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Using a Non-Fit Message Helps to De-Intensify Negative Reactions to Tough Advice

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Abstract

Sometimes physicians need to provide patients with 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. We explore whether regulatory non-fit could be used to improve these types of situations. Across five studies in which participants imagined receiving upsetting advice from a physician, we 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, we showed that the mechanism of regulatory non-fit differs as a function of participants' cognitive involvement in the evaluation of the option.

Keywords

attitude change; regulatory fit; decision making; advice

The physician's task is to help patients navigate difficult decisions by ensuring that patients' choices match their true preferences and goals (Trice & Prigerson, 2009). In order to perform this task effectively, physicians may need to advise options that sound frightening or unpleasant. However, patients may not wish to hear such recommendations. About 77% of patients do not want to discuss their end-of-life care with their primary oncologists (Dow, et al., 2010), even though this is arguably an important part of medical decision making, particularly within the field of oncology. Moreover, if they do receive advice for a frightening or unpleasant option, they may reject it without appropriate consideration. For instance, Harrington and Smith (2008) discussed a 56-year-old businessman diagnosed with

terminal cancer who rejected his physician's recommendation for hospice care. After his death, his wife revealed that his main goal of treatment was to spend more meaningful time with his kids, family, and friends, which could have been provided with hospice care. Sadly, because he rejected his physicians' advice for hospice care, he spent the majority of his post-diagnosis life in the hospital, half-conscious, without the physical strength to say "good bye" to his family. This story illustrates how patients may suffer if they reject their physicians' advice due to fear or emotional processing of the advice, particularly if the advice aims to help patients align their choices with their preferences.

As a result of such deficiency in physician-patient communication, particularly when tough choices have to be made, many people do not achieve their preferences in their last months of living (Ho, et al., 2011). When surveyed, the majority of patients reported that they would choose quality of life, comfort, and being at home at the end of life (Barnato, et al., 2007). However, patients often continue to pursue aggressive treatment, which reduces their quality of life without significantly improving their quantity of life, particularly if their disease advances (Goodman, Morden, Chang, Fisher, & Wennberg, 2013; Weeks, in et al., 2012).

Conducting discussions about reducing aggressive care (and enrolling in a hospice program) when disease irreversibly worsens is essential to ensure that patients' treatment choices match their preferences at the end of their lives (Chen, et al., 2013; Lin, Levine, & Scanlan, 2012; Quill, Arnold, & Back, 2009; Vig, Starks, Taylor, Hopley, & Fryer-Edwards, 2010; Weeks et al., 2012). A better understanding of how to advise the reduction of aggressive care, an option that may sound unpleasant or frightening, is an important step for improving physicians' consultations and, as a result, patients' care.

We propose that regulatory non-fit could be used to help patients' consider physicians' advice in these types of settings, particularly if the advice is frightening or unpleasant. Regulatory Fit Theory (see Higgins, 2000, 2006) posits that the intensity of individuals' evaluation of a choice or decision outcome may depend upon the fit between their motivational orientation (e.g., promotion; prevention) and the framing of an option (achieving gains; avoiding losses). Motivational orientation differs across individuals, and relates to whether they tend to pursue goals/make decisions with a focus on promotion (concerned with attaining a better state) or prevention (concerned with avoiding a worse state). If individuals pursue goals in a manner that supports their current personal motivational orientation, they experience regulatory fit (e.g., Higgins, 2000, 2006, 2012) which intensifies the evaluation of the goal or discussed target (Cesario, Corker, & Jelinek, 2013; Cesario, Grant, & Higgins, 2004; Higgins, Idson, Freitas, Spiegel, & Molden, 2003).

While regulatory fit is a relatively well-described phenomenon (e.g. Avnet & Higgins, 2003, 2006; Avnet, Laufer, & Higgins, 2013; Camacho, Higgins, & Luger, 2003; Motyka et al., 2014; Cesario et al., 2013; Cesario et al., 2004; Cesario, Higgins, & Scholer, 2008; Higgins et al., 2003; Idson, Liberman, & Higgins, 2004; Koenig, Cesario, Molden, Kosloff, & Higgins, 2009), there are only a few studies that explicitly test effects of its complement – regulatory *non-fit* (e.g. Koenig et al., 2009; Vaughn, Malik, Schwartz, Petkova, & Trudeau, 2006; Vaughn, et al. 2006). Our research adds to the theoretical knowledge by examining the regulatory *non-fit* phenomenon and highlighting its previously unknown effect on attitude

change in decision-making scenarios. We propose that regulatory non-fit weakens or de-intensifies the evaluation of a target option. In tough conversations, when an unpleasant or potentially frightening option needs to be recommended, reducing initially negative evaluative reactions to this option could be beneficial. Furthermore, most of the studies about regulatory fit demonstrate its effect on increasing an initially positive attitude toward a discussed target (Motyka, et al., 2014). We propose that when initial attitude is *negative*, regulatory *non-fit* could be a more effective way to facilitate attitude change improvement.

In addition, our research aims to develop a connection between social psychology and medical decision making. Contemporary literature in bioethics highlights the importance of applying behavioral theories to medical decisions and communications (Fridman, Epstein, & Higgins, 2015; Reyna, Nelson, Han, & Pignone, 2015; Verma, Razak, & Detsky, 2014). However, there is little empirical evidence for the effective application of behavioral theories in the context of medical treatment decisions. Therefore, this research contributes to translational research between social-psychology and medical decision making.

Below, we provide a theoretical background concerning regulatory fit and non-fit, and then propose a novel application of regulatory non-fit within the domain of medical decisions. We specifically consider how regulatory non-fit may affect patients' perception of potentially frightening treatment options within the setting of a cancer diagnosis, and how this effect may differ as a function of patients' involvement in the decision.

Regulatory Fit and Non-Fit

The principles of regulatory fit theory are well illustrated through the motivational orientations and strategies associated with regulatory focus theory (Higgins, 1997, 1998, 2014). Regulatory focus theory distinguishes between two motivational orientations: promotion and prevention. Individuals in a promotion-oriented motivational orientation want to attain progress, moving from their current status quo, "0", to a better "+1" state. In contrast, individuals in a prevention-oriented motivation want to maintain a satisfactory status quo, ensuring against "-1" losses. Promotion-oriented individuals experience regulatory fit when they move toward their desired end-states through eager means (i.e., ensuring advancements), whereas prevention-oriented individuals experience regulatory fit when they move toward their desired end-states through vigilant means (i.e., being careful to avoid mistakes). In contrast, when promotion-oriented individuals move toward their desired end-states through vigilant means or prevention-oriented individuals move toward their desired end-states through eager means, they experience regulatory non-fit.

