 88% of cancer patients reported that they have no or very little conversations about hospice (Nelson et al., 2011). To address this gap, I explore behavioral insights aiming to answer the question: *how do physicians recommend to patients a potentially frightening option, one that is among these patients' least preferred choices, but it best meets the patients' long-term goals?* I develop and test a behavioral intervention that helps reduce negative reactions when such an option needs to be recommended. This reduction of negative reactions increases the likelihood that patients will at least consider the recommendation, rather than bluntly reject it. This work will help to improve our understanding of how to approach these conversations with physicians. As a result, physicians and patients will be better prepared to discuss end-of-life care.

To answer my research question, I employ a theory on motivation and propose that demotivation could lead to de-intensifying negative reactions toward a recommended option. In Chapter 2, I give an overview the theory of Regulatory Fit and propose that it is regulatory non-fit that could be helpful when experts need to provide advice for a beneficial but potentially

unpleasant or frightening option. Employing laboratory experiments among online participants and cancer patients in Chapter 3, I show that my proposed approach encourages participants to reduce their negative reactions toward a recommended but disliked option. Furthermore, my experiments reveal boundary conditions of regulatory non-fit approach and its effects on decision-making outcomes (e.g. choices, satisfaction). In Chapter 4, I enhance the generalizability of my findings by demonstrating a similar effect of regulatory non-fit in physician-patient communications about early stage prostate cancer. Patients with newly diagnosed cancer might react negatively toward advice for cancer surveillance instead of cancer treatment. I show that those who did react negatively reduce the intensity of their reactions if the advice is provided in a non-fit manner, supporting the findings in Chapter 3.

This work is unique in several dimensions. First, it develops a connection between theoretical psychology and clinical communications. Contemporary literature in bioethics highlights the importance of applying behavioral theories to medical decisions (Fridman, Epstein, & Higgins, 2015; Reyna, Nelson, Han, & Pignone, 2015; Verma, Razak, & Detsky, 2014). Yet, the applications of behavioral theories to medical decisions often raise ethical concerns due to fear of biasing or paternalistically shifting patients' choices (Ploug & Holm, 2015). As a result, there is little research demonstrating an effective application of behavioral theories in the context of treatment decisions. Because of this, contemporary healthcare professionals, despite having well-developed clinical skills and knowledge in how to approach asking clinical questions, are often at loss regarding how to deliver threatening information and frame unpleasant recommendations to patients in an optimal way (Quill & Holloway, 2012). Therefore, being at the frontier line of the translational research, this dissertation aims to fill the

gap between theory and practice by providing empirical data on how a behavioral theory could enhance clinical communications.

Second, while multiple studies focus on the advantages of increasing motivation in various contexts including healthcare (Ludolph & Schulz, 2015; Motyka et al., 2014; Wallace, Butts, Johnson, Stevens, & Smith, 2013), the advantages of demotivation are often undervalued. The current line of research fills this gap in the theoretical knowledge proposing the circumstances when demotivation could be beneficial. Particularly, the dissertation demonstrates that demotivation helps people to be more open to recommendations and re-evaluate potentially beneficial options that are initially disliked.

Finally, this work advances theoretical knowledge on Regulatory Fit phenomena by focusing on the effects of regulatory *non-fit*. There are only a few studies that explicitly tested effects of regulatory non-fit (Koenig, Cesario, Molden, Kosloff, & Higgins, 2009; Vaughn, Malik, Schwartz, Petkova, & Trudeau, 2006; Vaughn, O'Rourke, et al., 2006). None of them explored attitude change in the context of medical decisions. My work highlights not only previously unknown effects of regulatory non-fit on attitude change but also propose boundary conditions, explores moderators, and as a result reconciles previous inconsistencies in findings on regulatory non-fit.

Chapter 2: Regulatory Non-Fit as an Intervention for Providing Tough Recommendations

In this chapter of the dissertation, I review Regulatory Fit theory and propose theoretical postulates that describe the effects of the complement of regulatory fit – regulatory non-fit.

Regulatory Fit

The principles of Regulatory Fit theory are best illustrated through the motivational orientations and strategies associated with regulatory focus theory. Regulatory focus theory distinguishes between two motivations: promotion and prevention. Promotion-focused people prefer to attain progress, advancing from their current status quo to a better state. In contrast, people with a prevention focus prefer to maintain a satisfactory status quo and ensure against losses. Individuals experience regulatory fit when a promotion-oriented person moves toward his/her desired end-states through eager means (i.e., actively pursuing growth) or when a prevention-oriented person moves toward his/her desired end-states through vigilant means (i.e., being careful to avoid mistakes). Individuals experience regulatory non-fit when a prevention-oriented person moves toward his/her desired end-states through eager means and when a promotion-oriented person moves toward his/her desired end-states through vigilant means.

Multiple experiments and naturalistic studies have demonstrated that the fit between personal goals orientations (promotion vs. prevention) and the manner of a goal pursuit (eagerly achieving gains vs. vigilantly avoiding losses) intensifies participants' evaluations of the targeted option. Regulatory fit increases a persuasiveness of a message (Cesario & Higgins, 2008; Kees, 2011; Lee & Aaker, 2004), strengthens motivation to buy a product (Avnet & Higgins, 2006; Higgins, Idson, Freitas, Spiegel, & Molden, 2003), enhances initial attitudes toward an advocated target (Cesario, Grant, & Higgins, 2004), and increases the likelihood that individuals follow recommendations for healthy behavior (Kees, Burton, & Tangari, 2010; Ludolph & Schulz,

2015; Spiegel, Grant-Pillow, & Higgins, 2004; Zhao & Pechmann, 2007). A recent meta-analysis confirmed the strong effect of regulatory fit across different domains (Motyka et al., 2014). The authors estimate the difference between the effect of regulatory fit and non-fit and reveal that regulatory fit could almost double the effect of the message on motivation compared to the non-fit.

How does regulatory fit works? When individuals experience regulatory fit, they “feel right” about what they are doing (Cesario et al., 2004; Higgins, 2006; Higgins & Scholer, 2009). Feeling right is similar to the feeling of being “suitable” or “correct,” such as the feeling one has when one uses the appropriate clothes for a specific occasion, e.g., school versus skiing (Higgins & Scholer, 2009). Initially, researchers found participants who are experiencing regulatory fit misattribute their “feeling right” toward their evaluations of an option. For instance, Cesario et al. (2004) demonstrated that regulatory fit enhanced participants initial attitudes by making positive attitudes more positive or negative attitudes more negative toward a discussed option.

Other researchers discovered a second mechanism via which regulatory fit influences behavior. Higgins (2006) proposed that if individuals’ experience regulatory fit, they become more engaged, involved, and absorbed in what they are doing. Supporting this proposition, Lee, Keller, and Sternthal (2010), found that participants valued an option more in the regulatory fit versus non-fit condition because they felt more engaged in the process of the evaluation. Other studies have also shown a similar effect of increased engagement in the regulatory fit condition. For instance, participants solved more anagrams (Shah, Higgins, & Friedman, 1998) and exerted more effort while completing a task (Förster, Higgins, & Idson, 1998).

Further research by Avnet, Laufer, and Higgins (2013) proposed that the initial involvement (high vs. low) defines whether participants misattribute their feeling right toward a target or become more engaged and confident in their opinion about the target if they experience regulatory fit. Individuals are involved in their evaluations, if they possess knowledge on a target, they are willing to devote their attention to a new message, and they are motivated to draw inferences about a target based on their previous knowledge and new information (Cacioppo & Petty, 1984). Avnet et al. (2013) stated that, if individuals have low initial involvement, regulatory fit creates the feeling right that is misattributed toward their attitudes, in a manner that is similar to other positive feelings. As a result, the evaluation of an option becomes more positive regardless of the initial attitudes. On the other hand, if individuals have high initial involvement, regulatory fit intensifies their engagement in their evaluations making them more confident in their initial attitudes. In this case, positive attitudes become more positive, while negative attitudes become more negative.

To check this proposition, Avnet, Laufer, and Higgins (2013) manipulate initial involvement. In the high involvement condition, participants were told that an advertisement was scheduled to appear nationwide in the next month and that their input about it would be taken very seriously. In the low involvement condition, participants were informed that the advertisement was just a draft that may or may not publicly appear next year. Participants read a message that negatively advocated an option (caffeine usage). In the low involvement condition, it was found that despite the negative advocacy of the message, participants reported a better attitude toward the discussed option in the regulatory fit condition, than participants in the non-fit condition. This effect illustrates that participants misattributed their positive feeling right from regulatory fit toward their attitudes, making them more positive. However, under the high

involvement condition, participants evaluated the option more negatively in the fit condition compared to the non-fit condition. Consistent with initial predictions, in the fit condition participants became more engaged and, therefore, their attitudes also were enhanced more than participants in the non-fit condition.

The results of this study and the proposed conceptualization of two mechanisms of regulatory fit and initial involvement are generally consistent with the dual processing model (Chaiken, 1980; Petty, Cacioppo, & Schumann, 1983). The model distinguishes between a more peripheral information processing that occurs under the low involvement condition and a more systematic processing of the information that occurs under the high involvement condition. If peripheral information processing is at play, individuals experience the feeling right, a feeling created by regulatory fit, as a decision-making heuristic – positive “gut feeling” toward a target. If systematic processing is at play, individuals become more engaged in their initial evaluations due to regulatory fit.

Effects of regulatory fit are well explored and documented. Yet, in this dissertation, I advance Regulatory Fit theory by focusing on the effects of regulatory non-fit. I demonstrate the previously unknown effects of regulatory non-fit on attitude change as well as how and when regulatory non-fit complements the effects of regulatory fit.

Regulatory non-fit

Individuals experience regulatory non-fit if promotion-focused individuals move toward their goals in a vigilant manner ensuring against losses and mistakes, or if prevention-focused individuals move toward their goals using an eager strategy focused on advancements and growth. If those who experience regulatory fit feel right, those who experience regulatory non-

fit feel “feel wrong.” In this work, I show that “feeling wrong” make individuals doubt their initial attitudes and as a result, make them more open toward changing these attitudes.

Similarly to the regulatory fit influence, the influence of regulatory non-fit should depend on initial involvement. If individuals have a low initial involvement, they should use their feeling wrong as information and misattribute these unpleasant feelings toward a discussed target making their attitude less positive. At the same time, if individuals have high initial involvement, their feeling wrong should reduce their engagement in their initial evaluations. Consequently, a positive evaluation becomes less positive, and, more importantly for this work, a negative evaluation becomes less negative.

Importantly, previous research on regulatory non-fit tends to focus mostly on the mechanism of misattribution. In a series of studies, Vaughn, O’Rourke, et al. (2006) demonstrated that participants’ “feeling wrong,” created by the regulatory non-fit experience, informed their evaluations. Researchers asked half of the participants to what extent they believed that their evaluation is correct. Those who experienced feeling wrong from regulatory non-fit misattributed these feelings toward their evaluations. As a result, they were more open toward correcting their evaluations compared to the participants in the fit condition. In other research, Vaughn, Malik, et al. (2006) asked participants to evaluate whether they did enough to complete a task. In the non-fit condition, participants misattributed their feeling wrong toward their evaluations. As a result, they kept working on the task longer than participants in the fit condition. These results confirm that participants used their feeling wrong, a feeling created by their non-fit experiences, as information answering the questions that researchers asked them.

Furthermore, Koenig, Cesario, Molden, Kosloff, and Higgins (2009) found another noteworthy effect of regulatory non-fit. The researchers documented that participants who were

not initially involvement in a discussed subject were motivated to process a message in the regulatory non-fit condition more thorough than in the fit condition and, as a result, were less likely make erroneous evaluations. Guided by their feeling right in the fit condition, individuals felt good about (satisfied with) a peripheral information processing and reached a quick conclusion basing their evaluations on decision-making heuristics. On the contrary, feeling wrong in non-fit condition motivated participants to stop and invest more cognitive efforts to resolve their feelings of unease. Thus, participants were more likely to base their final evaluations on the arguments in the message rather than on decision-making heuristics. Overall, these studies illustrate that regulatory non-fit influences individual evaluations via transfer of feeling wrong, just as regulatory fit influences individual evaluations via the transferring "feeling right."

Research has also shown that a regulatory non-fit experience could reduce participants' engagement in their initial evaluations. Tam and Spanjol (2012) explored the regulatory fit effect on participants' choices of healthy food and unexpectedly observed a regulatory non-fit effect. They asked participants to collect food receipts and bring them back to the lab. Participants, who initially evaluated the study task as being difficult, were more likely to persist and complete it in the non-fit condition than in the fit condition. The task was relevant to their daily life and, therefore, participants were likely to have a high involvement in it. Those who experienced regulatory non-fit became less engaged and less confident in their initial evaluations that the task was difficult. Thus, they were more likely to complete the task. Even though researchers did not focus on regulatory non-fit effects in their investigation, it seems that this study is an illustration of how a regulatory non-fit can reduce engagement and as a result de-intensifying initially negative evaluations.

In my dissertation, I extend the research on regulatory non-fit. First, I focus on those individuals who have high involvement in their attitudes. I explore the effect of regulatory non-fit on reducing engagement in initial negative attitudes. Unlike previous research that measured attitudes only after the fit/non-fit manipulation, I measure attitudes before and after the manipulation focusing on capturing attitude change. According to the theoretical assumption, those individuals with an initial negative attitude will make it less negative (improve) in the non-fit condition rather than in the regulatory fit condition. Importantly, in this work, I focus on changing negative attitude strength rather than on changing valence of the attitude.

Furthermore, aiming to reconcile previous findings on regulatory non-fit that suggest misattribution of feeling wrong or the reduction of engagement, I will show, in Study 5, that regulatory non-fit could influence individuals behavioral via both of these mechanisms depending on participants' initial involvement.

Chapter 3: Regulatory Non-Fit and Advice for End-of-life Care

Study 1: Attitude toward a Rejected Option

This study demonstrates that the advice given in the regulatory non-fit manner improves evaluation of an option if individuals initially rejected this option. The following hypothesis will be tested:

H1: In the regulatory non-fit condition, participants have a more positive attitude toward a rejected option compared to the participants in the fit condition.

Methods

Participants. Participants were recruited at Mechanical Turk (MTurk) online platform. MTurk is an online labor market in which participants produce psychometrical data (Buhrmester, Kwang, & Gosling, 2011; Paolacci & Chandler, 2014). Participants whose age is more than 50 years old were encouraged to participate in this study. A total of 279 individuals (48% male; average age = 56 years $SD = 11$) completed the online survey for monetary compensation.

Procedure. Upon entering the survey, participants filled in the Regulatory Focus Questionnaire (RFQ) that measured their promotion- and prevention-orientations. They then read a vignette imagining having a terminal cancer with the chance to survive 15 months if they chose chemotherapy or 8.5 months if they chose hospice care. The script was created based on the research on Non-Small-Cell Lung Cancer (Group, 2008; Klastersky & Paesmans, 2001; Verma et al., 2014). After participants had read the script, they were randomly assigned to a physician's advice. To manipulate eager versus vigilant ways of making a decision, half of the participants randomly received recommendations for hospice care that emphasized gains they could achieve (eagerness) if they choose hospice care. They read the following:

Your doctor tells you that symptom-focused treatment (hospice care) helps to promote a higher quality of life. The doctor recommends you to choose this option because it will lead to achieving the best results in your situation.

The other half of the participants received recommendations for hospice care that emphasized losses they could avoid (vigilance) if they choose hospice care. They read the following:

Your doctor tells you that symptom-focused treatment (hospice care) helps to prevent a low quality of life. The doctor recommends you to choose this option because it will lead to avoiding the worst losses in your situation.

At the next step, participants decided whether they want to accept the advice (and choose hospice care) or reject it and continue chemotherapy. Upon deciding, all participants reported their attitudes toward hospice, their previous experience with hospice and demographic characteristics. Finally, participants received a “thank you” note and compensation for their time.

Measures. Regulatory focus of participants was measured by the validated RFQ 11-item scale (Higgins et al., 2001). Participants rated their history of promotion and prevention success and failure on a 5-point Likert scale from 1 (never or seldom) to 5 (very often). Six items measured promotion orientation and 5 items measured prevention orientation. Each variable was created based on the sum of answers to these items: promotion ($\alpha = .69$) and prevention ($\alpha = .82$). The mean promotion score was ($M = 21.18, SD = 3.48$) and the mean prevention score was ($M = 16.63, SD = 4.05$). Regulatory focus is possible to analyze as a single variable predominant promotion pride or prevention pride using the difference score of promotion minus prevention. To distinguish between predominantly promotion-oriented people and predominantly prevention-

oriented people, a single categorical variable was computed. The prevention score was subtracted from the promotion score. That created a single continuous variable with positive and negative scores. Participants with positive scores were considered to have a predominantly promotion focus; participants with negative scores were considered to have a predominantly prevention focus. Six participants had the score of zero and were excluded from the analysis because they had no predominance. Thus, the final sample included 273 participants. The validity and reliability of this method were reported in Higgins et al. (2001).

Regulatory Fit and Non-fit Conditions. In the fit condition, prevention-oriented participants received advice that emphasized avoiding losses, and promotion-oriented participants received advice that emphasized achieving gains. In the non-fit condition, prevention-oriented participants received advice that emphasized achieving gains, and promotion-oriented participants received advice that emphasized avoiding losses. The experiences of individuals in promotion fit/non-fit and prevention fit/non-fit are theoretically equivalent, (Avnet & Higgins, 2006; Koenig et al., 2009, Higgins, 2000). Therefore, it is a common practice to collapse promotion/prevention fit and non-fit into the two conditions of fit versus non-fit. In my studies, I followed this method and combined across the two fit conditions and two non-fit conditions. While in the main analysis, I used the collapsed conditions, I followed it with additional tests that explored promotion and prevention non-fit effects separately. As theoretically predicted, the additional analysis did not reveal any substantial differences between promotion and prevention non-fit effects on attitude change.

Attitude toward hospice. The dependent variable “attitude toward hospice” was constructed based on the 5 items. Participants rated to what extent they agree with the statements on a 7-point Likert scale from 1 = Strongly Disagree to 7 = Strongly agree: “Hospice

care allows people to manage things that are happening with them;” “Hospice care positively changes people’s lives” “Hospice care negatively changes people’s lives (reversed);” “Hospice care helps people to achieve goals”, and “Hospice care helps people to avoid loss” These questions were averaged into the variable positive attitude toward hospice ($\alpha = .85$, $M = 4.87$, $SD = 1.13$).

Results

Advice acceptance. There was no difference in frequency of advice acceptance between participants in the fit and non-fit conditions, $\chi = 1.04$, $p = .18$ (see Table 1). There was no difference in the following demographic characteristics: gender, education, a socioeconomic status between these who chose hospice care or chemotherapy. However, ANOVA test with the choice as a random factor revealed that people who rejected advice are significantly younger than those who accepted advice for hospice care, $F(1) = 4.64$, $p = .03$.