Effects of Regulatory Fit

Multiple experiments and naturalistic studies have demonstrated that fit between personal goal orientations (prevention; promotion) and the manner of goal pursuit (eagerness; vigilance) intensifies participants' evaluations of the targeted option (Avnet & Higgins, 2003; Avnet et al., 2013; Cesario et al., 2013; Cesario et al., 2004; Motyka et al., 2014). When experiencing regulatory fit, individuals "feel right" about their decisions and the goal (discussed target) itself (Higgins, 2000). A robust effect of regulatory fit and "feeling right"

has been shown in studies exploring evaluations and attitudes. For example, Higgins et al. (2003) found that participants evaluated an option more positively and were willing to pay 40–60% more for a product if they experienced regulatory fit. Other researchers have found that the enhanced evaluation of an option in the condition of regulatory fit (compared to non-fit) was associated with a stronger positive attitude toward the option (Cesario et al., 2004), an increased willingness to engage in an activity (Hong & Lee, 2008; Zhao & Pechmann, 2007), and an increased likelihood of choosing a brand (Labroo & Lee, 2006).

Regulatory Fit and Involvement

The effects of regulatory fit depend upon the decision-maker's level of involvement (Avnet et al., 2013). Involvement, in turn, depends (partially) on the decision-maker's previous knowledge of a subject. People are more likely to process a message with high involvement when they have knowledge about a target discussed in the message. They can 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 (Cacioppo & Petty, 1984). On the other hand, people are more likely to process information with low involvement when they have no prior knowledge; they will not be able to access relevant memories, and therefore will be less motivated to evaluate the message comprehensively (Wood, 1982).

Under high involvement participants care more about their evaluative reactions, and “feeling right” increases their confidence in their initial judgments (cf. Briñol, Petty, & Barden, 2007). Positive “feeling right” from regulatory fit leads participants to rely more on their initial evaluations, thereby strengthening both initial positive evaluations and initial negative evaluations. That is, participants who experience regulatory fit evaluate an option more negatively if they had an initial negative evaluation and more positively if they had an initial positive evaluation.

In contrast, under low involvement, participants experience “feeling right” and transfer this positive feeling directly to the object of evaluation (Avnet et al., 2013). They use this feeling as information and apply it directly to evaluations of a target (e.g. for review Clore, et. al, 2001; Schwarz & Clore, 2003). Consequently, participants evaluate the target more positively in the fit (vs. non-fit) condition (see Labroo & Lee, 2006; Lee & Aaker, 2004), even when they are given negative information about the target (Avnet et.al, 2013). In general, this conceptualization of regulatory fit and involvement is consistent with the dual processing model, which distinguishes between the peripheral information processing that occurs under low involvement and then systematic processing of the information that occur under high involvement (e.g. Chaiken, 1980; Petty, Cacioppo, & Schumann, 1983).

Effects of Regulatory Non-Fit

Alternatively, if individuals' motivational orientation (promotion; prevention) and the manner of their goal pursuit (eager; vigilant) do not match, they experience regulatory non-fit. In contrast to regulatory fit, regulatory non-fit makes people “feel wrong”. Regulatory non-fit works as a complement of regulatory fit via two different paths. Under low

involvement, participants' directly transfer "feeling wrong" to the target evaluation. Under high involvement, however, "feeling wrong" reduces participant's confidence in their initial judgments. Thus, under high involvement, an initial negative judgment of a target will become *less* negative when individuals "feel wrong" from regulatory non-fit.

In the current research, we focus primarily on the second mechanism of regulatory non-fit. Previous research has shown that "feeling wrong" from regulatory non-fit made participants doubt the correctness of their judgments which, in turn, motivated them to invest more cognitive efforts in their evaluations (e.g., Koenig et al., 2009). As a result, in the non-fit condition, participants' judgments were more affected by strong arguments than by weak arguments, signaling that they were critically evaluating the arguments and investing more cognitive efforts than participants experiencing regulatory fit (Koenig et al., 2009). Furthermore, Vaughn, O'Rourke, et al., (2006) showed that participants' judgments were less affected by decision-making bias, when participants experienced regulatory non-fit (vs. regulatory fit). They found that participants experiencing non-fit were less confident in their initial judgments and were more motivated to adjust their judgments to environmental cues rather than processing the information according to a simplifying heuristic (namely, contrast bias). These findings support the notion that "feeling wrong" from regulatory non-fit creates doubts in the participants' initial evaluations and motivates them to think more thoroughly about a discussed option in order to resolve their doubts. Therefore, arguments presented to participants while they are experiencing regulatory non-fit have more chance to be heard and taken into consideration.

Current Research

In this research, we explore the effects of regulatory non-fit in the medical setting. Specifically, we explore the effects of regulatory-non fit when an expert-physician provides advice. Physicians' advice is a strong argument for a positive evaluation of an advised option, and often contains important information for patients to consider (Davison & Breckon, 2012). However, for participants who initially dislike the recommended option, their initial negative reactions may bias rational choices against statistical likelihoods (Zikmund-Fisher, Fagerlin, & Ubel, 2010) and prohibit them from fully considering physicians' advice. We propose that, for these participants, regulatory non-fit between the physician's advice and participants' motivational orientations may *de-intensify* initially negative attitudes toward the recommended option.

Like regulatory fit, we propose that the effect of regulatory non-fit will depend upon the decision-makers' level of involvement. Under low involvement, "feeling wrong" from regulatory non-fit would transfer to the target option directly and make the attitude toward the target option more negative. Under high involvement, however, "feeling wrong" from regulatory non-fit would produce lower confidence in their initial evaluations of the target. Individuals with an initial negative attitude, then, should be more open to considering arguments that oppose this negative attitude. When receiving advice from the expert-physician, which is itself a strong reason for choosing (liking) the option (Davison & Breckon, 2012), these individuals should re-evaluate their initial negative attitude to be more

positive. Notably, an initial positive attitude is unlikely to become more positive because of a ceiling effect.

Studies Overview

At this stage of our research, it would not be ethical or feasible to manipulate the framing of physicians' advice in real clinical situations. We must first use experimental settings to develop a better understanding of what effect this intervention could have on individuals' decision-making. In order to do so, we developed clinical hypothetical scenarios that were based on existing research. The scenarios and choices that we used in our studies were corrected and validated by clinical oncologists. These scenarios were administered on-line to the participants who were located in the US and could encounter these situations in their lives.

Across all of our studies, we evaluate the change in participants' attitudes toward a non-treatment (e.g. hospice care) or treatment (e.g. chemotherapy) option after receiving advice from the physician for that option in the context of a hypothetical cancer diagnosis. Specifically, we examine whether the effect of the physicians' advice on attitudes toward the option may differ as a function of whether the form of the advice (manipulated) matches individuals' motivational orientation (manipulated). In particular, we are interested in this effect for individuals with an initially negative attitude toward the treatment option (measured and manipulated). Within specific studies, we examine additional aspects of this phenomenon, including the moderating role of involvement. Below, we briefly discuss how each study contributes to the overall understanding of the effect of regulatory non-fit in the context of cancer treatment choice.