Table 1: Choice Distribution

	Chemo	Hospice
Non-Fit	21%	30%
Fit	17%	32%

Attitude toward Hospice. At the first step of the analysis, I compared attitudes toward hospice between participants who accepted advice for hospice care or rejected the advice. Two items on the attitude scale which explicitly measured a positive or negative attitude toward hospice were used for this analysis. It was found that those participants who accepted advice (and chose hospice care) scored significantly higher agreeing with the positively worded item

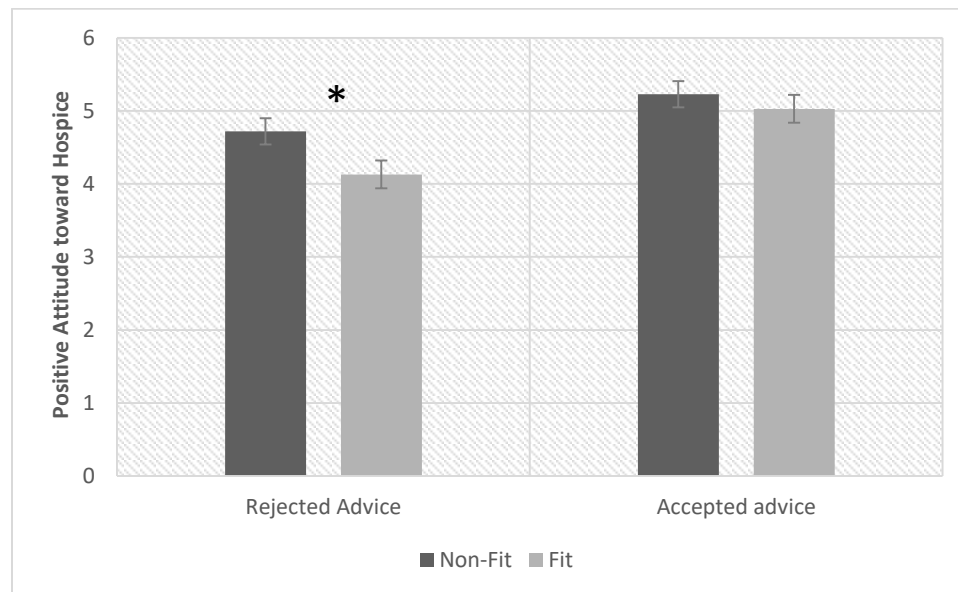
“Hospice care positively changes people’s lives,” $F(1) = 7.89, p < .01, \eta^2 = .04, M = 5.28, SD = 1.30$ compared to those who rejected the physician advice (and chose chemotherapy), $M = 4.68, SD = 1.47$. Consistent with these findings, participants who rejected the advice for hospice care scored significantly higher agreeing with negatively worded item “Hospice care negatively changes people’s lives,” $F(1) = 18.43, p < .001, \eta^2 = .08, M = 3.41, SD = 1.40$ compared to those who accepted the physician advice toward hospice care ($M = 2.50, SD = 1.37$). Thus, accepting the advice was associated with an initial positive attitude, while rejecting the advice was associated with an initial negative attitude toward recommended hospice care.

To confirm valence of items on the scale, I ran the following analysis. I subtracted the positively worded item from the negatively worded item. This variable had strong negative correlations with other items on the attitude scale: hospice helps to manage things ($r^2 = 0.34, p < .001$) helps achieve gains ($r^2 = 0.37, p < .001$) and hospice helps avoid losses ($r^2 = 0.18, p < .001$). This analysis confirmed that these three items measured a positive attitude toward hospice care. Therefore, I combined these three items, the item that has explicitly positive wording and the item that has explicitly negative wording (reversed) in the variable attitude toward hospice by taking an average of these items ($\alpha = .85$). Higher scores on this variable reflected a more positive attitude (and lower scores reflected a more negative attitude). In the further analysis, the variable attitude toward hospice was used as a dependent variable.

At the next step, a 2-way interaction 2 (fit; non-fit) x 2 (rejected advice; accepted advice) was tested using PROCESS procedure, Model 1 (Hayes, 2013). The bootstrapping method was chosen because this analysis is less affected by limitations that include low power, type I error inflation, lack of normality in the sampling distribution or presence of outliers. The covariate “experience with hospice” was included as it was significantly positively correlated with

participants attitude toward hospice care ($r^2=0.02, p = .02$). Notably, the significant effects remained significant when experience with hospice was not included as a covariate. A significant main effect of participants choice indicated that the participants who chose to follow the advice to enroll in a hospice program reported a significantly more positive attitude toward it ($M = 5.13, SD = 1.09$) than those who chose not to follow this advice ($M = 4.46, SD = 1.10; \beta = 0.54, t = 2.92, p < .001$). As shown in Figure 1 and consistent with the main prediction, among the participants who did not follow the physician's advice, those who were in the non-fit condition *disliked* hospice care significantly *less*, $M = 4.73, SD = 1.00, \beta = -0.58, t = -2.43, p < .01, 95\% CI = [-0.99, -0.17]$, than the participants in the fit condition ($M = 4.14, SD = 1.13$). The interaction between choice and fit/non-fit did not reach a significant level, $\beta = 0.35, t(268) = 1.32, p = .18, 95\% CI = [-0.17, 0.88]$.

Figure 1: Attitude toward hospice as a function of following advice for hospice or rejecting advice and having a fit or a non-fit advice message



* $p < .05$;

Additional Analysis. At the next step, I intended to check whether there is a difference between promotion and prevention fit/non-fit. To do so, I ran a 3-way analysis that included the following interaction: 2(promotion; prevention) x 2(advice emphasizes gains; emphasizes losses) x 2(rejected advice; accepted advice). The interaction was not significant, $\beta = -3.71$, $t = -0.93$, $p = .35$, 95% CI = [-11.56, 4.12]. None of 2-way interactions showed significant results. I also conducted analysis inserting promotion/prevention variable as a continuous measure and found not significant results for 3-way interactions, $\beta = -0.13$, $t = -0.47$, $p = .64$, 95% CI = [-0.68, 0.42], as well as not significant results for all 2-way interactions.

Furthermore, I explored whether the non-fit effect on attitude change is the same for promotion and prevention-oriented participants if they had a negative attitude towards hospice (rejected advice). I split the file and included only participants who rejected the advice of the physician and ran a 2-way analysis. It included the following interaction: 2 (promotion and prevention continuous variable) x 2(advice emphasizes: gains; losses). The interaction was not significant, $\beta = 0.35$, $t = 1.56$, $p = .12$, 95% CI = [-0.10, 0.81].

Discussion

Consistent with the hypothesis, results showed that those participants, who rejected advice to enroll in a hospice program, showed a better attitude toward the rejected option if they experienced regulatory non-fit. These findings provide an important theoretical insight suggesting regulatory non-fit as an intervention to reduce strong negative reactions and facilitating a more neutral opinion toward an offered option. The findings also imply a practical application of regulatory non-fit for situations in which an expert has to recommend a potentially frightening or unpleasant option. Specifically, if a practitioner uses regulatory non-fit recommending a disliked option, even if a decision-makers reject it, they might be more open

toward discussing this option in the future as their initial negative attitudes toward it was reduced.

The limitation of this study is that attitude toward hospice was measured only after participants received advice and made their choice. Therefore, it is difficult to delineate causal relationships between these two events and attitudes. To address this limitation, in the following studies, I measured attitude toward hospice before and after manipulations and used the attitude change improvement as the dependent variable. Measuring attitude twice and focusing on the attitude change improvement helped me to control for the impact of other events that could influence participants' attitudes toward hospice except for the manipulation.

Study 2: Initial Attitude and Attitude Change Improvement

Study 2 explores whether previous findings held for individuals with naturally occurring negative attitudes toward hospice. Individuals who observed a friend or relative with cancer and on hospice care participated in this study. Before and after receiving advice, participants reported their attitude toward hospice care. The dependent variable was an attitude change. In addition, regulatory focus was manipulated rather than measured. The following hypothesis was tested:

H1: For participants with an initial negative attitude, there will be a stronger attitude change improvement in the non-fit condition compared to the fit condition.

In addition, I examined the relationship between regulatory non-fit, negative emotions and participants' choice. Previous research has found that when stakes are high, negative emotions affect patients' choices (Zikmund-Fisher, Fagerlin, & Ubel, 2010). Research on

regulatory non-fit suggested that participants invest more cognitive efforts in information procession in the non-fit condition (Koenig et al., 2009). Based on these findings, I expected that in the non-fit condition, participants would report less negative emotions as they would focus on the cognitive processing of arguments provided by a physician. If advice causes less negative emotions, participants might be more open toward following the advice and choose hospice care. The following hypotheses were tested:

H2: In the non-fit condition, participants with an initial negative attitude will report less negative emotions after the conversation with their physician.

H3: For participants with an initial negative attitude, the positive relation between regulatory non-fit and choosing hospice will be mediated by non-fit reducing negative emotions.

Methods

Participants. A total of 318 Mturk workers (44% male; M age = 55; SD age = 11.1) completed the study for monetary compensation. Participants whose age is more than 50 years old were encouraged to participate in this study. Furthermore, I pre-screened participants for having experience with cancer or hospice care by asking them whether they had observed anyone on hospice care or had a friend/relative who was diagnosed with cancer. Forty-four participants who passed the pre-screen questions failed to answer open-ended questions about their experience with hospice care or cancer at the end of the questionnaire. They were excluded from the analysis. The resulted amount of participants was 274.

Procedure. Upon entering the survey, participants imagined being diagnosed with lung cancer as in Study 1. They learned that they have two options available: non-cancer directed treatment (hospice care) or cancer-directed treatment (chemotherapy). The participants reported

their attitude toward hospice. Unlike Study 1, participants regulatory focus was manipulated using the method of Higgins, Roney, Crowe, and Hymes (1994). Participants listed their ideal goals (hopes and aspirations) in the promotion condition or listed their ought goals (duties and responsibilities) in the prevention condition.

Upon completing this task, all the participants received the recommendations to enroll in hospice care. The advice was randomized as follows: half of the promotion and prevention-oriented participants received the advice that emphasized how hospice care will help them achieve gains. The other half of the promotion and prevention-oriented participants received the advice that emphasized how hospice will help them avoid losses. After reading the advice, participants reported their attitude toward hospice care. They also predicted to what extent they would experience fear, anxiety, and sadness receiving this advice. In the end, participants chose between chemotherapy and hospice care. Finally, they answered questions about their hospice experience and demographic questions, similarly to Study 1.

Measures

Initial attitude toward hospice. At the beginning of the survey, after reading the script and information about available options, participants provided their agreement with the five statements, the same as in Study 1, on a seven-point Likert scale (1 = Strongly Disagree 7 = Strongly Agree). The only difference with Study 1 was that questions assessed participants' opinions about hospice with regard to themselves instead of their general attitude (e.g. hospice will help *me* to manage things). The five questions were combined in a variable "pre-advice attitude measure" ($\alpha = .83$, $M = 5.27$ $SD = 1.13$). A variable "initial attitude toward hospice" was created by subtracting the scores on the negatively worded item (e.g., "hospice care will negatively change my life") from the scores of the positively worded item (e.g., "hospice care

will positively change my life”). Positive scores on “initial attitude toward hospice” variable identified those participants with an initial positive attitude toward hospice care and included 77% (n = 212) of participants, while negative scores identified those participants with an initial negative attitude toward hospice care and included 23% (n =62) of participants. The choice to use 2 items instead of the five items was driven by the goal to identify people who have a stronger negative attitude than a positive attitude. Using five items for the categorical variable does not accomplish this goal because the group that scored below mean still had a very positive initial attitude toward hospice. Notably, in the follow-up studies using a dichotomous variable, I replicate the findings of this study. That indicates that the results are not idiosyncratic to the method of analysis.

Attitude change improvement. The dependent variable “attitude change improvement” was based on comparing the pre-advice attitude measure collected at the beginning of the survey and the post-advice attitude measure collected after the fit/non-fit manipulation. Post-advice attitude variable ($\alpha = .86$, $M = 5.43$ $SD = 1.09$) was constructed the same way as Pre-advice attitude variable. Subtracting the mean scores of the pre-advice attitude from the post-advice attitude created attitude change improvement variable. More positive numbers on this variable reflected greater improvement in attitude toward hospice care.

Regulatory Fit and Non-Fit Conditions. Regulatory fit and non-fit conditions were created through the combination of the regulatory goal orientation manipulation and advice framing. Those participants for whom prevention focus was induced were assigned to the fit condition if they received advice that emphasized avoiding losses and to the non-fit condition if they received advice that emphasized achieving gains. Those participants for whom promotion focus was induced were assigned to the fit condition if they received advice that emphasized

achieving gains and to the non-fit condition if they received advice that emphasized avoiding losses.

Negative emotional experience. Participants rated on a seven-point Likert scale ($1 = \textit{not at all}$, $7 = \textit{very much}$) to what extent they felt anxious, sad, fearful, right and wrong when the physician provided advice. These emotional experiences (with feeling “right” being reversed) were combined into a negative emotional experience variable ($\alpha = .85$, $M = 4.23$, $SD = 1.39$).

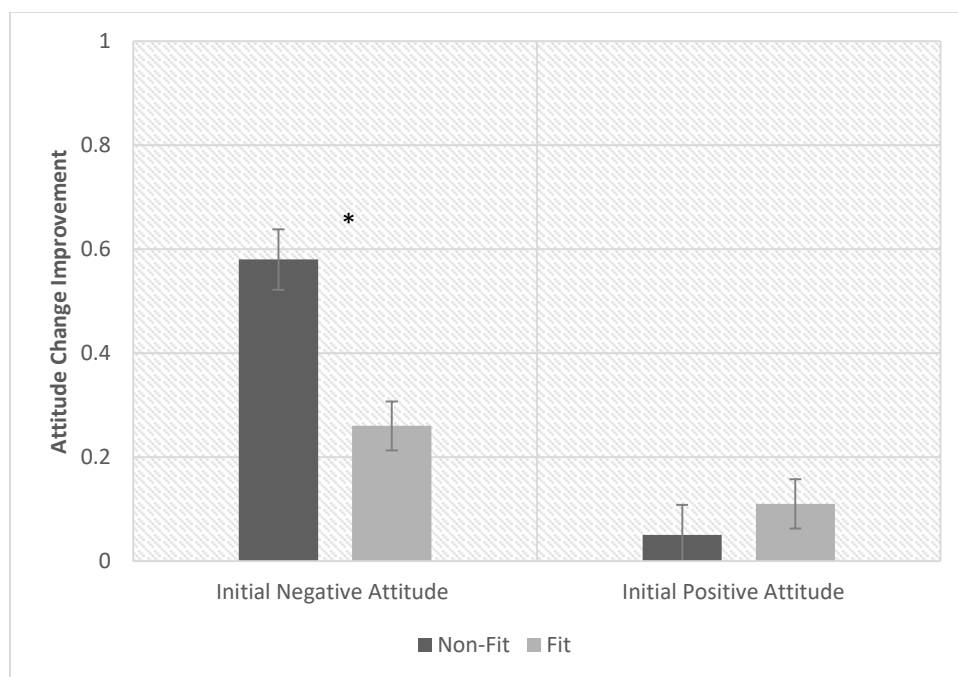
Results

Attitude change improvement. To explore the effect of regulatory non-fit, I regressed the following interaction 2 (regulatory fit: fit; non-fit) x 2(initial attitude: negative; positive) using PROCESS procedure Model 1 (Hayes, 2013) on attitude change improvement as a dependent variable.

There was a significant interaction between regulatory fit/non-fit and an initial attitude, $\beta = 0.39$, $t(268) = 2.26$ $p = .03$, 95% CI [0.05, 0.74], indicating that the impact of regulatory non-fit on attitude change improvement differed as a function of initial attitude. As Figure 2 shows, participants with an initially positive attitude did not change it significantly different by conditions ($M_{fit} = 0.05$, $SD_{fit} = 0.78$; $M_{non-fit} = -0.03$, $SD_{non-fit} = 0.84$; $\beta = 0.11$, $t < 1$). However, consistent with the main hypothesis, participants with an initially negative attitude had more attitude improvement in the non-fit condition ($M_{non-fit} = 0.58$, $SD_{non-fit} = 0.67$), than participants in the fit condition $M_{fit} = 0.26$, $SD_{fit} = 0.62$; $\beta = -0.32$, $t = 2.15$, $p = .03$, 95% CI [-0.62, -0.03]. Additional analysis have shown that the interaction between non-fit/fit and a continuous measure of initial attitude (which resulted from the subtraction of scores of a negatively worded item from a positively worded item) was not significant, as expected, $\beta = 0.04$, $t(268) = 1.58$, $p = .11$.

Furthermore, the analysis of the interaction: initial attitude continuous (5 items averaged) x 2(regulatory fit: fit; non-fit) did not show significant results as well, $\beta = 0.07$, $t(268) = 1.19$, $p = .23$. These results supported the conceptualization that the strength of initial attitude matters for observing the non-fit effect.

Figure 2: Attitude change improvement as a function of measured initial attitudes conditions and having a non-fit or fit advice message.



* $p < .05$

Additional Analysis. As in Study 1, a 3-way interaction tested whether there is a difference in results by prevention or promotion fit: 2(promotion; prevention) x 2(fit; non-fit) x 2(initial positive attitude; initial negative attitude). The 3-way interaction was not significant, $\beta = 0.46$, $t(264) = 1.32$, $p = .18$.

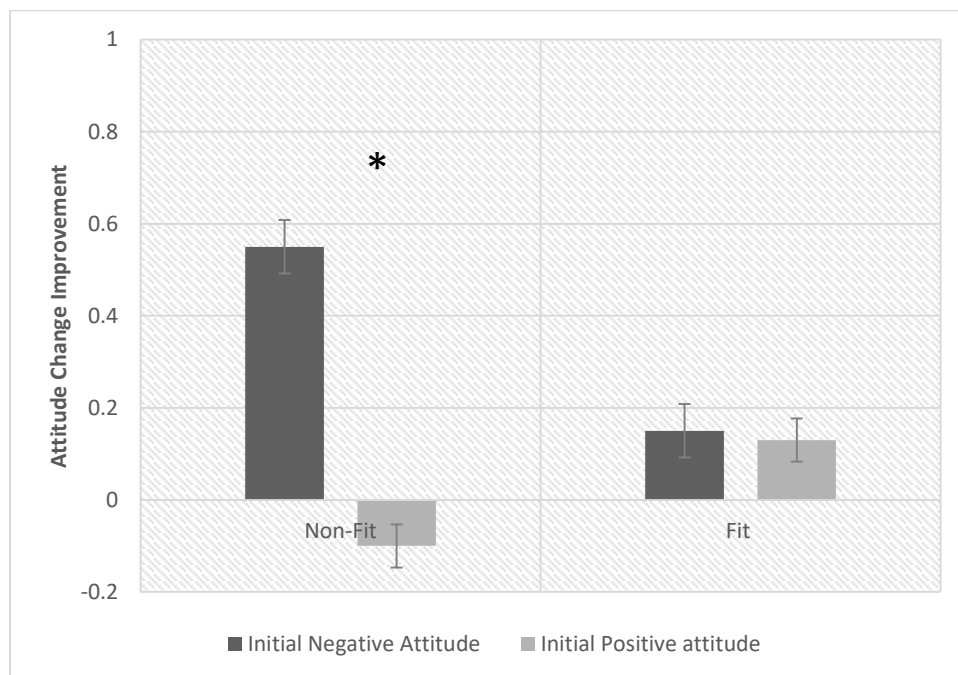
Furthermore, for participants who experienced prevention regulatory fit ($n = 130$), I regressed the following interaction 2(fit; non-fit condition) \times 2 (initial negative attitude toward hospice; initial positive attitude toward hospice) on the depended variable attitude change improvement. There was a main effect of the initial attitude toward hospice, $\beta = -0.47$, $t = -2.73$, $p = .01$, 95% CI = [-0.82, -0.13], indicating that participants who had initial negative attitude toward hospice changed it significantly more ($M = 0.55$, $SD = 0.63$) than participants who had initial positive attitude ($M = 0.10$, $SD = 0.61$). The further analysis demonstrated that participants who had initial negative attitude towards hospice improve their attitude slightly (non-significantly) more in the non-fit condition ($M = 0.60$, $SD = 0.63$; $\beta = -0.13$, $t < 1$), compared to the fit condition ($M = 0.47$, $SD = 0.62$). There were no significant relationships between the fit and non-fit condition for participants who had initial positive attitude toward hospice ($\beta = -0.04$, $t < 1$). The interaction was not significant ($\beta = -0.09$, $t < 1$).

For participants ($n = 143$) who experienced promotion regulatory fit, the same analysis was conducted. A main effect of initial attitude towards hospice care was significant, $\beta = -0.57$, $t = -3.21$, $p < .01$, 95% CI = [-0.91, -0.21], indicating that participants who had initial negative attitude toward hospice improved it significantly more ($M = 0.34$, $SD = 0.68$) than participants who had initial positive attitude toward hospice ($M = 0.06$, $SD = 0.54$). There was a main effect of the fit and the non-fit conditions, $\beta = -0.41$, $t = -2.06$, $p = .04$, 95% CI = [-0.81, -0.02], suggesting that participants in the non-fit condition improved their attitude towards hospice significantly more ($M = 0.27$, $SD = 0.64$) than in the fit condition ($M = 0.13$, $SD = 0.53$). The interaction was significant, $\beta = 0.55$, $t = 2.41$, $p = .02$, 95% CI = [0.10, 1.00]. As shown on the Figure 3, participants who had initially negative attitude towards hospice care improved it significantly more, $M = 0.55$, $SD = 0.74$, $\beta = -0.41$, $t(125) = -2.05$, $p = .04$, 95% CI = [-0.81, -

0.02] in the condition of non-fit compared to the fit condition ($M = -0.15$, $SD = 0.61$).

Participants who experienced positive attitude towards hospice were not affected significantly by conditions ($\beta = 0.14$, $t = 1.26$, $p = .21$).

Figure 3: Attitude change improvement about hospice as a function of measured initial attitudes and having a promotion fit or promotion non-fit advice message.

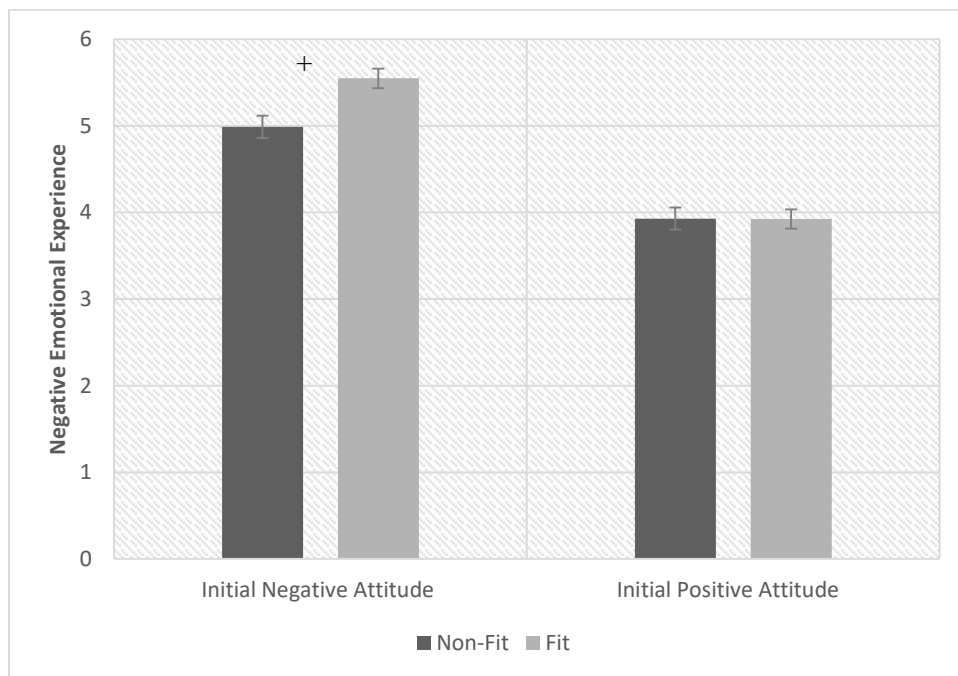


* $p < .05$

Negative emotional experience. To explore the effect of regulatory non-fit on negative emotional experience, the interaction 2(regulatory fit: fit; non-fit) x 2(initial attitude: negative; positive) was regressed on negative emotional experience as the dependent variable using PROCESS procedure Model 1 (Hayes, 2013). As expected and shown on Figure 4, participants who had an initial negative attitude toward hospice care experienced marginally less negative emotion during the conversation in the non-fit condition, $M_{non-fit} = 4.99$, $SD_{non-fit} = 1.10$; $\beta =$

0.56, $t = 1.73$, $p = .09$, 95% CI [-0.08, 1.21], compared to the fit condition ($M_{fit} = 5.55$, $SD_{fit} = 0.98$). As predicted, there was no difference in negative emotional experience as a function of non-fit/fit conditions for participants who had an initial positive attitude toward hospice care ($\beta = -0.02$, $t < 1$). The interaction did not reach significant results, $\beta = -2.82$, $t(268) = 1.52$, $p = .12$, 95% CI [-1.29, 0.16].

Figure 4: Negative emotional experience as a function of measured initial attitudes toward hospice and a regulatory fit/non-fit advice message.



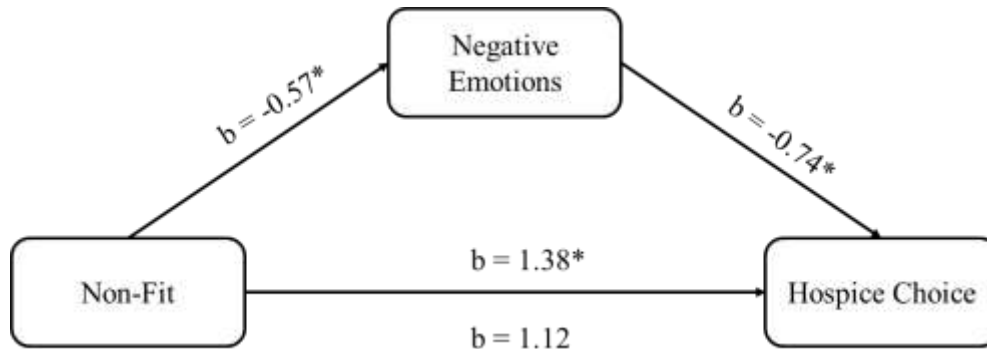
+ $p < .10$

Hospice care choice. There was a significant effect of an initial attitude on the proportion of individuals who accepted the physicians' advice and chose hospice care ($\chi^2 = 43.37$, $p < .001$). Supporting the dichotomization of participants into positive versus negative initial attitude, 80% of participants in the initially positive attitude condition chose hospice care whereas only 39% of participants in the initial negative attitude condition did so. There was no

difference in the proportion of individuals who accepted the physician advice and chose hospice care as a function of regulatory fit/non-fit conditions ($\chi^2 = 1.51, p = .22$). However, as expected, there was a significant difference in the proportion of individuals with initial negative attitude who accepted the physicians' advice for hospice as a function of regulatory non-fit condition ($\chi^2 = 6.34, p = .01$). Specifically, among those participants with initial negative attitudes who chose hospice care (39% of them chose hospice care), 72% of them had experienced non-fit compared to only 28% who had experienced regulatory fit.

Mediation effect of negative emotions. In this part, I examined whether, for participants with an initially negative attitude toward hospice, the increased choice of hospice in the non-fit condition was due to non-fit reducing negative emotions. To test this hypothesis, I ran a mediation analysis using PROCESS procedure Model 4 (Hayes, 2013), including only participants with an initially negative attitude toward hospice ($n = 61$; Figure 5). The relationship between regulatory non-fit/fit conditions and negative emotional experience was significant, $\beta = -0.57, t(60) = -2.10, p = .04, 95\% \text{ CI } [0.03, 1.11]$, consistent with the finding above. In addition, the relationship between regulatory non-fit/fit conditions and choice of hospice were also significant, $\beta = 1.38, z = 2.46, p = .01, 95\% \text{ CI } [-2.49, -0.28]$, whereby participants who experienced regulatory non-fit were more likely to choose hospice. Importantly, the indirect effect of regulatory non-fit condition on hospice choice via a decrease in negative emotions was significant, $\beta = -0.42, 95\% \text{ CI } [-1.25, -0.04]$. After accounting for this indirect effect, the direct effect of the regulatory non-fit condition on hospice choice was not significant, $\beta = 1.12, z = 1.87, p = .06, 95\% \text{ CI } [-2.29, 0.05]$, suggesting that the reduction in negative emotion fully mediated the positive relationship between regulatory non-fit and choosing hospice.

Figure 5: Negative emotional experience mediates the relationship between a regulatory non-fit advice message and the choice of hospice (for participants with an initial negative attitude toward hospice).



* $p < .05$

Discussion

Supporting the hypothesis and consistent with the results of Study 1, participants with an initially negative attitude toward hospice care improved their attitude more if they received advice in a regulatory non-fit (vs. fit) manner. Importantly, I found that the relationship between regulatory non-fit and hospice choice was mediated by negative emotional experience. Specifically, for participants with an initially negative attitude toward hospice, regulatory non-fit decreased the negative emotional experience, which, in turn, increased the likelihood that they chose hospice care, the recommended but initially disliked option.

This study adds to the non-fit research, by suggesting that the regulatory non-fit influences attitude change. Specifically, while studies have demonstrated that regulatory fit improves attitude and motivation (Ludolph & Schulz, 2015), I found that if the initial attitude is

negative, its regulatory non-fit that should be used to improve attitude. A limitation of this study is that most participants with an actual experience with hospice had a positive attitude toward it. In retrospect, this is not surprising given that families in which a relative was in hospice care are generally satisfied with their choice and feel that it was helpful for them (Cagle, Pek, Clifford, Guralnik, & Zimmerman, 2015; Wright et al., 2008). As a result, I had to adjust methodology in this study to identify participants with an initial negative attitude toward hospice care. That created the unequal amount of participants who had an initial negative attitude toward hospice and initial positive attitude toward hospice. In further studies, I address this limitation by experimentally manipulating initial attitudes toward hospice.

Study 3: Induced Attitude and Attitude Change Improvement (Hospice Care)

Study 3 examines again participants' attitude change improvement following physician's advice that creates a regulatory fit or non-fit with participants' regulatory focus orientation. Unlike in previous studies, in this study, participants' initial attitude toward hospice care was manipulated. The following hypothesis was tested:

H1: Participants with an induced initial negative attitude will have a stronger attitude change improvement in the non-fit condition compared to the fit condition.

In addition, I aimed to explore whether attitude change results in participants greater satisfaction with their initially disliked choice. The following hypothesis was tested:

H2: Participants with an induced initial negative attitude will have a stronger, choice satisfaction of hospice care in the non-fit condition compared to the fit condition.

Methods

Participants. A total of 101 ($M_{age} = 38.90$, $SD_{age} = 15.24$, Male = 41%) individuals were recruited in the online survey via Mechanical Turk labor market. At the beginning of the survey, participants answered questions about their experience with healthcare, cancer, and end-of-life choices. Among these questions, participants reported whether they observed anyone being in hospice care. If they answered “no,” they were allowed to enter the survey. This procedure ensured that all participants in this study had no prior experience with hospice care.

Procedure. Upon entering the survey, participants underwent the attitude manipulation. This manipulation was created based on the pre-collected comments among other people who experienced hospice care. For the positive attitude condition, I chose four positive comments, such as, “Hospice was wonderful. My aunt was dying from cancer, and they provided everything she needed. And they came to our home and met with us and worked with us,” and two negative comments, such as, “My mother had lung cancer and spent her last few months in a nursing home under hospice care; they were unable to make her comfortable or relieve her pain.” The comments were completely anonymous. For the negative condition, I used the same basic content of the comments but altered the wording to reverse the valence of the evaluation, such as “Hospice was horrible. My aunt was dying from cancer, and they did not provide anything she needed. And they rarely came to the home and met with us or worked with us.” By reversing the valence in this way, the four positive comments were altered to be negative comments, and the two negative comments were altered to be positive comments as presented in Table 2.

Table 2: Pre-collected comments of participants about hospice care for inducing positive and negative attitude condition

Positive Attitude Condition	Negative attitude condition
-----------------------------	-----------------------------

Hospice was wonderful. My aunt was dying from cancer, and they provided everything she needed. And they came to our home and met with us and worked with us. They were quick to respond to calls.

My mother had lung cancer and spent her last few months in a nursing home under hospice care; they were unable to make her comfortable or relieve her pain.

I worked with people who had chosen hospice. They were very well cared for and often were together with family or hospice worker.

We made the decision to keep my grandmother out of hospice after two meetings with representatives and also information we had researched on the group. The representatives were really scummy and creepy.

Both of my parents died of cancer. My Mom had stomach cancer, and hospice was incredibly helpful! My Dad had cancer three different times; the lung cancer was terminal. When he had about a month to live hospice was absolutely amazing for me and my family.

I have had grandparents die in hospice I have been there with them at the end of their life. It was a very positive experience. It gave them the quality of life. They were taken care of and monitored closely.

Hospice was horrible. My aunt was dying from cancer, and they did not provide anything she needed. And they rarely came to the home and met with us or worked with us. They were very slow to respond to calls.

My mother had lung cancer and spent her last few months in a nursing home under hospice care; they were able to make her comfortable and relieve her pain.

I worked with people who had chosen hospice. They were not well cared for and often were alone without family or hospice worker.

We made the decision to keep my grandmother in hospice after two meetings with representatives and also information we had researched on the group. The representatives were really kind and pleasant.

Both of my parents died of cancer. My Mom had stomach cancer, and hospice was incredibly not helpful! My Dad had cancer three different times; the lung cancer was terminal. When he had about a month to live, hospice was absolutely horrible for me and my family.

I have had grandparents die in hospice. I have been there with them at the end of their life. It was a very negative experience. It did not give them the quality of life. They were not taken care of or monitored closely.

After this manipulation, participants reported their agreement with five statements about hospice care. As in Study 2, the regulatory focus was manipulated. Participants listed either their ideal goals that induced a promotion focus or their ought goals that induced a prevention focus (Higgins et al., 1994). Upon completing the regulatory focus manipulation, participants read the same scripts as in Study 1 and 2. Then, participants received advice to choose hospice

care. Half of the participants received the advice that emphasized gains of choosing hospice care. The other half of the participants received advice that emphasized avoiding losses if hospice was chosen.

Unlike in Studies 1 and 2, participants were told to imagine that they carefully considered each option and decided to follow their physician's advice. Participants reported their choice satisfaction. This procedure helped me to explore participants' satisfaction with their choice. Since I procedurally limited freedom of choice telling participants that they followed physician's advice, I also measured participants' trust in their physician's expertise. In the end, participants' attitude toward hospice care was measured again. Finally, participants answered demographic questions and read a disclosure note that revealed fictitious nature of the comments at the beginning of the survey.

Measures

Attitude change improvement. To measure participants' attitude change improvement, participants reported their attitude toward hospice care twice, before and after the manipulation. The first time, participants rated their agreement with the same five statements as in Study 2. The five questions were combined in a variable pre-advice attitude toward hospice care 1 ($\alpha = .89$, $M = 4.24$ $SD = 1.35$). The second time, each participant rated his/her agreement with the same five statements about hospice as if he/she was a person in the script who had chosen hospice care. The five questions were combined in a variable post-advice attitude toward hospice care ($\alpha = .89$, $M = 4.74$ $SD = 1.19$). On both variables pre-advice and post-advice, the larger score meant a more positive attitude. The variable "attitude change improvement" was calculated by subtracting scores of the pre-advice measure from the post-advice measure. More

positive numbers on this variable reflected greater improvement of the attitude toward hospice care.

Regulatory Fit and Non-fit Conditions. Regulatory fit/non-fit experiences were created through the combination of the regulatory goal orientation manipulation and advice framing. Those participants for whom prevention focus was induced were assigned to the fit condition if they received advice that emphasized avoiding losses and to the non-fit condition if they received advice that emphasized achieving gains. Those participants for whom promotion focus was induced were assigned to the fit condition if they received advice that emphasized achieving gains and to the non-fit condition if they received advice that emphasized avoiding losses.

Choice satisfaction. In addition, participants reported their choice satisfaction that included choice confidence, satisfaction with, and commitment to a chosen option. These three items were rated on a 7-point Likert scale (1-not at all or 7-very much). The items were combined into the variable “Choice Satisfaction” ($\alpha = .90$).

Results

Manipulation check. The participants who read positive comments about hospice reported a significantly more positive attitude toward hospice (Pre-advice Attitude Measure), $M = 5.02$, $SD = 0.94$, than those participants who read negative comments, $M = 3.48$, $SD = 1.26$, $\eta^2 = .33$, $F(1) = 49.31$, $p < .001$.