In Study 1, we examined the effect of regulatory non-fit on participants' attitudes toward hospice care as a treatment option in the context of a terminal cancer diagnosis. We manipulated participants' initial attitude and whether advice for hospice was given in a regulatory non-fit or fit manner (by manipulating both regulatory orientation and advice framing). Finally, we standardized participant's choice, asking all participants to imagine that they chose hospice care (the recommended option) in order to assess participants' choice satisfaction. The aim was to explore whether regulatory non-fit affected attitudes and helped participants to re-evaluate the discussed option, which should result in higher choice satisfaction.

In Study 2, we repeated the procedure of Study 1 but recruited participants with personal experience with hospice care (which again standardized knowledge and involvement). In this way, we examined whether our findings held when initial attitude toward the treatment option was measured (rather than manipulated). In addition, we tested the impact of regulatory non-fit on participants' choice and examined whether a decrease in negative emotions mediated the impact of regulatory non-fit on their choice of hospice.

In Study 3, we repeated the procedure of Study 2 with a few changes. Most notably, we changed the context of the choice to early stage prostate cancer in which physicians advised

active surveillance (vs. active treatment) to examine whether our results translated across medical contexts.

In Study 4, we repeated the procedure of Study 2 but examined the moderating role of involvement by recruiting participants with and without hospice experience. In this way, we examined whether our effects persisted for individuals with high and low involvement or whether, as expected, low involvement would be a boundary condition for our non-fit effect (i.e., increasing rather than decreasing an initial negative attitude).

Finally, in Study 5, we repeated the procedure of Study 1 but changed the recommended procedure and chosen option to chemotherapy in order to examine whether our effects persisted if advice was given for an active treatment option.

Study 1

In Study 1, we examined the effect of regulatory non-fit on participants' attitudes toward hospice care as a treatment option in the context of a terminal cancer diagnosis. We manipulated participants' initial attitude and whether advice for hospice was given in a regulatory non-fit versus fit manner (by manipulating both regulatory orientation and advice framing). Finally, we standardized treatment choice, asking all participants to imagine that they chose hospice care (the recommended option). We also measured choice satisfaction and commitment. Improved choice satisfaction and commitment of participants with initial negative attitude should provide additional evidence that regulatory non-fit helps individuals to re-evaluate the discussed option. The following hypotheses 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: For participants with an initial negative attitude, choice satisfaction will be stronger for participants in the non-fit condition compared to the fit condition.

Method

Participants—A total of 101 ($M_{age} = 38.90$, $SD_{age} = 15.24$, Male = 41%) American Mechanical Turk workers participated in the on-line survey for monetary compensation. At the beginning of the survey, we prescreened participants such that only participants who had no experience with hospice care were included in the study.

Procedure—To ensure participants high involvement in the evaluations, participants learned about hospice care by reading comments of other people at the beginning of the survey. The comments were pre-collected from those who observed their relatives' or friends' experience of hospice care. In addition, we manipulated initial attitude toward hospice. As shown in Table 1, participants in the initial positive attitude condition read four positive comments and two negative comments about hospice care. For the negative attitude condition, we used the same basic content of the comments but altered the wording to reverse the valence of the evaluation. Therefore, participants in the initial negative attitude condition read four negative comments and two positive comments about hospice care.

Participants' initial attitude toward hospice care was then assessed using five Likert-scale questions (Appendix 1).

Next, we manipulated participants' regulatory focus (promotion; prevention) using the method of Higgins, Roney, Crowe, and Hymes (1994). In the promotion condition, participants listed their ideal goals (hopes and aspirations) whereas participants in the prevention condition listed their ought goals (duties and responsibilities).

All participants then read a hypothetical vignette based on articles about Non-Small-Cell Lung Cancer (Group, 2008; Klastersky & Paesmans, 2001; Verma et al., 2014) that instructed them to imagine that they had been diagnosed with a terminal lung cancer with two primary treatment options: chemotherapy that provided a 30% chance of 15 months survival and a 70% chance of 7 months survival, or hospice care that provided an average of 8.5 months survival.

Then, we manipulated the framing of physicians' advice for hospice care (eagerness vs. vigilance) (Higgins et al., 2003). Participants either received a recommendation for hospice care that emphasized gains they could achieve (eagerness) or the losses they could avoid (vigilance) by choosing hospice care (for the vignette and the manipulation see Appendix 2).

All participants were then told to imagine that they carefully considered each option and decided to follow their physician's advice and choose hospice care. Participants reported their decision satisfaction and (post-advice) attitude toward hospice care. Since participants were told that they followed physician advice, we assessed trust in physician's expertise. Finally, participants answered several true/false questions to determine if they had misconceptions about hospice, reported their demographics and read a disclosure note which revealed that the comments about hospice care were fictitious.

Measures

Fit and non-fit conditions—Participants were assigned to the fit condition if they were either in the promotion condition and received advice that emphasized achieving gains or in the prevention condition and received advice that emphasized avoiding losses. Participants were assigned to the non-fit condition if they were either in the promotion condition and received advice that emphasized avoiding losses (vigilant strategy) or in the prevention condition and received advice that emphasized achieving gains (eager strategy). As in previous research (Lee & Aaker, 2004; Vaughn, Malik, et al., 2006), we collapsed across the two fit conditions and across the two non-fit conditions¹.

Attitude change improvement—We created a continuous measure of "attitude change improvement" by subtracting participants' initial attitude toward hospice from their post-advice attitude toward hospice. Both attitude measures were created by averaging scores

¹For each study, we conducted a 3-way analysis 2(regulatory fit: fit; non-fit) × 2(regulatory focus: promotion; prevention) × 2(initial attitude: negative; positive) to determine whether the effect of regulatory fit versus non-fit differed as a function of participants' regulatory focus (promotion vs. prevention). None of the 3-way interactions were significant. The 2-way interactions for promotion- and prevention-oriented participants showed the same pattern as our main results (see Appendix 3). These results suggest that it is appropriate to collapse across the two regulatory focus conditions

from five items (Appendix 1) designed to assess attitude toward hospice (Initial attitude: $\alpha = 0.89$, $M = 4.25$, $SD = 1.35$; Post-advice attitude: $\alpha = 0.89$, $M = 4.74$, $SD = 1.19$). In the resultant scale of attitude change improvement ($M = 0.49$, $SD = 0.60$), more positive numbers indicated that participants' attitude became more positive after receiving the physician's advice.

Choice satisfaction—Participants reported their choice confidence, choice satisfaction, and commitment to the chosen option. These three items were rated on a 7-point Likert scale ($1 = \text{not at all to } 7 = \text{very much}$). The items were averaged to create the variable "choice satisfaction" ($\alpha = .90$, $M = 4.73$, $SD = 1.67$).

Results

Manipulation check—As expected, participants in the initial positive attitude condition had a more positive attitude toward hospice ($M = 5.02$, $SD = 0.94$) than participants in the initial negative attitude condition, $M = 3.48$, $SD = 1.26$; $t(100) = -7.02$, $d = -1.38$, $p < .001$, 95% CI $[-1.97, -1.11]$.

Attitude change improvement—To explore the effect of regulatory non-fit on attitude change improvement, we ran a 2(regulatory fit: fit; non-fit) $\times$ 2(initial induced attitude: negative; positive) regression using PROCESS procedure Model 1 (Hayes, 2013) on attitude change improvement as a dependent variable.

There was a significant interaction between regulatory non-fit/fit and initial attitude, $\beta = 1.02$, $t(96) = 2.58$, $p = .01$, 95% CI $[0.23, 1.81]$ ², indicating that the impact of regulatory non-fit on attitude change differed as a function of an initial attitude. As Figure 1 shows, for participants with an initial positive attitude, there was no effect of regulatory non-fit on attitude change improvement ($M_{fit} = 0.04$, $SD_{fit} = 0.78$; $M_{non-fit} = -0.07$, $SD_{non-fit} = 0.84$; $\beta = 0.11$, $t < 1$). However, consistent with our hypothesis (H1), for participants with an initially negative attitude, there was an effect of regulatory non-fit on attitude change improvement ($\beta = -0.91$, $t = -3.14$, $p < .01$, 95% CI $[-1.50, -0.34]$) whereby participants' attitude became *less* negative in the non-fit condition ($M_{non-fit} = 1.50$, $SD_{non-fit} = 1.23$) compared to the fit condition ($M_{fit} = 0.58$, $SD_{fit} = 1.19$).

Choice satisfaction—To explore the effect of regulatory non-fit on choice satisfaction, we ran a 2(regulatory fit: fit; non-fit) $\times$ 2(initial induced attitude: negative; positive) regression using the same statistical analysis as above adding the initial attitude variable as a covariate.

The interaction was significant, $\beta = 0.99$, $t(95) = 2.29$, $p = .02$, 95% CI $[0.13, 1.85]$. As shown in Figure 2, there was no effect of regulatory non-fit on choice satisfaction for participants with an initially positive attitude ($M_{fit} = 4.70$, $SD_{fit} = 1.77$; $M_{non-fit} = 4.41$, $SD_{non-fit} = 1.48$; $\beta = 0.29$, $t < 1$). However, consistent with our hypothesis (H2), there was

²Trust in a physician's expertise was included as a covariate in this analysis. In the vignette, patients' choice was determined by a physician's advice, therefore trust in the physician's expertise was a significant factor that influenced our dependent variables: attitude change improvement ($r^2 = .05$, $p = .02$) and choice satisfaction ($r^2 = .61$, $p < .001$).

an effect of regulatory non-fit on choice satisfaction ($\beta = -0.70$, $t = -2.35$, $p = .02$, 95% CI $[-1.28, -0.11]$) whereby participants were more satisfied with their choice in the non-fit condition ($M_{non-fit} = 5.29$, $SD_{non-fit} = 1.74$) compared to the fit condition ($M_{fit} = 4.59$, $SD_{fit} = 1.62$).

Discussion

Consistent with our predictions, the results of Study 1 showed that participants with an initial negative attitude toward hospice care experienced more attitude change improvement in the non-fit condition compared to the fit condition. Furthermore, participants with an initially negative attitude had higher choice satisfaction in the non-fit condition. These findings suggest that the advice given in the non-fit manner led to participants' re-evaluation of their negative initial opinion, which in turn resulted in their higher choice satisfaction.

Study 2

In Study 2, we repeated the procedure of Study 1 with a few changes. First, ensuring high involvement in evaluations, we recruited participants with actual experience with hospice care (participants observed a friend or relative with cancer and a relative or friend who chose hospice care) and measured (rather than manipulated) their initial attitude toward hospice care. In this way, we examined whether our findings held for individuals with naturally occurring negative attitudes toward hospice. In addition, participants indicated which treatment they would choose. Finally, we 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 et al., 2010). Previous research also suggests that in regulatory non-fit conditions, negative emotions could be reduced from participants' confidence in their initial evaluations being reduced (Koenig et al., 2009; Vaughn, O'Rourke, et al., 2006). This in turn could allow participants to pay more attention to arguments (Koenig et al., 2009; Vaughn, O'Rourke, et al., 2006), where the doctor's hospice recommendation functions as an argument. Given this, we predicted that for those with an initial negative attitude toward hospice, regulatory non-fit could increase choice of hospice by reducing negative emotions. The following hypotheses were 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: In the non-fit condition, participants with an initial negative attitude will report less negative emotions during 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.

Method

Participants—A total of 314 American Mechanical Turk workers (44% Male; $M_{age} = 55$; $SD_{age} = 11$) completed an on-line study for monetary compensation. At the beginning of the survey, we prescreened participants. Only those participants who observed a friend or

relative diagnosed with cancer and a friend or a relative receiving hospice care were included in the study. Forty two participants who initially passed the prescreen questions failed to confirm their experience with hospice care or cancer at the end of the questionnaire. They were excluded from this study. Thus, there were 272 participants in our analysis.

Procedure—Upon entering the survey, participants read the same hypothetical scenario as in Study 1, which asked them to imagine being diagnosed with a terminal lung cancer and two action plans were available to them (hospice care or chemotherapy). Participants then reported their initial attitude toward hospice. As in Study 1, we then manipulated participants' regulatory focus and the framing of the physician's advice for hospice care. After reading the advice, participants reported their (post-advice) attitude toward hospice care. Unlike in Study 1, we told participants to imagine that in few days a nurse called them to find out about their reactions when they were receiving the physician advice. She asked a series of questions designed to capture how they felt when they received the physician advice (sad, fearful, right etc.) when they were receiving the physician advice and what option they would choose (hospice vs. chemotherapy). Finally, participants reported their demographics.

Measures

Fit and non-fit conditions—As in Study 1, participants were assigned to the regulatory fit and non-fit conditions as a function of whether the framing of the physician's advice for hospice matched their regulatory focus (both manipulated).

Initial attitude—As in Study 1, we created a continuous measure of "initial attitude toward hospice" by averaging scores from all five items for each participant ($\alpha = 0.83$). Unexpectedly, however, the mean for participants was quite high ($M = 5.27$, $SD = 1.12$). As a reference, this mean was higher than participants in the initial positive attitude condition in Study 1 ($M = 5.02$, $SD = 0.93$). Although interesting in its own right (suggesting that many people have positive experiences with hospice care), this limited our ability to study the impact of regulatory non-fit on attitude change improvement as a function of initial negative attitude. In particular, we did not use a continuous variable of "initial attitude" because we do not expect that our effect operates on this continuum; in other words, regulatory non-fit effect might not facilitate attitude change improvement if overall average initial attitude is strongly positive. Therefore, we created a categorical variable to distinguish participants who had a more initial negative attitude from those who had a more positive attitude toward hospice care. First, we subtracted participants' scores on a negatively worded attitude question ("Hospice care will negatively change my life") from their scores on a positively worded attitude questions ("Hospice care will positively change my life")³. Participants were classified as having an initially positive attitude if their score on this variable was

³The choice to use 2 items instead of five was driven by the goal to identify people who have a stronger negative attitude than positive attitude. Using five items for the categorical variable will not accomplish this goal, because the group that scored below mean still had a very positive initial attitude toward hospice ($M = 4.35$, which is larger than total initial attitude means in Study 1. Notably, in our studies using a dichotomous variable: a) we were able to replicate our findings across the studies; b) using this approach, we discovered a similar effect of regulatory non-fit as in the research of Avnet et al, (2013); c) Studies 1 and 5, in which initial attitude was manipulated, showed the same pattern of results. This replications of our findings across studies suggests that our results are not idiosyncratic to the method of analysis.

positive ($n = 211$, $M = 5.69$, $SD = 0.78$) and as having an initially negative attitude if their scores on this variable was negative ($n = 61$, $M = 3.84$, $SD = 0.93$).