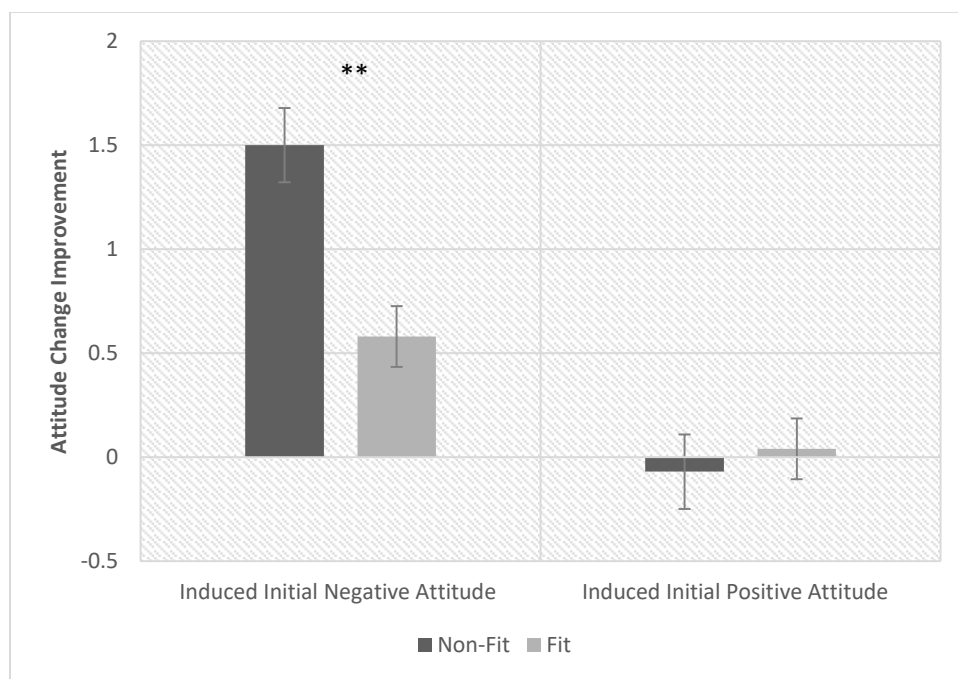
As additional manipulation checks, the explicit positive and negative questions were used that asked participants to rate their agreement with the following statements: “Hospice care negatively changes people’s lives” and “Hospice care positively changes people’s lives.” It was found that the participants in the negative attitude condition rated significantly more negatively

the negatively worded question ($M = 4.67$, $SD = 1.61$) than participants in the positive attitude condition, $M = 3.10$, $SD = 1.45$, $\eta^2 = .21$, $F(1) = 26.83$, $p < .001$. The participants in the positive attitude condition rated significantly more positively the positively worded question ($M = 5.20$, $SD = 1.44$), than participants in the negative attitude condition $M = 3.71$, $SD = 1.49$, $\eta^2 = .21$, $F(1) = 26.34$, $p < .001$. Thus, the manipulation was successful.

Attitude change improvement. To explore the attitude change improvement, 2-way analysis 2 (induced initial attitude: positive; negative) x 2 (regulatory fit; regulatory non-fit) with the dependent variable attitude change improvement was conducted using a PROCESS bootstrapping regression procedure, Model 1 (Hayes, 2013). Trust in the physician's expertise significantly predicted attitude change improvement ($r^2 = .05$, $\beta = -0.91$, $t = 2.35$, $p = .02$). Since participants did not have a choice but rather were informed that they followed physician advice, the covariate trust in the physician expertise was used in this analysis and all subsequent analyses. Notably, all significant effects remained significant when trust in the physician expertise was not included as a covariate. There was a main effect of the fit and non-fit advice, $\beta = -0.91$, $t(96) = -3.27$, $p < .01$, 95% CI [-1.49, -.034], revealing that the participants in the non-fit condition changed their attitude significantly more. In addition, there was a significant main effect of the initial attitude, $\beta = -1.57$, $t(96) = -5.44$, $p < .001$, 95% CI [-2.14, -1.00], showing that the participants with an initial negative attitude toward hospice improved it significantly more than the participants who already had a positive attitude toward hospice. A central to the prediction, and shown in Figure 6, analysis indicated that the participants who were in the (experimentally induced) negative initial attitude condition improved their attitude significantly more in the non-fit condition ($M = 1.50$, $SD = 1.23$) than in the fit condition, $M = 0.58$, $SD = 1.19$; $\beta = -0.91$, $t = -3.27$, $p = .01$ 95% CI = [-1.47, -0.36]. Participants who had an initial

positive attitude did not show significant difference in attitude change improvement between the fit ($M = 0.04$, $SD = 0.78$) and non-fit conditions ($M = -0.07$, $SD = 0.84$; $\beta = 0.11$, $t < 1$). The interaction between experimentally induced attitude and the regulatory fit conditions was significant, $\beta = 1.02$, $t(96) = 2.57$, $p = .01$, 95% CI = [0.23, 1.81].

Figure 6: Attitude change improvement as a function of the initial attitude conditions and having a non-fit or fit advice message.



** $p < .01$

Internal Analysis: In this analysis, the following items were used as independent variables: “hospice care negatively changes people’s lives” (a negatively worded item); “hospice care positively changes people’s lives” (a positively worded item). The scores of the positively worded items were subtracted from the negatively worded item to create a continuous variable indication initial negative attitude toward hospice. The interaction 2(initial negative attitude) x

2(regulatory fit, regulatory non-fit) was regressed on the dependent variable attitude change improvement.

There was a main effect of the initial attitude, $\beta = -0.28$, $t(96) = -6.72$ $p < .001$ 95% CI [-0.36, -0.20], suggesting that the participants with the negative attitude improved it more than the participants with the initial positive attitude toward hospice care. There was also a main effect of the fit/non-fit conditions, $\beta = -0.50$, $t(96) = -2.67$ $p < .01$ 95% CI [-0.86, -0.13], indicating that participants improved their attitude in the non-fit condition more than in fit. Confirming previous analysis, the interaction between continuous variable, initial negative attitude, and regulatory fit (fit; non-fit) was marginally significant, $\beta = 0.13$, $t(96) = 2.29$, $p = .02$, 95% CI = [0.02, 0.25]. A further analysis showed that people who had a relatively strong initial negative attitude toward hospice significantly improved their attitude toward hospice in the non-fit condition, $M = 1.59$, $\beta = -0.84$, $t = -3.27$ $p < .01$, 95% CI = [-1.35, -0.33], compared to the fit condition ($M = 0.75$). Whereas this was not the case for participants with relatively positive initial attitude toward hospice ($\beta = 3.67$, $t < 1$).

Additional Analysis. As in Study 1&2, a 3-way interaction tested whether there is a difference in the results by prevention or promotion fit: 2(promotion; prevention) x 2(fit; non-fit) x 2(induced initial attitude: positive, negative). The 3-way interaction was not significant, $\beta = 0.18$, $t(94) < 1$.

Promotion fit and prevention fit were tested separately with the dependent variable attitude change improvement. Participants who experienced prevention regulatory fit ($n = 51$), the following analysis was conducted: 2(fit; non-fit condition) by 2 (induced initial attitude

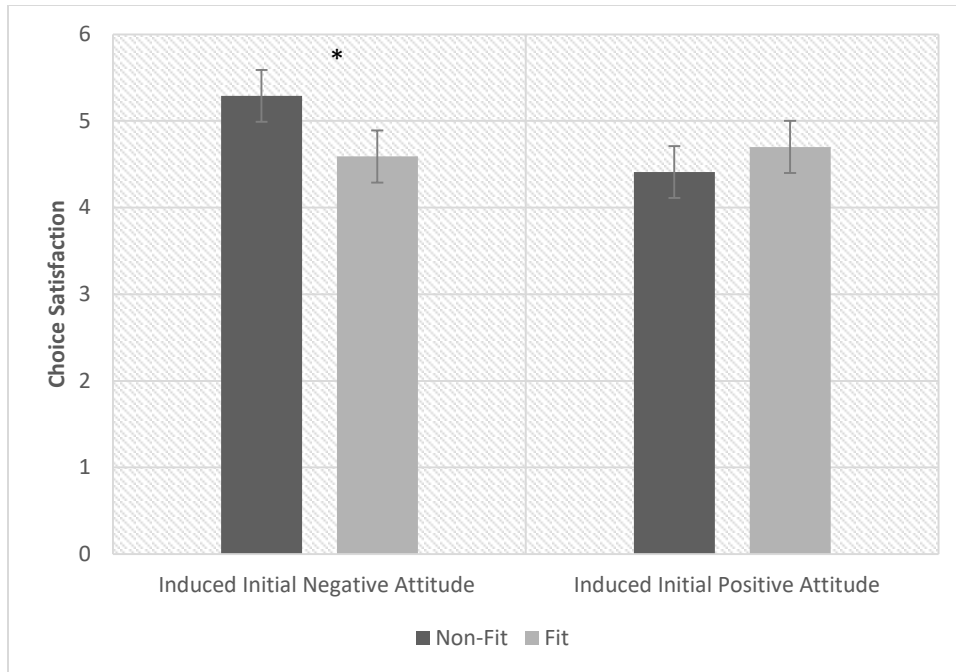
toward hospice: positive, negative) on the depended variable attitude change improvement. The central to the first hypothesis the interaction was not significant, $\beta = 0.71$, $t(46) = 1.29$, $p = .20$, 95% CI = [-0.40, 1.82]. However, there was a main effect of the initial attitude toward hospice, $\beta = -1.70$, $t(46) = -4.37$, $p < .001$, 95% CI = [-2.49, -0.92], indicating that the participants who had induced initial negative attitude changed it significantly more ($M = 1.34$, $SD = 1.20$) than participants who had induced initial positive attitude ($M = 0.01$, $SD = 0.60$). In addition, there was a main effect of the conditions, $\beta = -0.76$, $t(46) = -2.09$, $p = .04$, 95% CI = [-1.51, -0.03], indicating that the participants in the non-fit condition changed their attitude significantly more ($M = 0.95$, $SD = 1.38$) than the participants in the fit condition ($M = 0.50$, $SD = 0.91$). The further analysis demonstrated that the participants who had induced initial negative attitude improved their attitude significantly more in the non-fit condition, $M = 1.73$, $SD = 0.63$; $\beta = -0.77$, $t = -2.09$, $p = .04$, 95% CI [-1.51, -0.03], compared to the participants in the fit condition ($M = 0.97$, $SD = 0.62$). There were no significant relationships between the fit and non-fit conditions among participants who had induced initial positive attitude toward hospice ($\beta = -0.06$, $t < 1$).

For participants ($n = 50$) who experienced promotion regulatory fit the same analysis was conducted. The main effect indicated that participants who had induced initial negative attitude toward hospice improved it significantly more, $M = 0.57$, $SD = 1.27$; $\beta = -1.45$, $t(45) = -3.29$, $p < .01$, 95% CI = [-2.33, -0.56], than participants who had initial positive attitude toward hospice ($M = 0.01$, $SD = 0.96$). The main effect of the fit and the non-fit conditions revealed that participants in the non-fit condition improved their attitude towards hospice significantly more, $M = 0.51$, $SD = 1.06$; $\beta = -1.08$, $t(45) = -2.53$, $p = .02$, 95% CI = [-1.94, -0.22], than in the fit condition ($M = 0.04$, $SD = 1.17$). The interaction was marginally significant, $\beta = 1.13$, $t(45) =$

1.94, $p = .06$, 95% CI = [-0.04, 2.30]. Participants who had an initially negative attitude towards hospice care improved it significantly more, $M = 1.14$, $SD = 0.88$; $\beta = -1.08$, $t = -2.53$, $p = .02$, 95% CI = [-1.94, -0.22] in the condition of non-fit compared to the fit condition ($M = 0.12$, $SD = 1.37$). Participants who experienced a positive attitude towards hospice were not affected significantly by conditions ($\beta = 0.05$, $t = 1.14$, $p = .89$).

Choice satisfaction. To explore, choice satisfaction, a 2-way interaction 2 (fit; non-fit) x 2 (positive attitude induction; negative attitude induction) was regressed on choice satisfaction, using PROCESS bootstrapping regression procedure, Model 1 (Hayes, 2013). The covariate trust in physician expertise was included in this analysis as well. This analysis produced a marginally significant interaction, $\beta = 0.72$, $t = 1.71$, $p = .09$, 95% CI = [-0.11, 1.54]. As shown in Figure 7, participants with an induced negative attitude reported a greater satisfaction with their choice in the non-fit condition ($M = 5.06$, $SD = 1.74$) than in the fit condition, $M = 4.50$, $SD = 1.62$, $\beta = -0.56$, $t(96) = -1.90$, $p = .059$, 95% CI = [-1.14, 0.02]. Whereas participants with the induced positive attitude did not have difference in their choice satisfaction between the non-fit condition ($M = 4.63$, $SD = 1.48$) and the fit condition ($M = 4.79$, $SD = 1.65$, $\beta = 0.16$, $t < 1$).

Figure 7: Choice satisfaction as a function of attitude conditions and having a fit or non-fit advice message.



* $p < .05$

Discussion

Consistent with the first hypothesis, the results indicated that participants improved their attitude toward an offered unpleasant or frightening option, hospice care if the advice created a regulatory non-fit experience for them. Furthermore, this study demonstrated that in the condition in which initial negative attitude was reduced participants experienced greater satisfaction with their choice of hospice care.

Three studies consistently demonstrated that participants improve their attitude toward recommended option, hospice care if advice creates a regulatory non-fit experience. To check whether the hypothesis about attitude change is contingent on the type of the recommendation, in the next study, participants will receive the recommendation for chemotherapy.

Study 4: Induced Attitude and Attitude Change Improvement (Chemotherapy)

Study 4 replicates the procedure of Study 3 with one exception. Instead of recommending hospice, a physician in the vignette recommended chemotherapy to all participants. I aimed to check whether the effect of regulatory non-fit on participants' attitudes differed if an active rather than a passive option was recommended (e.g. chemotherapy rather than hospice care). As in Study 3, participants' initial attitude was manipulated. The advice was provided in a regulatory fit versus non-fit manner (by manipulating both regulatory orientation and advice framing). Participants' choice was standardized again by asking all participants to imagine that they chose the recommended option (chemotherapy). Participants reported their choice satisfaction. The same hypotheses as in Study 3 were tested:

H1: Participants with an induced initial negative attitude will have a stronger attitude change improvement in the non-fit condition compared to the fit condition.

H2: Participants with an induced initial negative attitude will have a stronger, choice satisfaction of chemotherapy in the non-fit condition compared to the fit condition.

Methods

Participants. A total of 155 ($M_{age} = 33.50$, $SD_{age} = 11$, Male = 32%) American Mechanical Turk workers participated in the online survey for monetary compensation. At the beginning of the survey, participants answer pre-screen questions to ensure that they did not have experience with both cancer and chemotherapy. In this data set, 24% of participants filled the questionnaire more than one time. Their answers were excluded from the analysis. Due to changes in Mechanical Turk regulations, I collected data via opening several hits in the Mturk website. This procedure increased the likelihood that participants enter the survey more than one

time. In addition, one person (regulatory fit condition) had an attitude change improvement score >3 standard deviations from the mean, changing from an extremely negative to extremely positive attitude. It is likely that this extreme attitude change was driven by the fact that the participant misread the scale. This outlier was excluded from the analysis.

Procedure. To manipulate initial attitude toward chemotherapy, participants first read the comments of other people who observed someone receiving chemotherapy at the beginning of the survey. Using the same procedure as in Study 3, I manipulated participants' initial attitude toward chemotherapy by presenting them with primarily positive (vs. negative) comments from other individuals describing their experience with chemotherapy. As shown in Table 3, participants in the initially positive attitude condition read four positive comments and two negative comments about chemotherapy. For the negative attitude condition, I used the same basic content of the comments but altered the wording to reverse the valence of the evaluation. Therefore, participants in the initially negative attitude condition read four negative comments and two positive comments about chemotherapy. Participants' initial attitude toward chemotherapy care was then assessed using the five Likert-scale questions.

Table 3: Comments used to inform participants about chemotherapy experience and manipulate participants' initial attitude toward chemotherapy.

Initial positive attitude condition	Initial negative attitude condition
<p>My brother was diagnosed with cancer and chose to undergo chemotherapy. It had positive results within a year of starting the therapy</p>	<p>My brother was diagnosed with cancer and chose to undergo chemotherapy. It had no positive results within a year of starting the therapy</p>
<p><i>I have had friends who have done chemo and regretted it</i></p>	<p><i>I have had friends who done have chemo and never regretted it</i></p>
<p>My uncle decided to try chemotherapy to extend his life hopefully. It worked, and he was not that sick most of the time.</p>	<p>My uncle decided to try chemotherapy to extend his life hopefully. It didn't work, and he was very sick most of the time.</p>
<p>My dearest friend chose chemo as a treatment, and this led to lower quality of life but had positive lasting effects.</p>	<p>My dearest friend chose chemo as a treatment, and this led to lower quality of life and did not have any positive lasting effects.</p>
<p><i>I know someone who had cancer and chose chemotherapy. It was tough, lots of good days and bad days, but it did not allow more time to be spent with family.</i></p>	<p><i>I know someone who had cancer and chose chemotherapy. It was tough, lots of good days and bad days, but allowed more time to be spent with family.</i></p>
<p>My sister is currently facing a terminal cancer situation. She chose a chemo treatment, which had no severe side effects. She wants to try and extend her life.</p>	<p>My sister is currently facing a terminal cancer situation. She chose a chemo treatment, which had severe side effects. She wants to try and extend her life.</p>

As in Study 3, participants' regulatory focus was manipulated. Participants listed their ideal goals in the promotion condition and listed their oughts in the prevention condition (Higgins et al., 1994). Then participants randomly received advice that either emphasized gains that a person could achieve (eagerness) or the losses a person could avoid (vigilance) by choosing chemotherapy:

Vigilance: While you were sharing your thoughts and concerns with your physician, she listened carefully and provided emotional support for you. She explained your disease progression, diagnosis, and prognosis. After all the information was on the table, your doctor tells you that chemotherapy helps to prevent the shorter quantity of your life. The doctor recommends you to choose this option because you will be able to avoid the worst results in your situation.

Eagerness: While you were sharing your thoughts and concerns with your physician, she listened carefully and provided emotional support for you. She explained your disease progression, diagnosis, and prognosis. After all the information was on the table, your doctor tells you that chemotherapy helps to promote longer quantity of your life. The doctor recommends you to choose this option because it will lead to gaining the best results in your situation.

All participants then imagined that they considered each option and decided to follow the advice. Participants reported their choice satisfaction, (post-advice) attitude toward chemotherapy and trust in physician expertise. Finally, participants answered several true/false questions to determine if they had misconceptions about chemotherapy, reported their demographics and read a disclosure note about fictitious nature of the comments at the beginning of the survey.

Measures.

Fit and non-fit conditions. Participants who were oriented in promotion focus and received advice that emphasized gains experienced regulatory fit. Those of them who received

advice emphasizing avoiding losses experienced regulatory non-fit. Participants who were oriented in prevention focus experienced regulatory non-fit receiving “gain” advice and regulatory fit receiving advice that emphasized avoiding losses.

Attitude change improvement. A five-item measure of the attitude was adjusted to assess attitude toward chemotherapy. For example, participants rated to what extent they agree with the following statements, “chemotherapy negatively changes people’s lives;” “chemotherapy positively changes people’s lives.” A continuous variables “initial attitude” ($\alpha = 0.86$, $M = 4.28$, $SD = 1.16$) and post-advice attitude ($\alpha = 0.86$, $M = 4.30$, $SD = 1.14$) were created by averaging five items pre- and post-advice measures (with one reversed). Attitude change improvement variable ($M = 0.02$, $SD = 1.11$) resulted from the subtraction of participants’ pre-advice attitude from their post-advice attitude toward chemotherapy. As in previous studies, more positive numbers indicated that participants’ attitude toward the recommended option (in this case, chemotherapy) became more positive after receiving the physician’s advice for it.