Attitude change improvement—We created a continuous measure of “attitude change improvement” by subtracting participants’ initial attitude toward hospice from their post-advice attitude toward hospice ($M = 0.16$, $SD = 0.61$). Both attitude measures were created by averaging scores from five items (Appendix 1) designed to assess attitude toward hospice (Initial attitude: $\alpha = 0.89$, $M = 4.25$, $SD = 1.35$; Post-advice attitude: $\alpha = 0.89$, $M = 4.74$, $SD = 1.19$). As before, more positive numbers indicate that participants’ attitude became more positive after receiving the physician’s advice.

Negative emotional experience—Participants rated to what extent they felt, anxious, sad, fearful, right or wrong about advice during the conversation with the physician when he provided advice on a seven point Likert scale ($1 = not at all$, $7 = very much$). 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, we ran a 2(regulatory fit: fit; non-fit) $\times$ 2(initial attitude: negative; positive) regression 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 3 shows, for participants with an initially positive attitude, there was no effect of non-fit on attitude change improvement ($M_{fit} = 0.05$, $SD_{fit} = 0.78$; $M_{non-fit} = -0.03$, $SD_{non-fit} = 0.84$; $\beta = 0.11$, $t < 1$). However, consistent with our hypothesis (H1), for participants with an initially negative attitude, there was an effect of regulatory non-fit on attitude change improvement ($\beta = -0.32$, $t = 2.15$, $p = .03$, 95% CI [-0.62, -0.03]) whereby participants had more attitude improvement in the non-fit condition ($M_{non-fit} = 0.58$, $SD_{non-fit} = 0.67$) than in the fit condition ($M_{fit} = 0.26$, $SD_{fit} = 0.62$). As expected, 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, $\beta = 0.04$, $t(268) = 1.58$, $p = .11$. Furthermore, the analysis of the interaction: initial attitude continuous (5 items averaged) $\times$ 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 our conceptualization that the strength of initial attitude matters for observing the non-fit effect.

Negative emotional experience—To explore the effect of regulatory non-fit on negative emotional experience, we ran a 2(regulatory fit: fit; non-fit) $\times$ 2(initial attitude: negative; positive) regression using PROCESS procedure Model 1 (Hayes, 2013) on negative emotional experience as the dependent variable. As expected (albeit marginally significant) and shown on Figure 4, participants who had an initial negative attitude toward hospice care

experienced 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 ($M_{fit} = 5.55$, $SD_{fit} = 0.98$). Also as expected, 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 $[-1.29, 0.16]$.

Hospice care choice—There was a significant effect of initial attitude on the proportion of individuals who accepted the physicians' advice and chose hospice care ($\chi^2 = 43.37$, $p < .001$). Supporting our dichotomization of participants into positive versus negative initial attitude, we found that 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 in the initial negative attitude condition 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—We next 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, we 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, ($\beta = -0.57$, $t = -2.10$, $p = .04$, 95% CI $[0.03, 1.11]$), consistent with our finding above. In addition, the relationship between regulatory non-fit/fit conditions and choice of hospice was also significant ($\beta = 1.38$, $z = 2.46$, $p = .01$, 95% CI $[-2.49, -0.28]$), whereby participants who experienced regulatory non-fit were more likely to chose 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% CI $[-1.25, -0.04]$. After accounting for this indirect effect, the direct effect between the regulatory non-fit condition and hospice choice was not significant, $\beta = 1.12$, $z = 1.87$, $p = .06$, 95% CI $[-2.29, 0.05]$ suggesting that the reduction in negative emotion fully mediated the positive relationship between regulatory non-fit and choosing hospice.

Discussion

Supporting our hypothesis and consistent with the results of Study 1, we found that participants with an initially negative attitude toward hospice improved their attitude more if they received advice in a regulatory non-fit (vs. fit) manner. Adding to Study 1, we found evidence 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 our results from Study 1 by suggesting that our finding hold across participants for whom an initially negative attitude toward hospice is based on real life experiences rather than on experimentally manipulated. We had to adjust our methodology to identify participants with an initial negative attitude toward hospice because most participants with actual real life experience with hospice had a positive attitude toward it. In retrospect, this is not surprising given that families in which a relative was on 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).

Study 3

In this study, we repeated the procedure of Study 2 but changed the medical context to explore whether our results may be generalizable across different medical settings. Specifically, we examined the effect of regulatory non-fit on attitude change improvement in the setting of early stage prostate cancer, another medical setting in which physicians may wish to recommend a potentially frightening but beneficial treatment option (in this case, active surveillance). As a brief background, early stage prostate cancer is a slow growing tumor, and patients usually choose between two distinct actions: to treat their cancer right way or keep it under surveillance with blood tests and biopsies, intervening only if indicated. There are pros and cons to each of the treatment options. Active treatment is associated with side effects that include erectile dysfunction (impotence), urine incontinence, and bowel movement issues. Surveillance of the cancer does not have immediate complications, but there is a small chance that the cancer could spread out of the prostate and impact the effectiveness of future treatments (Cooperberg, Carroll, & Klotz, 2011). As a result, fear of the cancer worsening is the main reason to reject surveillance (van den Bergh et al., 2009). Men with low and intermediate cancer feel often more psychologically comfortable pursuing treatment even though it causes significant side effects that influence their functional states and their social lives (Fagerlin, Zikmund-Fisher, & Ubel, 2005). In these situations, it may be beneficial to decrease patients' negative evaluation of the potentially frightening option – surveillance of cancer. We proposed that regulatory non-fit between physicians' advice for surveillance and patients' regulatory orientation may help to accomplish this goal. As in Studies 1–2, the following hypothesis were 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.

Method

Participants—A total of 218 American Mechanical Turk workers participated in our study for monetary compensation. In order to ensure participants involvement, we provided information about prostate cancer and in addition, we controlled recruitment ensuring that the scenario would be highly relevant to the participants. Only male participants who were 45 years⁴ or older were allowed to enter our study. We excluded 4 participants who did not

answer the question about their gender and 4 participants who reported female gender. Thus, there were 210 participants in our analyses (100% Male, $M_{age} = 52.16$, $SD = 7.46$).

Procedure—Upon entering the survey, participants read about prostate cancer and were asked to imagine that they were diagnosed with early stage prostate cancer, which had a 20% chance of spreading outside the prostate. Participants received information that described the two main treatment options available to them: cancer treatment and active surveillance, including the pros and cons of each treatment option. Participants then reported their initial attitude toward active surveillance. As in previous studies, we manipulated participants' regulatory focus using the method of Higgins et al. (1994) and the framing of the physicians' advice for active surveillance (emphasizing gains vs. avoiding losses).

Participants were told to imagine that they carefully considered each option and decided to follow their physician's advice and choose surveillance. Participants' post-advice attitude toward surveillance was measured. Since we told participants that they decided to follow their physician's advice as in Study 1, we also asked participants to what extent they trusted in the physician's expertise in this scenario. Finally, participants reported their demographics.

Measures

Fit and non-fit conditions—As in previous studies, participants were assigned to the regulatory fit and non-fit conditions as a function of whether the framing of the physician's advice for hospice matched their regulatory focus (both manipulated).

Initial attitude—As in Study 2, we created a categorical variable to distinguish participants who had an initially negative (vs. positive) attitude. We subtracted participants' scores on a negatively worded attitude item (Active surveillance makes people's life worse) from their scores on a positively worded attitude item (Active surveillance makes people's life better). Participants were classified as having an initially positive attitude if their score on this variable was positive ($n = 157$, $M = 5.50$, $SD = 0.86$) and as having an initially negative attitude if their scores on this variable was negative ($n = 53$, $M = 3.40$, $SD = 0.99$).

Attitude change improvement—As in previous studies, we created a continuous measure of "attitude change improvement" by subtracting participants' initial attitude toward surveillance from their post-advice attitude toward surveillance ($M = 0.23$, $SD = 0.65$). Both attitude measures were created by averaging scores from five items (Appendix 1) designed to assess attitude toward surveillance. (Initial attitude: $\alpha = .90$, $M = 4.98$, $SD = 1.28$; Post-advice attitude: $\alpha = .85$, $M = 5.21$, $SD = 1.27$). In this scale, more positive numbers indicate that participants' attitude became more positive after receiving the physician's advice.

⁴At this age, physicians recommend patients receive a blood test to screen for cancer. We created these restrictions in order to ensure relevance and therefore, involvement of our participants in the hypothetical vignette. <https://www.mskcc.org/cancer-care/types/prostate/screening/screening-guidelines-prostate>

Results

Attitude change improvement—As in the previous studies, to explore the effect of regulatory non-fit, we ran a 2(regulatory fit: fit; non-fit) $\times$ 2(initial attitude: negative; positive) regression using PROCESS procedure Model 1 (Hayes, 2013) on attitude change improvement as the dependent variable.⁵

There was a significant interaction between regulatory non-fit and initial attitude, $\beta = 0.48$, $t(205) = 2.36$, $p = .02$, 95% CI [0.08, 0.88], indicating that the impact of regulatory non-fit on attitude change differed as a function of participants' initial attitude toward surveillance. For participants with an initially positive attitude, there was no effect of the regulatory non-fit condition on attitude change improvement ($M_{non-fit} = 0.13$, $SD_{non-fit} = 0.81$; $M_{fit} = 0.19$, $SD_{fit} = 0.65$; $\beta = 0.06$, $t < 1$). However, consistent with our hypothesis and shown in Figure 6, for participants with an initially negative attitude, there was an effect of regulatory non-fit on attitude change ($\beta = -0.42$, $t = -2.38$, $p = .02$, 95% CI [-0.76, -0.07]) whereby participants experienced more attitude change improvement in the non-fit condition ($M_{non-fit} = 0.70$, $SD_{non-fit} = 0.95$) compared to the fit condition ($M_{fit} = 0.29$, $SD_{fit} = 0.46$). Further, we 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], confirming that our 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, $\beta = 0.11$, $t(206) = 1.82$, $p = .07$, 95% CI [-0.01, 0.24], supporting our conceptualization that the strength of the initial attitude matters for the regulatory non-fit effect.

Discussion

Consistent with our prediction and the results of Studies 1 and 2, we found that participants with initially negative attitudes toward hospice experienced more attitude improvement if they received advice in a regulatory non-fit (vs. fit) manner. Our results suggest that the effect of regulatory non-fit on attitude improvement would hold across other medical settings (e.g., prostate cancer) in which physicians need to recommend an initially disliked option.

Study 4

In Study 4, we explored involvement as a boundary condition for our effect of regulatory non-fit on attitude change improvement for individuals with an initially negative attitude. We proposed that, like regulatory fit, regulatory non-fit should work via two different mechanisms depending on participants' level of involvement. We used whether participants' had real life experiences with cancer and hospice care as a proxy for involvement, since participants with experience should be more involved in the decision than those without personal experience.

⁵As in Study 1, trust in the physician's expertise was included as a covariate in this analysis. In the vignette, patients' choice was determined by a physician's advice, therefore trust in the physician's expertise was a significant factor that influenced our dependent variable, attitude change improvement ($r^2 = .03$, $p = .02$).

Similarly to the findings of Avnet et.al (2013), we expected that participants with high involvement would feel more confidence in their initial attitudes if they experienced regulatory fit and less confidence if they experienced regulatory non-fit. Therefore, participants with high involvement and initially negative attitudes will become less confident in that negative attitude if they receive the physician's recommendation in a regulatory non-fit (vs. fit) manner. As a result, they will experience more attitude change improvement than participants with high involvement who received advice in a regulatory fit manner. In contrast, participants with low involvement and initially negative attitudes will be more likely to transfer their "feelings of right" or "feeling of wrong" to the target option. As a result, they will experience more attitude change improvement if they receive the physician's recommendation in a regulatory fit (vs. non-fit) manner. Overall, we expected that 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 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 251⁶ American Mechanical Turk workers were recruited for monetary compensation.

Procedure—The procedure was identical to Study 2.

Measures

Fit and non-fit conditions—As in Studies 1–3, participants were assigned to the regulatory fit and non-fit conditions as a function of whether the framing of the physician's advice for hospice matched their regulatory focus (both manipulated).

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

⁶Two 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 3 standard deviations below the mean. In addition, their attitude change improvement scores were 3 standard deviations higher than the other participants in their groups and more than 4 standard deviations higher than the mean of the entire sample. We believe that 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 our analysis. The 3-way interaction is borderline significant if those outliers are included in the analysis ($\beta = 0.77$, $p = .05$)

(42% Male, $M_{\text{age}} = 46$, $SD_{\text{age}} = 13$) did not have experience with both cancer and hospice care, and they were therefore assigned to the low involvement condition.

Initial attitude—As in Study 2 and 3, we created a categorical measure of initial attitude by subtracting the scores of the negatively worded item from the scores of the positively worded items that were administered before the advice manipulation. 190 participants had positive scores on this variable and were assigned to the initially positive attitude condition ($M = 5.70$, $SD = 0.74$); 59 participants had negative scores on this variable and were assigned to the initially negative attitude condition ($n = 59$, $M = 3.73$, $SD = 0.98$).