Choice satisfaction. Participants also reported their choice confidence, choice satisfaction, and commitment to the chosen chemotherapy option. These three items were rated on a 7-point Likert scale (1 = not at all to 7=very much). The items were averaged to create the variable “choice satisfaction” ($\alpha = .90$, $M = 4.29$, $SD = 1.71$).

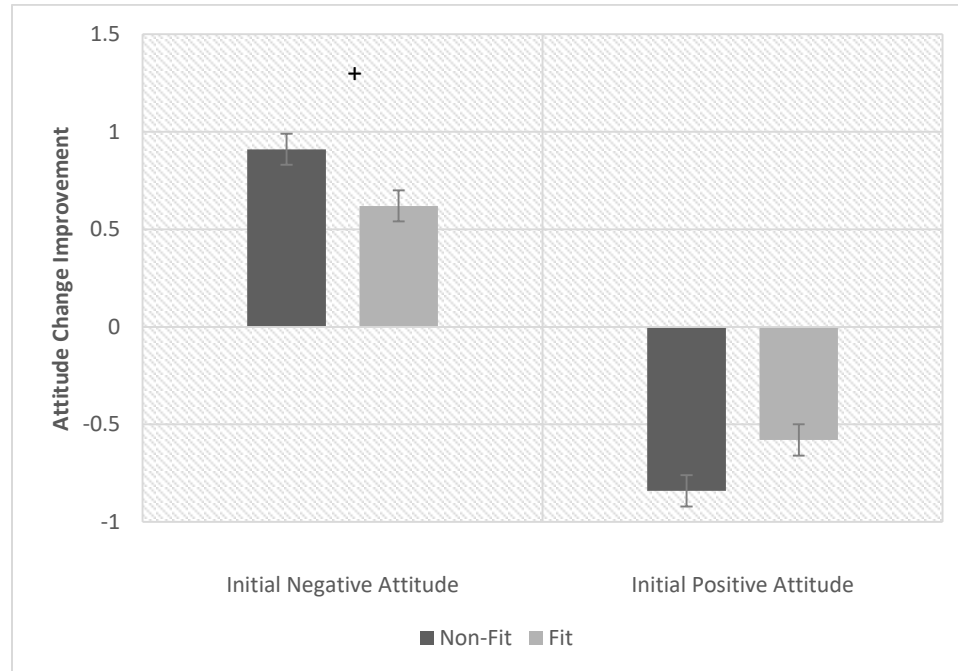
Results

Manipulation check. As expected, participants in the initially positive attitude condition had a significantly more positive initial attitude toward chemotherapy ($M = 4.82$, $SD = 0.73$) than participants in the initially negative attitude condition, $M = 3.75$, $SD = 1.25$, $t(153) = 6.15$, $d = 1.05$, $p < .001$ 95% CI [-6.99, -3.73].

Attitude change improvement. To explore the first hypothesis, the interaction 2(regulatory fit: fit; non-fit) x 2(initial attitude: negative; positive) was regressed on attitude change improvement using PROCESS procedure Model 1 (Hayes, 2013). As in previous studies with standardized choice, attitude change ($r^2 = .07, p < .01$) and choice satisfaction ($r^2 = .52, p < .001$) were highly correlated with trust in physicians' expertise. Trust in physician's expertise was included as a covariate in subsequent analyses. Unexpectedly, the interaction between initial attitude and regulatory fit was not significant, ($\beta = -0.14, t < 1$). However, given the prevalence of people who have received chemotherapy in the US population, I suspected that the manipulating attitudes might not equally influence the opinion of participants. The next analysis included an initial attitude that was measured after the attitude manipulation.

Internal analysis of attitude change improvement. The interaction 2(regulatory fit: fit; non-fit) x 2(initial measured attitude: negative; positive) was regressed on the dependent variable attitude change. As illustrated in Figure 8, the interaction between an initial attitude and regulatory non-fit was significant, $\beta = 0.24, t(150) = 2.14, p = .03, 95\% \text{ CI } [0.02, 0.47]$. A further analysis showed that participants who had a relatively strong initial negative attitude toward chemotherapy made it marginally less negative in the non-fit condition, $M_{\text{non-fit}} = 0.91, SD_{\text{non-fit}} = 1.06; \beta = -0.30, t = -1.62, p = .10, 95\% \text{ CI } [-0.67, 0.07]$, compared to the participants in the fit condition ($M_{\text{fit}} = 0.62, SD_{\text{fit}} = 1.00$). The opposite (non-significant) relationship was observed for participants with an initially positive attitude, $\beta = 0.27, t = 1.46, p = .14, 95\% \text{ CI } [-0.10, 0.63]$, with participants in the non-fit condition reducing their positive attitude toward chemotherapy slightly more ($M_{\text{non-fit}} = -0.84, SD_{\text{non-fit}} = 1.14$) compared to the participants in the fit condition ($M_{\text{fit}} = -0.58, SD_{\text{fit}} = 0.75$).

Figure 8: Attitude change improvement as a function of measured initial attitudes and having a fit or non-fit advice message for chemotherapy.



+ $p < .10$

Additional Analysis. The following 3-way interaction was explored 2(promotion; prevention) x 2(fit; non-fit) x (measured initial attitude). The interaction was not significant, $\beta = -0.37$, $t(147) = -1.36$, $p = .17$, 95% CI [-0.92, 0.17]. For participants in the prevention condition, the interaction was significant $\beta = 0.46$, $t(71) = 0.21$, $p = .04$, 95% CI [0.02, 0.91]. The relationships were consistent with the main hypothesis. In the prevention non-fit condition, participants made their attitude marginally less negative, $M = -0.97$, $\beta = -0.61$, $t = -1.72$, $p = .08$, 95% CI [-1.32, 0.10], compared to participants in the prevention fit condition ($M = 0.36$) if they had an initial negative attitude. The relationships were not significant for promotion non-fit/fit if participants had a negative or positive attitude.

Choice Satisfaction. The interaction 2(regulatory fit: fit; non-fit) x 2(initial measured attitude: positive; negative) was regressed on the variable choice satisfaction using PROCESS procedure Model 1 (Hayes, 2013). The effect of the interaction between non-fit and initial attitude on choice satisfaction was consistent with the main hypothesis but did not reach significance, $\beta = 0.20$, $t(150) = 1.19$, $p = .23$, 95% CI [-0.13, 0.54].

Discussion

Study 4 demonstrated relationships consistent with the hypotheses; participants with an initially negative attitude toward chemotherapy experienced greater attitude change improvement when they received advice in a non-fit (vs. fit) manner. As expected, the patterns of results observed if a passive option hospice care was recommended were similar to the patterns of results in this study in which an active chemotherapy option was endorsed. However, some difference in the results between these studies merits further discussion.

First, I observed a stronger effect of regulatory non-fit on attitude change improvement when the physician advised hospice care rather than chemotherapy. It is possible that, beyond what could be measured in the manipulation check, the recommendation for hospice care option might induce negative reactions that were stronger than those induced when the physician recommended chemotherapy. Hospice care might make patients uncomfortable and provoke strong emotional responses because it is closely related to thinking about dying (Seymour (Seymour, Gott, Bellamy, Ahmedzai, & Clark, 2004). On the other hand, chemotherapy could provide hope for a cure (Weeks et al., 2012). Consistent with this idea, participants' average initial negative attitude toward chemotherapy ($M_{neg.att} = 3.75$, $SD_{neg.att} = 1.25$) was higher than participant's initial negative attitude toward hospice ($M_{neg.att} = 3.48$, $SD_{neg.att} = 1.26$). More

important perhaps is the literature suggesting that participants tend to overestimate advantages of chemotherapy and underestimate advantages of hospice care (Seymour et al., 2004; Weeks et al., 2012). Again, this may decrease the impact of regulatory fit on attitude change improvement as the participants may already have a relatively positive attitude toward chemotherapy. Thus, more research is needed to determine the boundary conditions of regulatory non-fit effects as a function of the intensity of an initial attitude. The regulatory non-fit effect on attitude improvement should be greater for more emotionally negative advice.

Second, I observed the predicted effect only if independent variable included participants' measured initial attitude. There were no effects if the independent variable included the manipulated initial attitude. Possibly, it is more difficult to manipulate initial attitudes toward chemotherapy than attitudes toward hospice care. More people in the US had experience with chemotherapy than hospice care. Thus, many participants likely had at least some initial knowledge and an initial attitude toward chemotherapy. Consistent with this notion, it was observed that while 40% of participants had misconceptions about hospice care in the previous study, only 20% of participants had misconceptions about chemotherapy in this study. As a result, participants real life experiences with chemotherapy influence their initial attitude toward chemotherapy more than the study manipulation. While participants' attitudes were perhaps not driven sufficiently by the manipulation, the measure of the initial attitude taken after the manipulation captured well participants' initial attitudes.

Study 5: Attitude Change and Initial Involvement

In Study 5, I explored whether initial involvement will moderate effect of regulatory non-fit in the same way it moderates the effect of regulatory fit. I expected that regulatory non-fit

should work via two different mechanisms depending on participants' level of involvement. In this research, participants' real life experiences with cancer and hospice facilitate stronger involvement. On the contrary, lack of such experience makes participants less involved in the decisions that they make in the study. This conceptualization is consistent with the elaboration likelihood model of persuasion developed by Cacioppo and Petty (1984). The researchers suggested that involvement of participants in the evaluation depends on their previous knowledge about a discussed subject. Particularly, individuals are more likely to process information with high involvement if they could access relevant associations, images, and experiences from their memory, analyze the information in light of their prior knowledge and draw a conclusion based on the data extracted from their memory and the message. On the other hand, if individuals have a lack of prior relevant knowledge, they will be less involved in information processing and in evaluations because they will not be able to access relevant memories and therefore, will be less motivated to evaluate the message comprehensively (Wood, 1982). Thus, in this study, the participants have high involvement if they had experience with cancer and hospice and low involvement if they did not.

Similarly to the previous research by Avnet et al. (2013), I expected that participants with high involvement would feel more confident in their initial attitudes if they experienced regulatory fit and less confidence if they experienced regulatory non-fit. Therefore, to influence participants with high involvement and initially negative attitudes, advice should be framed in regulatory non-fit manner. In this case, participants will be less confident in their initial attitude and will be more open toward attitude change improvement than participants who received advice in a regulatory fit manner and become more confident in their initial attitude.

In contrast, participants with low involvement and initially negative attitudes will be more likely to transfer their feeling right or feeling wrong to the target option. As a result, if they have a negative attitude toward a recommended option, they will experience more attitude change improvement if they receive the physician's recommendation in a regulatory fit (vs. non-fit) manner. In sum, under high involvement, regulatory non-fit will be a more powerful tool for attitude change improvement (i.e., de-intensifying negative attitudes), while under low involvement regulatory fit would be more effective for attitude change improvement.

H1: The effect of the regulatory non-fit condition on attitude change improvement as a function of initial attitude will depend upon participants' level of involvement.

H1a: Individuals with high involvement will experience more attitude change improvement in the non-fit (vs. fit) condition (replicating the effect found in the previous studies).

H1b: Individuals with low involvement will experience more attitude change improvement in the fit (vs. non-fit) condition.

Methods

Participants. A total of 251 American Mechanical Turk workers ($M_{age} = 45$, $SD_{age} = 14$; 35% Male) were recruited for monetary compensation. Participants whose age is more than 50 years old were encouraged to participate in this study. Two outliers were deleted. Both were in the regulatory fit condition; one was in the high involvement condition and one in the low involvement. Their initial attitudes were more than three standard deviations below the mean. In addition, their attitude change improvement scores were three standard deviations higher than the other participants in their groups and more than four standard deviations higher than the

mean of the entire sample. Perhaps, the reason for this extreme attitude change improvement is a misreading of the scale, rather than the effect of the manipulation. Those outliers were deleted from the analysis. The 3-way interaction is borderline significant if those outliers are included in the analysis ($\beta = 0.77, p = .05$)

Procedure. Participants read the same script as in previous studies. They imagined being diagnosed with a terminal lung cancer and imagined having a choice between two options available to them: hospice or chemotherapy. Participants then reported their initial attitude toward hospice. At the next step, regulatory focus was manipulated using the procedure of Higgins et al. (1994). The instructions were designed to induce either promotion or prevention focus as in Studies 2-4. Upon completing this task, all participants received recommendations to enroll in hospice care. The advice emphasized either achieving gains or avoiding losses as in the Studies 2-4. After reading the advice, participants reported their attitude toward hospice care again. In the end, participants answered questions about their hospice experience and demographic questions.

Measures.

Regulatory Fit Non-fit Conditions. Regulatory fit and non-fit condition were assigned in a similar manner as in previous studies. Those participants who completed a promotion induction task experienced regulatory fit if they received advice that emphasized achieving gains and experienced regulatory non-fit if they received advice that emphasized avoiding losses. In turn, those participants who completed a prevention induction task experienced regulatory non-fit if they received advice that emphasized achieving gains and experienced regulatory fit if they received advice that emphasized avoiding losses.

Initial Involvement. Participants were assigned to the high versus low involvement conditions based on their self-reported experience with hospice care in the setting of cancer. 158 participants (34% Male, $M_{\text{age}} = 42.86$, $SD_{\text{age}} = 15$) had experience with both cancer and hospice care and were, therefore, assigned to the high involvement condition. 91 participants (42% Male, $M_{\text{age}} = 46$, $SD_{\text{age}} = 13$) did not have a joined experience of observing someone with cancer and on hospice care, and they were assigned to the low involvement condition.

Initial attitude. A categorical measure of initial attitude was created by subtracting the scores of the negatively worded item from the scores of the positively worded item that were administered at the beginning of the survey. 190 participants had positive scores on this variable and were assigned to the initial positive attitude condition ($M = 5.70$, $SD = 0.74$); 59 participants had negative scores on this variable and were assigned to the initial negative attitude condition ($M = 3.73$, $SD = 0.98$).

Attitude change improvement. Averaging scores of five items designed to assess attitude toward hospice resulted in two variables: Initial attitude ($\alpha = .86$, $M = 5.19$, $SD = 1.22$) and Post-advice attitude ($\alpha = 0.88$, $M = 5.43$, $SD = 1.09$). As in previous studies, a continuous measure of “attitude change improvement” was created by subtracting participants’ initial attitude toward hospice from their post-advice attitude toward it ($M = 0.27$, $SD = 0.73$). In this scale, more positive numbers indicate that participants’ attitude became more positive after receiving the physician’s advice.

Results

Attitude change improvement and involvement. To explore whether involvement moderates the relationship between the regulatory fit condition and attitude change, a 3-way interaction 2 (Regulatory Fit: fit; non-fit) x 2 (initial attitude: negative; positive) x

2(involvement: low; high) was regressed on the variable attitude change improvement. As shown in Table 3, the interaction was not significant, $\beta = 0.56$, $t(241) = 1.58$, $p = .12$, 95% CI [-0.13, 1.22], observed power = .35. As expected, for participants with low involvement, there was a marginally significant interaction between the regulatory fit condition and initial attitude on attitude change improvement, $\beta = -0.66$, $t = -1.88$, $p = .06$, 95% CI [-1.34, 0.03]. It suggested that participants' initial negative attitude was less negative in the *fit* condition as expected. For people with high involvement, there was no significant interaction between regulatory fit condition and initial attitude ($\beta = -0.06$, $t < 1$). Perhaps, this study is underpowered due to a low sample size in the group of participants who had initial negative attitudes, see Table 4.

Table 4: Attitude change as a function of involvement, regulatory non-fit, and initial positive and negative attitudes.

		Initial Attitude			Attitude Change		
		Mean	N	Std. Deviation	Mean	N	Std. Deviation
Low involvement							
Negative Attitude	Non-Fit	3.91	15	1.10	0.23	15	0.67
	Fit	3.51 (3.36) ^a	13	0.92(1.05)	0.64 (1.00)	13	0.70 (1.49)
Positive Attitude	Non-Fit	5.56	33	0.73	0.25	33	0.45
	Fit	5.43	30	0.68	0.19	30	0.43
High involvement							
Negative Attitude	Non-Fit	3.50	12	1.19	0.60	12	0.76
	Fit	4.01 (3.86) ^a	19	0.79 (1.02)	0.46 (0.59)	19	0.71 (0.90)
Positive Attitude	Non-Fit	5.70	67	0.77	0.15	67	0.59
	Fit	5.92	60	0.70	0.08	60	0.47

^aIn parentheses, there are results for the sample which includes two participants who change their attitude from a very negative to a very positive attitude. I analyze data without these two outliers.

Internal meta-analysis. Given the low power of previous analysis due to imbalanced groups, the data from Study 2 was combined with this data set to boost the statistical power and achieve a more precise estimation (Cumming, 2013). As noted above, although I attempted to recruit only individuals with hospice experience in Study 2, there were 42 individuals who filled out the survey and failed to confirm their experience with hospice. Therefore, those individuals were classified as low involvement participants and, thus, Studies 2 and 5 were virtual replications of each other. First, an attitude change was standardized within each study and then aggregated into one dataset (N = 562, see Table 5).

To explore whether involvement moderates the relationship between regulatory non-fit condition and attitude change, the same 3-way interaction 2(Regulatory fit: fit; non-fit) x 2(initial attitude: negative; positive) x 2(involvement: low; high) was conducted. With this increase in power, the 3-way interaction was significant, $\beta = 1.16$, $t(555) = 3.04$, $p < .01$, 95% CI [0.41, 1.91], observed power = .86, indicating that the effect of the regulatory fit condition and the initial attitude condition on attitude change differ as a function of involvement. Consistent with the predications and the results of previous studies, for participants with high involvement, there was a significant interaction between regulatory non-fit and initial attitude on attitude change improvement, $\beta = 0.44$, $t = 2.11$, $p = .04$, 95% CI [0.03, 0.84]. For participants with an initially negative attitude, participants had more attitude change improvement in the *non-fit* condition ($M_{non-fit} = 0.62$, $SD_{non-fit} = 1.07$) compared to the fit condition ($M_{fit} = 0.21$, $SD_{fit} = 1.01$; $\beta = -0.41$, $t = 2.25$, $p = .03$, 95% CI [-0.77, -0.05]). For participants with low involvement, there was also a

significant interaction between regulatory non-fit and initial attitude on attitude change, $\beta = -0.72$, $t = -2.26$, $p = .02$, 95% CI [-1.36, -0.09]. As expected, in the initial negative attitude condition, participants had more attitude change improvement in the *fit* condition, $M_{fit} = 0.67$, $SD_{fit} = 1.03$; $\beta = -1.06$, $t = -4.13$, $p < .001$, 95% CI [-1.57, -0.55], compared to the non-fit condition ($M_{non-fit} = -0.10$, $SD_{non-fit} = 0.88$). There were no significant relationships in high or low involvement conditions for participants with initial positive attitude.