Attitude change improvement—As in previous studies, we created a continuous measure of “attitude change improvement” by subtracting participants’ initial attitude toward hospice from their post-advice attitude toward hospice ($M = 0.27$, $SD = 0.73$). Both attitude measures were created by averaging scores from five items (Appendix 1) designed to assess attitude toward hospice. (Initial attitude: $\alpha = .86$, $M = 5.19$, $SD = 1.22$; Post-advice attitude: $\alpha = 0.88$, $M = 5.43$, $SD = 1.09$). 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 regulatory fit condition and attitude change, we conducted a 2(Regulatory Fit: fit; non-fit) $\times$ 2(initial attitude: negative; positive) $\times$ 2(involvement: low; high). See Table 2 for descriptive statistics. The 3-way 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 people with low involvement, there was a marginally significant interaction between regulatory fit condition and initial attitude ($\beta = -0.66$, $t = -1.88$, $p = .06$, 95% CI $[-1.34, 0.03]$), suggesting 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 ($\beta = -0.06$, $t < 1$). However, it is possible that this study is underpowered due to low sample size in the group of participants with negative initial attitude.

Internal meta-analysis—Given the low power of Study 4 due to imbalanced groups, we conducted an internal meta-analysis across Study 2 and Study 4 in order to boost the statistical power and achieve a more precise estimation (Cumming, 2013). As noted above, although we 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, we classified those individuals as low involvement and thus Studies 2 and 4 were virtual replications of each other. First, we standardized attitude change within each study and then aggregated the two datasets ($N = 562$).

To explore whether involvement moderates the relationship between regulatory non-fit condition and attitude change, we conducted a 2(Regulatory fit: fit; non-fit) $\times$ 2(initial attitude: negative; positive) $\times$ 2(involvement: low; high). See Table 3 for descriptive statistics. With this increase in power, the 3-way interaction was significant, $\beta = 1.16$,

$t(555) = 3.04, p < .01, 95\% \text{ CI } [0.41, 1.91]$ observed power = .86, indicating that the effect of the regulatory fit condition and initial condition on attitude change did, in fact, differ as a function of involvement. Consistent with our predications and the results of Study 1–3, for participants with high involvement, there was a significant interaction between regulatory non-fit and initial attitude on attitude change improvement, $\beta = 0.44, t = 2.11, p = .04, 95\% \text{ CI } [0.03, 0.84]$, where for participants with an initially negative attitude, participants had more attitude improvement in the *non-fit* condition ($M_{\text{non-fit}} = 0.62, SD_{\text{non-fit}} = 1.07$)⁷ compared to the fit condition ($M_{\text{fit}} = 0.21, SD_{\text{fit}} = 1.01$), ($\beta = -0.41, t = 2.25, p = .03, 95\% \text{ CI } [-0.77, -0.05]$). For participants with low involvement, there was also a significant interaction between regulatory non-fit and initial attitude on attitude change ($\beta = -0.72, t = -2.26, p = .02, 95\% \text{ CI } [-1.36, -0.09]$). As expected, in the initial negative attitude condition, participants had more attitude improvement in the *fit* condition ($M_{\text{fit}} = 0.67, SD_{\text{fit}} = 1.03$) compared to the non-fit condition ($M_{\text{non-fit}} = -0.10, SD_{\text{non-fit}} = 0.88$). There were no significant relationships in high or low involvement conditions for participants with initial positive attitude.

In the next step, we conducted an analysis that included only participants with a negative attitude ($n = 138$) and found that the following interaction $2(\text{Regulatory fit: fit; non-fit}) \times 2(\text{involvement: low; high})$ was significant, $\beta = -1.18, t(134) = 3.23, p < .01, 95\% \text{ CI } [-1.91, 0.46]$ confirming a moderation effect of involvement (see Figure 7).

Discussion

Using a meta-analysis, we found evidence that, for those participants with an initially negative attitudes, the effect of regulatory fit versus non-fit on attitude change improvement differed as a function of participants' involvement. For participants with high involvement, we replicated our findings in Studies 1–3; 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.

Study 5

In Study 5, we repeated the procedure of Study 1 but changed the recommended option to chemotherapy in order to examine whether the effect of regulatory non-fit on participants' attitudes differed when an active rather than a passive option was recommended (e.g. chemotherapy rather than hospice care). As in Study 1, we manipulated participants' initial attitude and whether advice was given in a regulatory fit versus non-fit manner (by manipulating both regulatory orientation and advice framing). Finally, we standardized participants' choice, asking all participants to imagine that they chose the recommended option (chemotherapy), and we measured choice satisfaction. We expect to observe the same pattern of results as in Study 1. Thus, the hypotheses were the same as in Study 1:

⁷Standardized values are reported.

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: For participants with an initial negative attitude, choice satisfaction will be stronger for participants in the non-fit condition compared to the fit condition.

Method

Participants—A total of 155⁸ ($M_{age} = 33.50$, $SD_{age} = 11$, Male = 32%) American Mechanical Turk workers participated in the on-line survey for monetary compensation. At the beginning of the survey, we prescreened participants to ensure that they did not have experience with both cancer and chemotherapy (which allowed us to experimentally control involvement and manipulate their initial attitudes).

Procedure—To ensure high involvement and 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 Study 1, we 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 4, participants in the initially positive attitude condition read four positive comments and two negative comments about chemotherapy. For the negative attitude condition, we 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 five Likert-scale questions (Appendix 1).

As in Study 1, we then manipulated participants' regulatory focus and the framing of physicians' advice (eagerness vs. vigilance). (Higgins et al., 2003). Participants either received a recommendation for chemotherapy that emphasized gains they could achieve (eagerness) or the losses they could avoid (vigilance) by choosing chemotherapy (see Appendix 2).

All participants were then told to imagine that they carefully considered each option and decided to follow their physician's advice and choose chemotherapy. 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 that revealed that the comments about chemotherapy were fictitious.

⁸In this data set, 24% of participants filled the questionnaire more than one time. Their answers were excluded from the analysis. Due to changes at Mechanical Turk regulations, we 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.

Measures

Fit and non-fit conditions—We used the same procedure as Studies 1–4 to assign participants to the fit and non-fit conditions.

Attitude change improvement—As in previous studies, we created a continuous measure of “attitude change improvement” by subtracting participants’ pre-advice attitude toward chemotherapy from their post-advice attitude toward chemotherapy ($M = 0.02$, $SD = 1.11$). Both attitude measures were created by averaging scores from five items (Appendix 1) designed to assess attitude toward chemotherapy (Initial attitude: $\alpha = 0.86$, $M = 4.28$, $SD = 1.16$; Post-advice attitude: $\alpha = 0.86$, $M = 4.30$, $SD = 1.14$). As in previous studies, more positive numbers indicate that participants’ attitude toward the recommended option (in this case, chemotherapy) became more positive after receiving the physician’s advice for it.