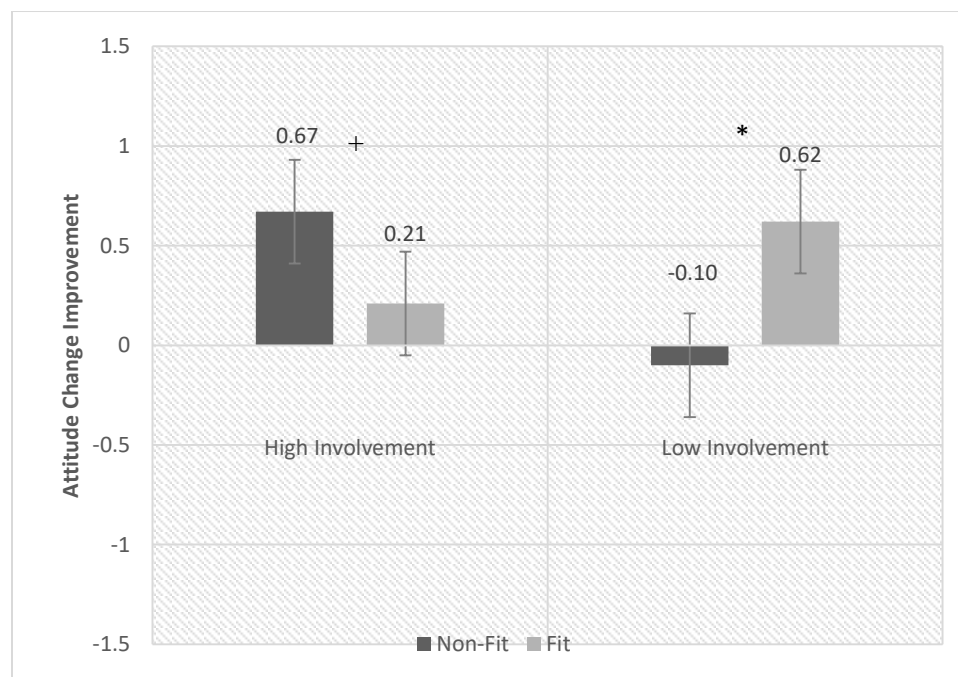
The following analysis included only participants with a negative attitude (n = 138). It demonstrates that the following interaction 2(Regulatory fit: fit; non-fit) x 2(involvement: low; high) was significant, $\beta = -1.18$, $t(134) = 3.23$, $p < .01$, 95% CI [-1.91, 0.46] confirming a moderation effect of involvement (see Figure 9).

Table 5: Attitude change as a function of involvement, regulatory non-fit, and initial positive and negative attitude (meta-analysis).

		Initial Attitude			Attitude Change		
		Mean	N	Std. Deviation	Mean	N	Std. Deviation
Low involvement							
Negative Attitude	Non-Fit	3.5	25	1.15	0.24	25	0.63
	Fit	3.35	21	0.79	0.79	21	0.74
Positive Attitude	Non-Fit	5.52	47	0.71	0.21	47	0.5
	Fit	5.42	40	0.71	0.24	40	0.46
High Involvement							
Negative Attitude	Non-Fit	3.67	43	0.94	0.59	43	0.68
	Fit	3.96	49	0.94	0.34	49	0.67

Positive Attitude	Non-Fit	5.72	160	0.74	0.09	160	0.58
	Fit	5.75	178	0.79	0.1	178	0.53

Figure 9: Attitude change improvement toward hospice as a function of initial involvement, whether physicians' advice was given in a regulatory fit (vs. non-fit) manner for participants with initial negative attitude (n = 134).



+ $p < .10$; * $p < .05$, Standardized values are reported.

Discussion

Aggregating data across two studies, I found that the effects of regulatory fit and non-fit on attitude change improvement differed as a function of participants' initial involvement. For participants with high involvement, I replicated the previous findings in Studies 2-4; that is, participants with initially negative attitudes experienced greater attitude change improvement

when they received advice in a non-fit (*vs.* fit) manner. In contrast, for participants with low involvement, participants with initially negative attitudes experienced greater attitude change improvement when they received advice in a fit (*vs.* non-fit) manner. These results are generally consistent with the findings of Avnet et al. (2013) for regulatory fit. Unlike the Avnet et al. (2013) studies, in this study, I used previous knowledge of individuals as a proxy of involvement. This approach is consistent with the conceptualization and methods of Cacioppo and Petty (1984). Nonetheless, future studies should explore the difference between involved and uninvolved participants by manipulating relevance, importance or personal consequences of the decisions as other studies have also done. While this study delineates the difference between individuals who are familiar with cancer and hospice care and those who do not, the study still is hypothetical as it asks healthy individuals to imagine having a cancer diagnosis and then make choices. A key limitation is that reactions of healthy individuals might differ from those who actually have been diagnosed with cancer. To address this limitation, I collected further data in a cancer center.

Study 6a: Data Collection among Hospitalized Patients

Patients admitted to the hospital at a cancer center participated in the study. They received similar decision-making vignettes as participants in previous studies. For this study, it was decided to measure participants' promotion and prevention focus rather than manipulate. The goal was to explore whether advice could be adjusted to patients' own motivational orientations. The following hypotheses were tested:

H1: Attitude change improvement will be affected by the interaction between initial attitudes and the regulatory fit/non-fit conditions.

H2: For those participants who have a more negative attitude toward hospice, framing advice in a regulatory non-fit manner will facilitate positive attitude change (attitude improvement) more than the framing advice in a regulatory fit manner.

Methods

Participants. Patients who had active cancer at various stages and were hospitalized in a New York Cancer Center were recruited for the study. The exclusion criteria were: non-fluent English, mental or physical inability to complete the survey, and acute emotional distress. 120 patients were invited to complete the survey. A total of 65 patients declined to participate in a survey, due to feeling fatigue and pain. Another 14 patients declined to participate after the researcher explained that they need to think about end-of-life decisions. The number of completed surveys was 36 (4 were partially completed). This study included the following demographic: 64% of participants were younger than 65 years; 56% male; 82% were White, 6% African-American, 6% Asian, 6% Hispanic; 65% of participants had a college education; 51% of participants reported observing someone being on a hospice care program.

Procedure. The patients, who agreed to participate, filled in a paper-pencil survey. Participants were informed that they did not have to answer any questions that make them feel uncomfortable. First, Participants' individual regulatory focus was measured using the well-established Regulatory Focus Questionnaire (Higgins et al., 2001). Participants then read a vignette about a patient having advanced cancer with a short-life prognosis, the same as in previous studies. The patient in the script was offered two options. Option A involved chemotherapy and Option B involved discontinuing chemotherapy and enrolling in a hospice care program. After participants read the script, their attitudes toward hospice care were measured. Participants also learned that the physician recommended hospice care to the patient

in the script. The physician's advice was randomized as follows: half of the participants read physician's advice that emphasized achieving gains, whereas the other half of the participants read physician's advice that emphasized avoiding losses. Participants attitudes toward hospice care were measured again. Finally, they provided their knowledge about hospice, quality of care if they observed anyone being on hospice, and answered demographic questions.

Measures

Initial Attitude. Five questions measured participants' attitudes toward hospice. Participants reported their agreement with the statements such as "hospice helps people to manage things" on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). Higher scores indicate more positive attitudes toward hospice. First, these items were administered after participants read the script but before they received a physician's advice and averaged (with one reversed item) in a continuous variable "initial attitude toward hospice" ($\alpha = .86$, $M = 5.00$, $SD = 1.27$). The same five items were administered after advice was provided. Participants' answers were averaged (with one reversed item) in a continuous variable "post-advice attitude" ($\alpha = .90$, $M = 5.29$, $SD = 1.10$). The dependent variable "attitude change improvement" was created by subtracting participants' "initial attitude toward hospice" from their "post-advice attitude toward hospice" ($M = 0.29$, $SD = 0.82$). More positive numbers on this variable indicated that participants' attitudes became more positive after receiving the physician's advice.

Individual regulatory focus. The RFQ is an 11-item measure that captures participants' trait orientations toward prevention (focusing on maintaining non-losses) or promotion (focusing on attaining gains). Participants rated their history of promotion and prevention successes and failures on 5-point scales from 1 (never or seldom) to 5 (very often). Promotion scores were created by averaging the six items that measured participants sensitivity to attaining gains, such

as the “I feel like I have made progress toward being successful in my life” ($M_{promotion} = 23.58$; $SD_{promotion} = 2.90$), whereas prevention scores were created by averaging the 5 items that measured participants sensitivity to maintaining non-losses, such as the item “Not being careful enough has gotten me into trouble at times” ($M_{prevention} = 17.52$; $SD_{prevention} = 3.37$). In this sample, the Cronbach alfa was low: promotion 0.52 and prevention 0.74. The RFQ scale was validated in multiple studies including the studies with patients who faced difficult choices (Uskul, Keller, & Oyserman, 2008). Therefore, lower than usual alfa could have resulted from a smaller sample size.

Regulatory fit and non-fit. To determine fit and non-fit conditions, a single variable that captured regulatory focus predominance was created as in Study 1. A difference score was calculated by subtracting individuals’ prevention scores from their promotion scores. According to Higgins et al. (2001), individuals with positive difference scores are classified as predominantly promotion-focused whereas individuals with negative difference scores are classified as predominantly prevention-focused. In this data, only one participant scored below zero. This suggests that promotion-focused patients admitted to the hospital were more likely to complete the survey than prevention-focused patients. The participants, then, varied in how strongly they were predominantly promotion-focused, and the advice for hospice care that emphasized avoiding losses created a regulatory non-fit whereas the advice that emphasized achieving gains created a regulatory fit.

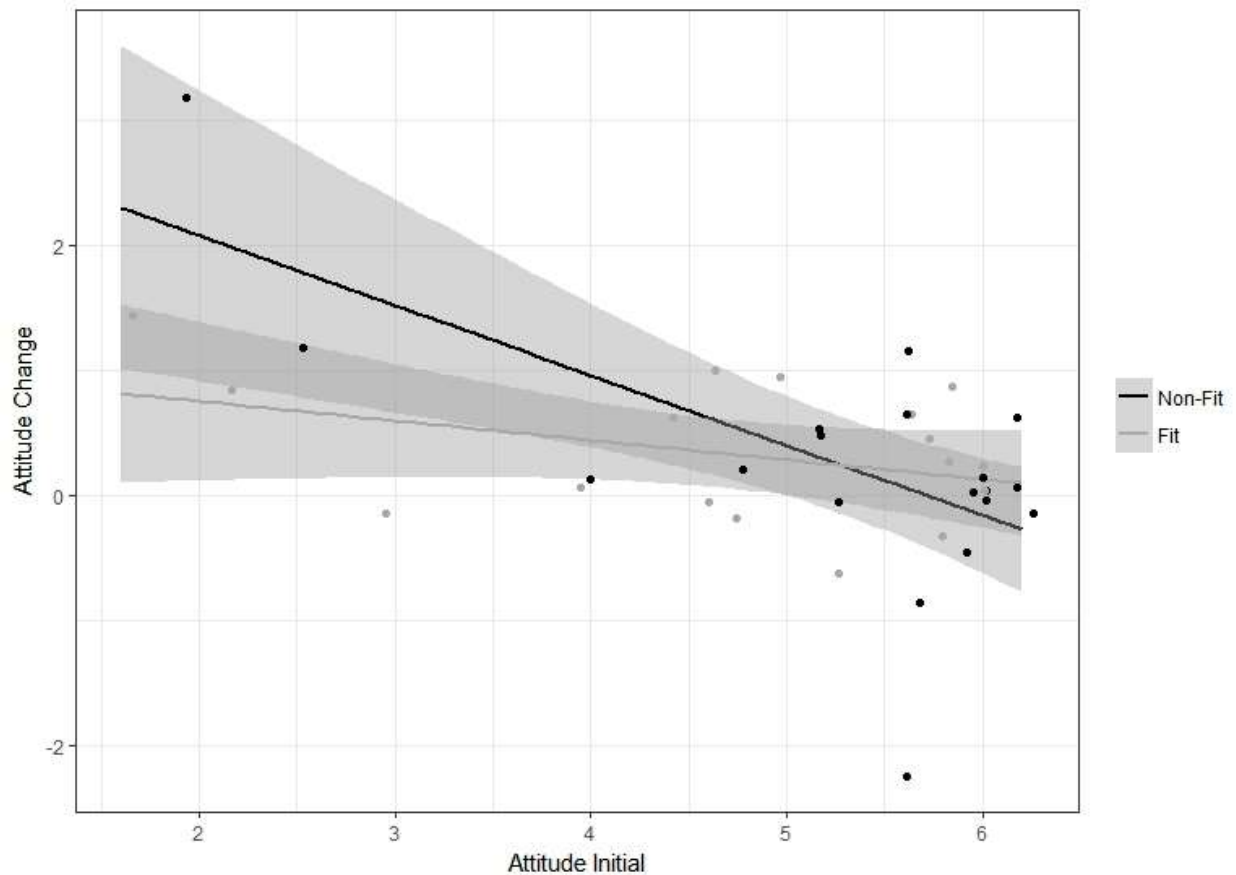
Results

Attitude. A repeated measure analysis was used to compare attitudes toward hospice care of participants before and after they received the physician’s recommendation for hospice care. Overall, participants improved their attitudes toward hospice care significantly after

receiving the physician's recommendation for hospice care, $M_{initial} = 5.00$, $SD_{initial} = 1.27$; $M_{post-advice} = 5.29$, $SD_{post-advice} = 1.10$, $F(35, 1) = 4.39$, $p = .04$). The demographic characteristics, knowledge about hospice care, and previous experiences of observing someone on hospice care were uncorrelated with the dependent variable attitude change improvement.

To test the central hypothesis, the interaction between initial attitude and the regulatory fit/non-fit conditions was regressed on attitude change using a linear regression in R software. As expected, and shown in Figure 10, there was a significant interaction, $b = 0.40$, $s.e. = 0.19$, $t(32) = 2.15$ $p = .04$, 95% CI [0.02, 0.79], reflecting the fact that there was an advantage of framing advice in a regulatory non-fit manner (vs. fit manner) when participants experience an initial negative attitude. The association between an initial more negative attitude and attitude improvement was significant for those who were in the regulatory non-fit condition, $b = -0.34$, $s.e. = 0.10$, $t = -3.53$ $p < .01$, 95% CI [-0.90, -0.22] but it was not significant for those who were in the regulatory fit condition, $b = -0.16$, $s.e. = 0.10$, $t = -1.57$ $p = .13$, 95% CI [-0.37, 0.06]. Specifically, and consistent with expectations, for those participants with more negative initial attitudes, there was more improvement in their attitude, in the non-fit condition than in the fit condition. Whereas for those participants with more positive initial attitudes there was little change in either the fit or non-fit condition.

Figure 10. Attitude change as a function of measured initial attitudes and having a non-fit or fit advice message.



Discussion

The results among people who have active cancer replicated previous findings of behavioral laboratory experiments, suggesting that regulatory non-fit experience could reduce patients' negative reactions to unpleasant advice. However, the fact that no predominantly prevention-oriented patients participated in the study, and the lower than normal Cronbach alphas for the promotion and prevention measures, are limitations. To ensure presence both promotion focused, and prevention focused participants, patients' regulatory focus was manipulated in the next study.

Study 6b: Data Collection among Patients (clinics)

In this study, a different methodology for creating a regulatory non-fit experience was used. Regulatory focus was experimentally manipulated by using a standard, a well-validated method of priming promotion or prevention focus before delivering advice. This experimental approach could provide a practical insight on how physicians could create a regulatory non-fit experience without needing to assess patients' chronic motivational focus.

Methods

Participants. Patients who had active cancer at various types/stages and visited palliative clinics in a New York cancer center were invited to participate in this study. The exclusion criteria were the same as in Study 1. Among 93 participants, 10 participants declined to take the survey after a researcher explained the purpose of the study. A group of 41 agreed to take a look at the survey later the same day but did not return the survey or returned it partially completed. The resulting number of completed surveys was 42. This study included the following demographic: 60% of participants were younger than 65 years old; 39% male; 70% were White, 22% African-American, the other 8% included Asian, Hispanic and others; 65% of participants had a college education; 52% of patients reported observing someone being in hospice care.

Procedure. After participants had completed a conversation with their physician, they were invited to take a survey. The procedure of this study was identical to Study 6b, with an exception. Before providing a recommendation for hospice care, participants' regulatory focus (promotion; prevention) was experimentally manipulated using the standard method of Higgins et al. (2001). In the promotion condition, participants reported instances when they felt progress toward achieving goals whereas participants in the prevention condition reported instances when

they avoided losses. Upon completing this procedure, participants read the script in which they imagined a choice between chemotherapy and hospice care. Then they were informed that the patient in the script received a recommendation to discontinue cancer treatment and enroll in a hospice care program. The physician's advice was randomized as in previous studies: half of the participants read advice that emphasized achieving gains. Whereas the other half of the participants read advice that emphasized avoiding losses.

Measures

Attitude. Attitudes toward hospice were measured before and after the physician's advice was provided using the same items as in Study 6a. Items were averaged (with one reversed) into two variables: "initial attitude toward hospice" ($\alpha = .93$, $M = 5.00$, $SD = 1.44$) and "post-advice attitude" ($\alpha = .91$, $M = 5.19$, $SD = 1.28$). The dependent variable "attitude change" was created by subtracting participants' "initial attitude toward hospice" from their "post-advice attitude toward hospice" ($M = 0.19$, $SD = 0.72$).

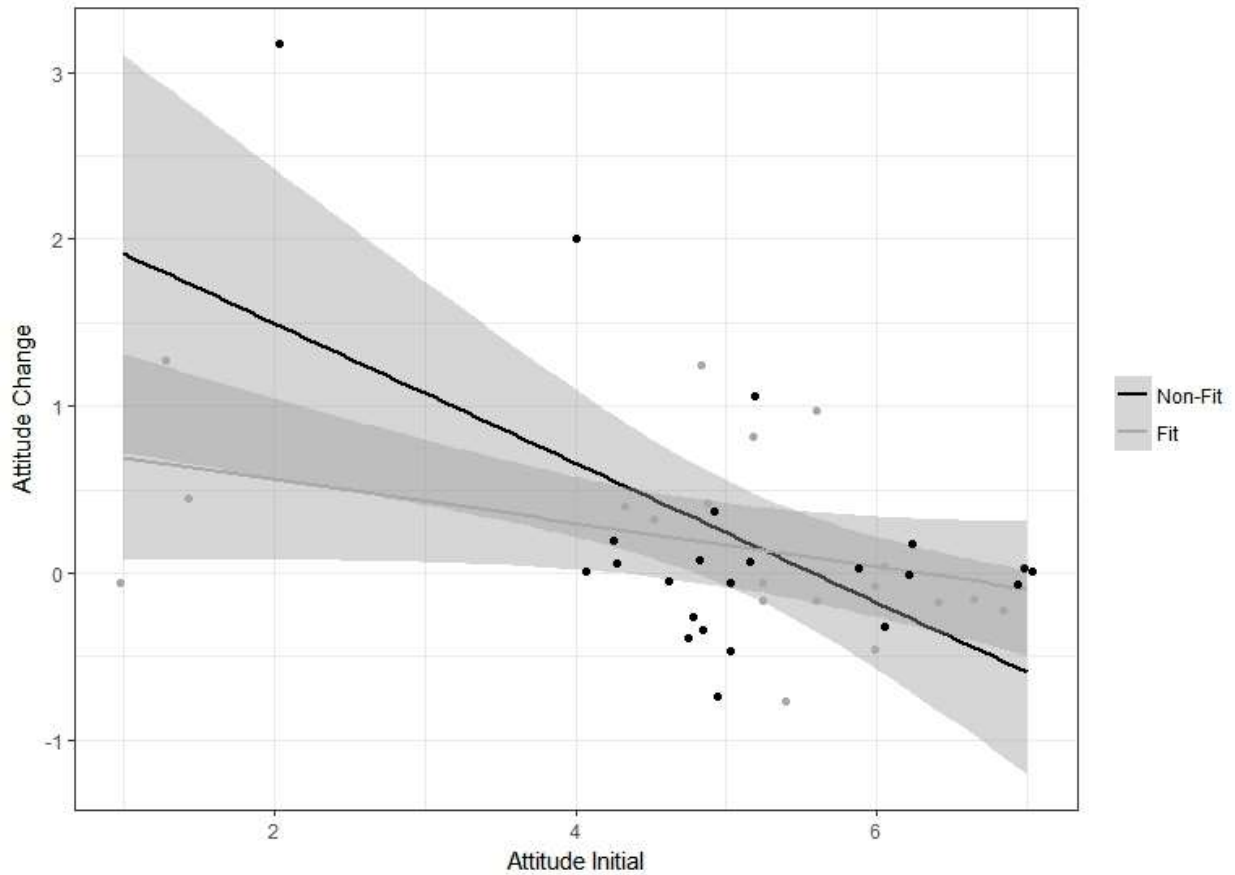
Fit and non-fit conditions. Those participants who were oriented to think about achieving gains (promotion-focused) experienced regulatory fit if they received advice that emphasized achieving gains and regulatory non-fit if they received advice that emphasized avoiding losses. In contrast, those participants who were oriented to think about avoiding losses (prevention-focused) experienced regulatory non-fit if they received advice that emphasized achieving gains and regulatory fit if they received advice that emphasized avoiding losses. As in previous studies, promotion and prevention fit were collapsed in the same condition as well as promotion and prevention non-fit.

Results

Attitude. A repeated measure procedure was used to compare attitudes toward hospice before and after advice was provided. Participants improved their attitudes marginally as a result of the physician's advice ($M_{\text{initial}} = 5.00$, $SD_{\text{initial}} = 1.44$ $M_{\text{post-advice}} = 5.19$ $SD_{\text{post-advice}} = 1.48$), $F(41, 1) = 2.92$, $p = .095$. The demographic characteristics, knowledge about hospice care, and previous experiences of observing hospice care were uncorrelated with the attitude change dependent variable.

To check the hypothesis, the interaction initial attitude and regulatory fit/non-fit conditions was regressed on attitude change using linear regression in R. The interaction was marginally significant, $b = 0.28$, $s.e. = 0.15$, $t(38) = 1.98$ $p = .058$, 95% CI [-0.00, 0.58] consistent with what was found in Study 6b. As shown in Figure 11, the association between having a more negative initial attitude and attitude improvement was significant for those in the regulatory non-fit condition, $b = -0.23$, $s.e. = 0.07$, $t = -3.21$ $p < .01$, 95%CI [-0.70, -0.14], but was not significant for those who were in the regulatory fit condition, $b = -0.13$, $s.e. = 0.07$, $t = -1.89$ $p = .08$, 95%CI [-0.27, 0.02]. Once again, consistent with expectations, for those participants with more negative initial attitudes, there was more improvement in their attitude, in the non-fit condition than in the fit condition. Whereas for those participants with more positive initial attitudes there was little improvement in either the fit or non-fit condition.

Figure 11. Attitude change as a function of measured initial attitudes and having a non-fit or fit advice message



Discussion

Framing information in a regulatory non-fit manner de-intensified patients' initial negative attitudes more than framing information in a regulatory fit manner. The reduction of negative reactions could lead to more thorough information processing when a decision needs to be made. Therefore, if a frightening or unpleasant option needs to be discussed, the application of regulatory non-fit in medical communication could enhance patients' ability to make well-informed decisions.

It is important to note that in both studies, I approached people with serious illnesses. A proportion of patients declined to participate in the study due to their physical weakness, inability to concentrate, or their busy schedules of medical appointments. As a result, the sample sizes in both studies were limited. However, the results of the two studies, with one measuring regulatory focus and one *manipulating* regulatory focus, were consistent with one another, and they replicate the findings in laboratory studies with healthy individuals. Altogether, this provides strong evidence that the regulatory non-fit intervention can be effective in medical communication for patients who are influenced by their strong negative reactions to a recommended option.

Chapter 4: Regulatory Non-Fit and Advice for Early Stage Cancer.

In this chapter, I explore whether the effect of regulatory non-fit could be generalized beyond hospice discussions. The experiment in this chapter focuses on the context of choosing treatment or non-treatment for prostate cancer at an early stage. The same general issue is investigated; specifically, how to provide advice for an unpleasant or frightening option in a way that reduces negative reactions toward a recommended option.

The diagnosis of cancer not only induce major stress, it also requires patients to deal with multiple choices. They must weigh the costs and benefits of treatment options, comparing the length of survival, toxicity, treatment impact on quality of life and functional status (Reyna et al., 2015). To do so, patients have to clearly understand the physical processes that are caused by their disease, effects of treatments as well as accept their physical body decline and the possibility of their own death (Drought & Koenig, 2002). Physicians' help and support are critical in these decisions. However, as in the case of end-of-life discussions, physicians face the question of how to advise the best course of action if patients dislike a beneficial option.

Physician-Patient Communication about Cancer Surveillance

In the case of prostate cancer, which is a slow growing tumor, patients usually choose between two distinct actions: to actively treat it or keep it under surveillance. Surveillance requires patients regularly undergo blood tests and biopsies. The treatment options include surgery, radiotherapy, hormone therapy, or chemotherapy. The active treatments are associated with side effects that include erectile dysfunction (impotence), urine incontinence, and bowel movement issues. The surveillance of cancer does not have these immediate complications, but there is a chance that cancer could spread out of the prostate and impact effectiveness of the future treatments (Cooperberg, Carroll, & Klotz, 2011). As a result, fear of worsening the cancer

condition is the main reason to reject surveillance (van den Bergh et al., 2009) This fear might cause men with low and intermediate cancer to feel more psychologically comfortable pursuing treatment even though it causes significant side effects that affect their functional states and their social lives (Fagerlin, Zikmund-Fisher, & Ubel, 2005). I propose to use the insights derived from regulatory non-fit theory to frame advice for patients in a way that reduces the influence of their cancer anxiety on their choice.

Study 7: A Regulatory Fit-Non-Fit Advice Message for Cancer Surveillance

The purpose of this study was to conceptually replicate and generalize the findings of Chapter 3. Given that the previous literature suggests that cancer anxiety and fear were the main reasons to reject advice for surveillance (van den Bergh et al., 2009), Study 7 explored the effect of regulatory non-fit on attitude change and anxiety. Particularly, I proposed that regulatory non-fit would reduce cancer anxiety and make participants more open toward surveillance, which would be an offered option in this study.

The following hypothesizes are tested:

H1: For participants with an initial negative attitude, there will be a stronger attitude change improvement for participants in the non-fit condition compared to the fit condition.

H2: Participants, experiencing regulatory non-fit will experience less cancer anxiety

Methods

Participants. A total of 218 male participants completed the survey for a monetary compensation at Mturk. I invited participants who are older than 45 years, as men are

recommended to undergo screening for prostate cancer around this age ("American Cancer Society recommendations for prostate cancer early detection," 2015). I excluded 4 participants who did not answer the question about their gender and 4 participants who reported female gender. Answers of 210 participants were included in the analyses (100% Male, $M_{age} = 52.16$, $SD = 7.46$).

Procedure. Upon entering the survey, participants read about prostate cancer and imagined being diagnosed with prostate cancer. The instructions suggested that prostate cancer has a 20% chance to spread outside the prostate. Participants received information about possible treatment for prostate cancer including surgery, radiotherapy or chemotherapy. I also informed participants about adverse effects of treatment on erectile, urinary, and bowel movement functions. Participants learned that since they have a relatively low likelihood of spreading cancer, they might not treat it but choose surveillance instead. It includes regular blood tests and occasional biopsies to monitor for signs of the cancer growth. Upon reading, participants reported their cancer anxiety (anxiety measure 1) and their attitude toward the surveillance option (pre-advice attitude measure). Participants then completed either promotion focus induction or prevention focus induction. They listed their aspirational goals to induce promotion focus or their ought goals to induce prevention focus Higgins et al. (1994). At the next step, a physician in the script recommended to all participants to choose the surveillance of prostate cancer. The advice was randomly assigned as follows: half of the promotion and prevention-oriented participants received the advice that emphasized gains. In this condition, participants read the following:

Your doctor listens to you carefully and provides emotional support. He reviews your disease progression, diagnosis, and available options. He reminds you that your two

main treatment options are an active treatment (with surgery or radiation) or active surveillance. After all the information is on the table, your doctor tells that active surveillance helps to promote a higher quality of life. The doctor recommends that you choose this option because active surveillance will allow you to achieve the best results in your situation.

The other half of the participants received the advice that emphasized avoiding losses. In this condition, participants read the following:

Your doctor listens to you carefully and provides emotional support. He reviews your disease progression, diagnosis, and available options. He reminds you that your two main treatment options are an active treatment (with surgery or radiation) or active surveillance. After all the information is on the table, your doctor tells that surveillance helps to prevent a lower quality of life. The doctor recommends that you choose this option because active surveillance will allow you to avoid the worst results in your situation.

Participants then were informed that they had considered the physician advice and had decided to follow it. They then completed the second measure of anxiety (post-advice anxiety) and post-advice attitude toward surveillance. Since participants did not have an actual choice but rather were informed that they chose surveillance, I assessed trust in the physicians' expertise. In the end, participants reported their demographics and were thanked and compensated.

Measures

Regulatory Fit and Non-Fit Conditions. Regulatory fit was created through the combination of the regulatory goal orientation manipulation and advice framing. Those

participants for whom prevention focus was induced were assigned to the fit condition if they received advice that emphasized avoiding losses and to the non-fit condition if they received advice that emphasized achieving gains. Those participants for whom promotion focus was induced were assigned to the fit condition if they received advice that emphasized achieving gains and to the non-fit condition if they received advice that emphasized avoiding losses.

Attitude Change Improvement. I used six questions to assess participants' attitudes toward the surveillance of prostate cancer before they received advice for surveillance and right after. Participants rated their agreement with the statements on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree): I believe that surveillance makes people's lives better; I believe that surveillance makes people's lives worse. The factor analysis indicated that one question had a very low correlation with all other statements: "Doing nothing if you have cancer is the wrong choice." In the pre-advice measure, this item had a correlation coefficient ($r = -.23$), while all other statements had a correlation that was three times stronger ($r > .60$). In the post-advice attitude measure, all other statements also had a strong correlation ($r > .70$), while the item "Doing nothing..." had a correlation coefficient ($r = -.20$). The low correlation of this item could be explained by the fact that "doing nothing" participants might interpret as doing neither treatment nor surveillance. Therefore, for the analysis below, I excluded this item from the scale. The items of the pre-advice attitude measure were averaged in the variable pre-advice attitude ($\alpha = .90$), and the items of post-advice attitude measure were averaged in the variable post-advice attitude ($\alpha = .85$).

The attitude change improvement variable was created by subtracting the mean scores of the pre-advice attitude measure from the post-advice attitude measure. More positive numbers on this variable reflect greater improvement of the attitude toward surveillance.

Initial Attitude toward surveillance. Two items on the pre-advice attitude measure were used to create a categorical variable “initial attitude toward surveillance.” The scores on the item that measured a negative attitude toward surveillance: “I believe that active surveillance makes people’s lives worse.” were subtracted from the scores of the item that measured a positive attitude toward surveillance “I believe that active surveillance makes people’s lives better.” The positive scores on the variable “initial attitude toward surveillance” indicated the group of people with an initial positive attitude toward surveillance and included 75% (n=157) of participants, while the negative scores indicated the group of people with an initial negative attitude toward surveillance and included 25% (n =53) of participants.

Anxiety measure. To measure cancer anxiety, I used the cancer anxiety scale which is a validated measure adopted from the memorial anxiety scale for prostate cancer Roth et al. (2003). The wording of the questions on the scale was not changed. Only questions about the PSA test itself were deleted. The scale was divided into two sets. Six questions were randomly chosen for the first set, the rest of the questions were included in the second set. The first set (time 1 measure) was administered after participants imagined having prostate cancer. The items were averaged into variable pre-advice anxiety ($\alpha = .84$). The second part (time 2 measure) was administered after participants received advice and were told that they chose surveillance. The items were averaged into the variable post-advice anxiety ($\alpha = .89$). The variable anxiety reduction was created by subtracting scores of the post-advice anxiety from the pre-advice anxiety. More positive scores indicated more anxiety reduction.

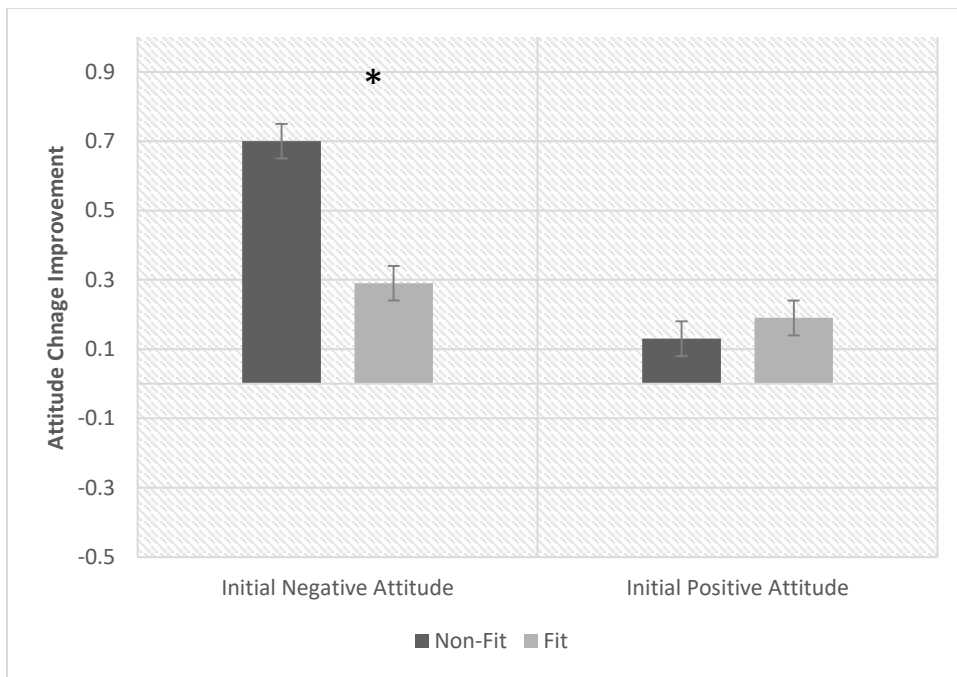
Results

Attitude change improvement. The analysis of the attitude change improvement, as expected replicated the findings of Chapter 3. Using the bootstrapping Model 1 (Hayes, 2013),

the following analysis was conducted: 2 x 2 interaction of (initial positive attitude; initial negative attitude) by the experimental conditions (fit; non-fit), on the dependent variable of attitude change improvement. Participants did not have a choice but rather were told that they followed the physician's advice. The covariate trust in physician expertise was added to this analysis. There was a main effect of an initial attitude, $\beta = -0.58$, $t(205) = -3.64$, $p < .001$, 95% CI = [-0.89, -0.26], suggesting that participants with a negative attitude toward surveillance improved their attitude significantly more. There was a main effect of the fit/non-fit conditions, $\beta = -0.42$, $t(205) = -2.38$, $p = .02$, 95% CI = [-0.76, -0.07] indicating that in the non-fit condition participants significantly improved their attitude more than in the fit condition. As expected, the interaction between an initial attitude (positive; negative) and regulatory fit (fit; non-fit) on attitude change improvement was significant, $\beta = 0.48$, $t(205) = 2.36$, $p = .02$, 95% CI = [0.08, 0.88]. Central to the hypothesis and shown on Figure 12, the analysis revealed that participants who had an initial negative attitude toward surveillance changed it significantly more in the non-fit condition, $M = 0.70$, $SD = 0.95$, $\beta = -0.42$, $t = -2.38$, $p = .02$, 95% CI = [-0.76, -0.07], than in the fit condition ($M = 0.29$, $SD = 0.81$). Moreover, in the non-fit condition, participants who had a negative attitude toward surveillance improved it significantly more ($M = 0.70$, $SD = 0.95$) than participants who had a positive attitude, $M = 0.13$, $SD = 0.46$, $\beta = -0.58$, $t = -3.64$, $p < .001$, 95% CI = [-0.88, -0.26]. In the initial positive attitude condition, there was no significant difference between the fit ($M = 0.19$, $SD = 0.65$) and non-fit conditions, $M = 0.13$, $SD = 0.46$, $\beta = 0.06$, $t = 0.60$, $p = .55$, 95% CI = [-0.14, 0.26]. Further, I ran the same analysis as above with a continuous measure of initial attitude (which was created based on 2 items). The results replicated the findings above, $\beta = 0.08$, $t(205) = 2.247$, $p = .01$, 95% CI [0.02, 0.14], showing greater attitude change for participants with initial negative attitude in the non-fit condition. These findings

confirmed that the current findings are *not* contingent on the chosen methodology. However, the interaction between non-fit and a continuous measure (5-items averaged) of initial attitude was marginally significant, $\beta = 0.11$, $t(205) = 1.82$, $p = .07$, 95% CI [-0.01, 0.24], supporting the conceptualization that the strength of the initial attitude matters for the regulatory non-fit effect.

Figure 12: Attitude change improvement toward surveillance as a function of measured initial attitudes and having a fit or a non-fit advice message



* $p < .05$;

Additional Analysis. Exploring promotion and prevention regulatory fit, I ran the following 3-way analysis: 2(fit; non-fit) x 2(initial positive attitude; initial negative attitude) x 2(promotion; prevention) on the variable attitude change improvement. The interaction was not significant, $\beta = -0.48$, $t(202) = -1.10$, $p = .27$.

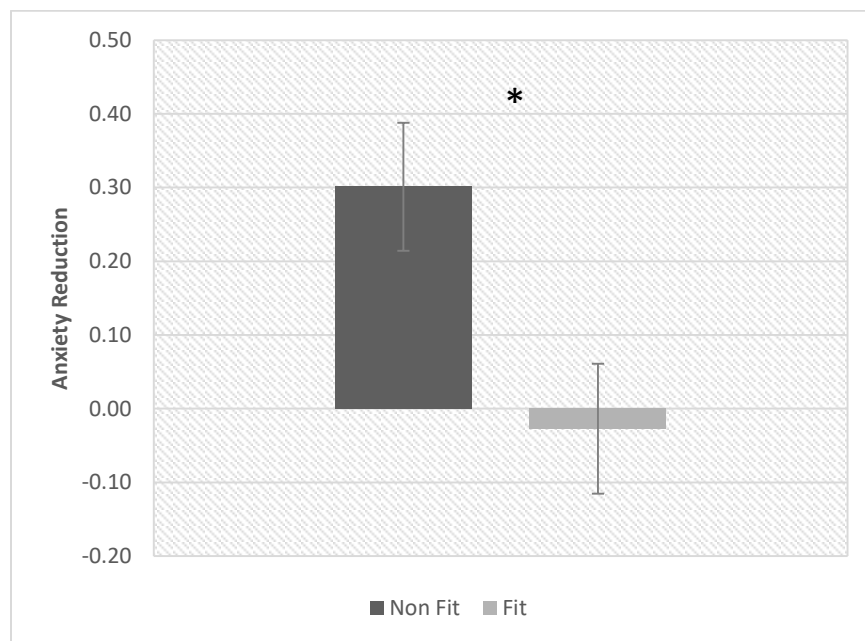
I then analyzed promotion and prevention regulatory fit separately. For participants who experienced prevention regulatory fit ($n = 106$), I ran the following analysis: 2 (fit; non-fit condition) by 2 (initial negative attitude toward hospice; initial positive attitude toward hospice) on the depended variable attitude change improvement. There was a main effect of the initial attitude toward surveillance, $\beta = -0.59$, $t = -2.70$, $p < .001$, 95% CI = [-1.03, -0.16], that indicated that participants who had initial negative attitude toward surveillance improved it significantly more ($M = 0.26$, $SD = 1.03$) than participants who had initial positive attitude ($M = 0.21$, $SD = 0.52$). Consistently with the main findings, the further analysis demonstrated that participants who had initial negative attitude towards hospice improve their attitude marginally more in the non-fit condition, ($M = 0.51$, $SD = 1.26$ $\beta = -0.42$. $t = -1.68$, $p = .09$), compared to the fit condition ($M = 0.04$, $SD = 0.77$). There were no significant relationships between the fit and non-fit condition for participants who had initial positive attitude toward hospice ($\beta = 0.13$, $t < 1$). The interaction was marginally significant, $\beta = 0.55$, $t = 1.90$, $p = .06$, 95% CI = [-0.03, 1.13].

For participants ($n = 104$) who experienced promotion regulatory fit, I ran the same analysis. The findings indicated that the main effect of initial attitudes towards hospice care was significant, $\beta = -0.15$, $t = -2.18$, $p < .03$, 95% CI = [-0.98, -0.06], suggesting that participants who had initial negative attitudes toward hospice improved it significantly more ($M = 0.42$, $SD = 0.70$) than participants who had initial positive attitudes toward hospice ($M = 0.20$, $SD = 0.56$). The interaction was not significant, $\beta = 0.29$, $t = 1.00$, $p = .32$, 95% CI = [-0.29, 0.87]. Participants who had initially negative attitude towards hospice care improved it more, but not significantly $M = 0.52$, $SD = 0.49$, $\beta = -0.32$, $t = -1.26$, $p = .21$, 95% CI = [-0.82, -0.19] in the condition of non-fit compared to the fit condition ($M = 0.32$, $SD = 0.86$). Participants who

experienced positive attitude towards hospice were not affected significantly by condition ($\beta = -0.02, t < 1$).

Anxiety reduction. Exploring the effect of regulatory non-fit, I ran an ANOVA test with the dependent variable anxiety reduction. As it is shown on Figure 13, the analysis revealed that participants who received the non-fit advice message experienced a greater anxiety reduction ($M = 0.30, SD = 0.91$) than participants who received the fit message, $M = -0.03, SD = 0.91, \eta^2 = .03, F(1) = 6.99, p = .01$.

Figure 13: Anxiety reduction as a function of having a fit or a non-fit advice message.



* $p < .05$;

Discussion

Study 7 conceptually replicated findings of Chapter 3, suggesting that participants with a negative attitude toward a recommended option improved their initial attitudes significantly

more in the condition of non-fit advice than fit advice. In addition, this study showed that not only attitude change improvement is affected by regulatory non-fit but also cancer anxiety was reduced in the non-fit condition. These are notable findings giving that the cancer anxiety was suggested as one of the main influential factors that impact patient tendency to reject advice for surveillance (van den Bergh et al., 2009). Taken together the findings that showed the attitude improvement and anxiety reduction indicate that decision makers have a more neutral perception of an advised option if they experience non-fit. That, in turn, could potentially facilitate a more balanced process of the evaluation when a beneficial but frightening or unpleasant option is recommended.

Chapter 5: General Discussion

Main Findings & Limitations

This dissertation discusses how to improve communications between physicians and patients. Seven studies demonstrate that regulatory non-fit experiences facilitate attitude changes in the context of providing advice for a potentially unpleasant or frightening option to patients. If participants had an initially negative attitude toward an option, they de-intensified it if they experienced regulatory non-fit (vs. fit), which physicians could create if they frame advice (gains vs. avoiding losses) to mismatch patients' motivational orientation (promotion vs. prevention).

This reduction of negative attitudes resulted in participants experiencing less negative emotions while receiving upsetting advice as Study 2 shows. As a result, they were more open toward accepting such advice at a higher rate than participants who experienced regulatory fit. Their acceptance rate likely indicates that regulatory non-fit motivates participants to pay more attention to arguments, such as medical expert's advice, rather than reject advice under the influence of negative emotions.

Supporting the effect found in Study 2, Study 7 demonstrates that participants reported a cancer anxiety reduction if they experienced regulatory non-fit. However, unlike in Study 2, regulatory non-fit decreased cancer anxiety regardless of participants' initial attitudes. Perhaps, this was due to the difference in methodology. The procedure in Study 2 captures participants' experiences when receiving advice more accurately than the procedure of Study 7. In Study 7, participants reported cancer anxiety answering questions about their daily cancer worries. Thus, in Study 7, the observed anxiety reduction does not depend on participants' initial attitudes toward the recommended option. The differences in the results of Study 2 and 7 raise a question whether the reduction of negative attitudes toward a frightening option (e.g. non-cancer treatment options) could influence cancer anxiety that is not related to a particular conversation but rather reflects patients' overall stress of having cancer. Reduction of cancer anxiety might facilitate patients' willingness to consider information that physicians deliver not only about one unpleasant option but also about all other options. In this case, regulatory non-fit will help to ensure that patients make an informed choices as they consider all available options thoughtfully.

Additionally, regulatory non-fit affected not only emotions, but it made participants feel more satisfied with their choices when they accepted upsetting advice. This finding illustrates that once participants reduce their negative attitudes toward an option, they make future decisions based on the changed attitude. This provides evidence that an attitude change triggered by regulatory non-fit is not an instant effect pertaining to a single discussion. Once patients change their attitudes, the new attitude becomes a reference point, and it guides participants' future choices.

My work raises several questions for the future exploration. The idea of creating a fit or non-fit to individuals' motivational needs was tested here using regulatory focus. However,

other examples of fit and non-fit based on regulatory mode (e.g., Avnet & Higgins, 2003) or construal level (Trope & Liberman, 2011), would be expected to have similar effects on attitude change and should be explored in the future studies.

Future research should also include a control condition in which all arguments are neutrally framed in order to be able to compare fit with control and non-fit with control, and thereby examine better whether what was found in the present studies was more a non-fit effect or a fit effect or both effects. I expect that including a control condition in future research would yield results similar to those observed in Lockwood et al. (2002) where both a fit versus control effect and a non-fit versus control effect were found. Their study provided evidence that regulatory fit and non-fit can each have their own effect on individuals' motivation and behavior.

Several limitations influence the generalizability of this research. Unlike previous research on regulatory fit, the results here did not reveal significant differences in attitude changes in regulatory fit conditions for participants with an initially positive attitude. Specifically, past studies suggest that participants with an initially positive attitude should experience more attitude improvement when in the regulatory fit (*vs.* non-fit) condition (Higgins et al., 2003). This absence of an effect likely represents a ceiling effect, as participants' initial attitudes were already so positive. The complementary problem is that one might expect regulatory fit to make an initial negative attitude even more negative. Again, for those who begin with a negative attitude, worsening it would be difficult because they were already quite negative.

Another limitation of the present research is that it was mostly limited to extremely negative experiences that involve terminal diseases. Thinking about death and making decisions

in this context could limit the generalizability of the results. Somewhat addressing this limitation, Study 7 explored the effect of regulatory non-fit in the context of prostate cancer that often does not affect individuals' length of life. Nonetheless, future research should explore non-fit effects in other less extreme medical situations and in non-medical situations. Another limitation of this research is that I recruited online Internet participants (mechanical turk.com) in the studies. Mechanical Turk participants provide reliable behavioral data (Buhrmester et al., 2011; Paolacci & Chandler, 2014; Paolacci, Chandler, & Ipeirotis, 2010). I decided to pursue this diverse population of participants, who represent the US population preferences for end-of-life care better than young student population. People change their preferences toward more aggressive interventions when their age advances and health declines (Winter, Moss, & Hoffman, 2009). Thus, an online population that is older than a student sample better matches the goal of this research to investigate participants' preferences at the end of life or following a prostate cancer diagnosis (a disease of old age) in the experimental settings.

However, a disadvantage of using online population is that participants are healthy individuals whose decisions might differ from the decisions of actual patients. Undoubtedly, reading about getting cancer is different from actually having cancer. To address this limitation in Study 2, I recruited participants who observed someone having cancer and someone being in hospice care. Observing other people informed the participants about patients' experiences. In fact, those participants who have this experience and who do not have it made decisions differently under the influence of regulatory fit and non-fit experiences. Study 5 explores and discusses this difference. Furthermore, in Study 6a & 6b, patients who have cancer participated in the experiment. The results of Study 6a & 6b support the main hypothesis and findings of experimental studies with healthy individuals. While more data needs to be collected from

patients in different medical hospitals in order to increase the generalizability of the present findings, this research provides initial evidence that that the non-fit advice framing is an important and relevant intervention for actual physician-patient communications.

Perhaps, the most important limitation of these studies that should be addressed by further research is that participants report their attitudes toward hypothetical situations. At this stage of the research, it would be unethical to explore the proposed intervention in actual clinical settings. Therefore, both healthy individuals and cancer patients reported their attitudes imagining a hypothetical choice. After my experimental studies demonstrated the effectiveness of the non-fit approach, this intervention should be tested in a field study. The next step would be to train physicians to use regulatory non-fit in actual communications and measure patients' attitude toward beneficial but frightening options before and after a consultation.

Theoretical Contributions

This work contributes to the literature about regulatory non-fit in several ways. Whereas previous studies measured attitude after manipulating regulatory non-fit (Koenig et al., 2009; Vaughn, Malik, et al., 2006; Vaughn, O'Rourke, et al., 2006), I assess attitude before and after the manipulation exploring how the effects of regulatory non-fit on attitude change differ as a function of initial attitudes. This method allows me to document orthogonal directions of attitude change. If participants experience regulatory non-fit in communications, their initial strong negative attitudes became less negative (Study 1-7), and their initial strong positive attitudes became less positive (Study 4).

This research also highlights that not only regulatory fit could make attitudes more positive as it was demonstrated in previous research (Bosone, Martinez, & Kalampalikis, 2015; Cesario, Corker, & Jelinek, 2013), but also regulatory non-fit could improve attitudes. If individuals have initially negative attitudes toward an option, regulatory non-fit is a more effective way to improve them.

This dissertation underlines an important quality of regulatory non-fit. Similar to regulatory fit, regulatory *non-fit* influences attitude via two different channels depending on participants' initial involvement in the subject. Participants with high involvement change their attitudes in the regulatory non-fit condition because they become less confident in their initial attitude. At the same time, participants with low involvement process information differently. In the experiments, they did not have enough personal knowledge to weigh the costs and benefits of the advised option of hospice care. Thus, they used feeling wrong and feeling right, feelings created by non-fit and fit conditions respectively as decisional heuristics. They transferred these feelings directly to the discussed target – hospice care. As a result, they made their initial negative attitude more negative in the non-fit condition and more positive in the regulatory fit condition. These findings provide evidence that regulatory non-fit, like regulatory fit (Avnet et al., 2013), could operate through two different channels. Furthermore, these results reconcile the differences in previous research findings that show how a feeling wrong, which results from regulatory non-fit, can be used as information (misattribution) (Vaughn, Malik, et al., 2006; Vaughn, O'Rourke, et al., 2006), or could reduce confidence in own evaluations (Tam, Bagozzi, & Spanjol, 2010).

One additional issue needs to be addressed. Could dissonance theory explain the attitude change that occurred in this research? One might argue that individuals who are experiencing

‘feeling wrong’ about their initial evaluation (a dissonant cognition) change their attitude in order to reduce this negative feeling of unease. This could contribute to the effects found, although it should still be noted that the ‘feeling wrong’ itself is being produced by regulatory non-fit framing of the advice being given rather than by a cognitive inconsistency per se. In addition, such a dissonance contribution would be true only for participants who are highly involved in the discussed subjects. Dissonance theory would be silent about what happened with low involved participants’ attitude change. Misattribution or transfer of the negative ‘feeling wrong’ experience is a more plausible explanation for the attitude change that occurred with low involvement participants.

The dissertation also suggests a boundary condition for the effect of regulatory non-fit. It appears that regulatory non-fit effect may depend on the strength of participants’ initial attitude. In Study 4 (advice for chemotherapy), the effect of regulatory non-fit on attitude change was weaker than in its twin, Study 3 (advice for hospice care). Perhaps, participants experienced initial negative attitude more intensely toward hospice care than toward chemotherapy, which resulted in the stronger effect of regulatory non-fit on attitude change improvement in Study 3. Future research should consider initial attitude strength more systematically to explore the effect of regulatory non-fit on attitude change as a function.

Another question that should be addressed in the future is the difference between promotion and prevention regulatory non-fit. Although I found that both promotion non-fit and prevention non-fit changed participants’ attitudes in the same direction, the strength of the effect varied. If hospice was advised, promotion had a somewhat stronger effect than prevention non-fit (Studies 1-3, 5). On the other hand, prevention non-fit had a somewhat stronger effect if chemotherapy or surveillance were recommended (Studies 5 and 7). The characteristics of a

decision-making situation might itself influence the strength of the promotion non-fit and the prevention non-fit by contributing its own additional non-fit characteristics. Thinking about hospice care, for example, could enhance a non-fit experience for promotion-oriented participants who might find it difficult to imagine growth and development while being in hospice. It should also be noted that participants' non-fit, beyond producing a 'feeling wrong' feeling, could evoke different affective experiences. When 'feeling wrong' about their initial evaluation of an option leads participants to feel less negative about that option, the reduced negativity could influence different feelings for promotion versus prevention individuals (see Higgins, 2001), with promotion-oriented individuals experiencing less dejection-related feelings (e.g., less sad, discouraged) and prevention-oriented individuals experiencing less agitation-related feelings (e.g., less tense, nervous). It is possible that strength of attitude change could also vary as a function of which kinds of negative feelings are reduced in the regulatory non-fit condition.

Practical Implications

The dissertation adds to the clinical research that investigates how behavioral interventions could help in communicating negative information to patients (Porensky & Carpenter, 2016; van Osch, Sep, van Vliet, van Dulmen, & Bensing, 2014; van Vliet, van der Wall, Plum, & Bensing, 2013). Specifically, this work proposed a conceptually new approach that helps physicians reduce patients' negative reactions toward a potentially disliked option, and helps facilitate patients' willingness to consider this option in their decision-making process.

The high stakes of medical decisions often cause strong negative emotional reactions, particularly toward stigmatized or misunderstood options such as hospice care or active

surveillance for prostate cancer. Patients who decided which treatment to receive while in this state of negative attitudes may choose an option that does not actually meet their goals because the negative reactions may inhibit rational thinking. In these situations, regulatory non-fit could be particularly helpful and relevant. By decreasing negative attitudes, regulatory non-fit may allow patients to think more rationally about their choices. A deliberate evaluation of all options, including upsetting ones, could help patients better align their treatment choices with their long-term goals. Supporting this notion, findings of Study 3 indicates that regulatory non-fit has positive downstream consequences, such as improving choice satisfaction.

To implement regulatory non-fit in practice, a physician could consider recommending a beneficial but frightening option, such as hospice care, by framing it in the way that would be counter to the patients' motivational orientation to reduce their engagement and confidence in their initial negative attitudes toward the option. During a consultation, a physician could assess or prime promotion or prevention focus by asking questions that focus a patient thinking about avoiding losses or achieving gains. For example, if a patient discusses her goals, and she emphasizes maintaining non-losses and avoiding losses, she is likely in prevention focus that orients her to think, first, about what losses a hospice care could help her to avoid, for example, avoid a lesser quality of life. The physician could emphasize, then, aspects that would help the patient to achieve gains, such as attaining a better quality of life and achieving more meaningful time with loved ones. This manner of information framing would help a patient to reduce her negative reactions toward the hospice recommendation and would likely encourage her to consider the advice more thoroughly, rather than reject it defensively. Future research should explore potential downstream consequences of regulatory non-fit, both positive and negative.

For example, whether improving attitude via regulatory non-fit could inadvertently bias participants' choices against their true preferences.

Importantly, the results of Study 5 suggest that physicians may wish to adjust their advice as a function of their patients' involvement. If patients have prior knowledge and, therefore, are more involved in the information processing, regulatory non-fit could be used to help participants decrease their initial negative attitudes toward a recommended option. In rarer cases, when patients are not involved in the information processing, it may be better to increase their involvement to a high level prior to providing advice, which would then be given in a regulatory non-fit manner.

Some may ask, why not instead use regulatory fit to improve attitudes by creating a positive "right" feeling toward a target option? A concern is that this approach could produce impulsive choices rather than choices based on arguments, expert advice, and careful, rational consideration of the alternatives. Future studies should investigate whether choice satisfaction may differ depending on participants' initial involvement and whether attitude change improvement was achieved via a regulatory fit or non-fit approach.

Conclusion

In conclusion, the dissertation demonstrates that if an unpleasant or potentially frightening option has to be recommended, the de-intensification of a negative evaluation through mismatching patients' personal goal orientations and the focus of physician advice can improve patients' attitudes toward the option. Regulatory non-fit improves the evaluation of a target option by decreasing confidence in initial (negative) evaluations, which, in turn, can motivate participants to pay more attention to arguments, such as the advice of a medical expert,

rather than being biased by irrational negative emotions. This can increase the likelihood that participants will choose the recommended option, as well as increase their choice satisfaction. Therefore, when decisions involve intense initial (potentially irrational) negative evaluations of a beneficial option, it may be a useful decision-making strategy to create regulatory non-fit between the decision maker's motivational orientation and the framing of advice for the initially disliked option.

NOTE: Study 2, 3, 4, 5, 7 are published in the Personality and Social Psychology Bulletin. Vol 42, Issue 8, pp. 1025 - 1044

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