Choice satisfaction—As in Study 1, participants reported their choice confidence, choice satisfaction, and commitment to the chosen option. These three items were rated on a 7-point Likert scale ($1 = \text{not at all to } 7 = \text{very much}$). 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 effect of regulatory non-fit on attitude change improvement as a function of initial attitude, we ran a 2(regulatory fit: fit; non-fit) $\times$ 2(initial attitude: negative; positive) regression using PROCESS procedure Model 1 (Hayes, 2013) on attitude change improvement as the dependent variable. 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, we suspected that the manipulation with attitudes might not equally influence opinion of our participants. In the next step, we ran an analysis with a measured initial attitude rather than manipulated.

Internal analysis of attitude change improvement—We used the initial attitude measure to run the following internal analysis: 2(regulatory fit: fit; non-fit) $\times$ 2(initial measured attitude: negative; positive). 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% CI $[0.02, 0.47]$ ⁹. A further analysis showed that people 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% CI $[-0.67, 0.07]$), compared to the fit condition ($M_{\text{fit}} = 0.62$, $SD_{\text{fit}} = 1.00$). The opposite relationship

⁹As in previous studies in which we 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

was observed for participants with initially positive attitudes ($\beta = 0.27$, $t = 1.46$, $p = .14$, 95% CI $[-0.10, 0.63]$), with participants in the non-fit condition reducing their positive attitude toward chemotherapy slightly more ($M_{non-fit} = -0.84$, $SD_{non-fit} = 1.14$) compared to the participants in the fit condition ($M_{fit} = -0.58$, $SD_{fit} = 0.75$).

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

Discussion

In Study 5, we found relationships consistent with our 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 observed in Study 1 and 5 were similar. However, we also observed some difference between these studies that merits further discussion.

First, we 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 provokes strong emotional responses because it is closely related to thinking about dying (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 are reports in the literature which suggest 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 there participants may already have a relatively positive attitude toward chemotherapy. What is clear is that more research is needed to determine the boundary conditions of regulatory non-fit effects as a function of the intensity of initial attitude. We expect that the regulatory non-fit effect on attitude improvement will be greater for more emotionally negative advice.

Second, in Study 5, we observed the predicted effect when we used participants' measured initial attitude as an independent variable but did not observe the effect, when we used the manipulated initial attitude as an independent variable. Possibly, it is more difficult to manipulate attitudes toward chemotherapy than attitudes toward hospice care. There are more people in the US who have had experience with chemotherapy than hospice care. It is thus likely that many participants had at least some initial knowledge and an initial attitude toward chemotherapy than toward hospice care. As a result, participants' attitudes may have

been less subject to change with our manipulation, and, instead, driven more by their real life experiences with chemotherapy (which was captured in the measured initial attitude variable). Consistent with this notion, we observed that while 40% of participants had misconceptions about hospice care in Study 1, only 20% of participants had misconceptions about chemotherapy in Study 5.

General Discussion

Across five studies, we demonstrated the effect of regulatory non-fit on attitude change improvement in the context of providing advice for a potentially unpleasant or frightening option. We found that when participants had initially negative attitudes toward an option, they were more likely to make it less negative if they experienced regulatory non-fit (vs. fit) between their motivational orientation (promotion vs. prevention) and the physicians' framing of advice (eagerness vs. vigilance) for the initially disliked options. Furthermore, with a meditational analysis in Study 2, we received initial evidence that regulatory non-fit while reducing confidence in own judgments, motivated participants to pay more attention to arguments, such as a medical expert's advice, rather than being biased by irrational negative emotions.

We also identified two boundary conditions for our findings that help to further elucidate the mechanism behind our findings. First, we found that the effect of regulatory fit on attitude change improvement reversed for participants with low involvement. Specifically, when participants with low involvement had an initially negative attitude toward an option, they were more likely to improve their attitude if they experienced regulatory fit rather than non-fit due to transfer of "feeling right" toward their initial evaluations. These findings are consistent with findings of Avnet et al. (2013) regarding there being two different regulatory fit (or non-fit) paths: changing confidence in one's judgments for high involved participants, and creating a feeling that is directly transferred to one's evaluations for low involved participants.

Second, it appears that the effect of regulatory non-fit on attitude change improvement may depend on the strength of participants' initial attitude. In Study 5 (advice for chemotherapy), we observed a weaker effect of regulatory non-fit on attitude change than in its twin Study 1 (advice for hospice care). It is possible that initial negative attitude was more intense toward hospice care than toward chemotherapy, which resulted in a weaker effect of regulatory non-fit on attitude change improvement in Study 5. Future research should aim to explore more specifically the effect of regulatory non-fit on attitude change as a function of initial attitude strength.

Our study 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), we examined attitude *change*, focusing on how the effects of regulatory non-fit on attitude change may differ as a function of initial attitude. In addition, most previous research has focused on how regulatory *fit* improves attitudes (e.g. Bosone, Martinez, & Kalampalikis, 2015; Cesario et al., 2013). Our

research demonstrated that when individuals have initially negative attitudes toward an option, regulatory non-fit can be a more effective way to improve their attitudes.

Our findings have several practical implications, and could be of particular interest to policy makers and professionals who develop training programs for improving communication in the healthcare domain. The high stakes of medical decisions often causes strong negative emotional reactions, particularly toward stigmatized or misunderstood options such as hospice care or active surveillance for prostate cancer. Patients who choose which treatment to receive while in this state of negative attitudes and emotions may choose an option that does not actually meet their goals because these negative reactions may impede their ability to think rationally about their options. Our research demonstrated that regulatory non-fit could be particularly helpful and relevant in these situations. By decreasing negative attitudes, regulatory non-fit may allow patients to think more rationally about their choices such that they can better align their treatment choices with their long-term goals. In addition, our results suggest that regulatory non-fit may have other positive downstream consequences, such as improving choice satisfaction. Future research is needed to explore other potential downstream consequences of regulatory non-fit, both positive and negative. For example, future research could determine if there are conditions in which improving attitude via regulatory non-fit could inadvertently bias participants' choices against their true preferences.

In addition, our findings have practical implications in terms of how 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 initially increase their involvement to a high level prior to providing advice, which would then be given in a regulatory non-fit manner. Why not instead use regulatory fit to improve attitudes by creating a positive "right" feeling toward a target option? Our concern is that this could produce impulsive choices rather than choices based on arguments, expert advice, and careful, rational consideration of the alternatives. Future studies are needed to investigate whether choice satisfaction may differ depending on whether attitude change improvement was achieved via a regulatory fit or non-fit.

Notably, unlike previous research on regulatory fit, we did not find significant differences in attitude change in regulatory fit conditions for participants with an initially positive attitude in Studies 1–3, 5. Specifically, past studies suggest that participants with an initially positive attitude should experience more attitude improvement in the regulatory fit (vs. non-fit) condition. We believe this absence of an effect likely represents a ceiling effect, due to the fact that 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, making them more negative would be difficult because they were already quite negative.

There were several limitations in our study. First, we explored our theoretical propositions in hypothetical situations. At this stage of the research it would be unethical to explore the

proposed intervention in real clinical settings. However, in Study 2, we were able to recruit participants who observed someone having cancer and someone being on hospice care. While reading about getting cancer is different from actually getting cancer, we believe that the observation of other people with a cancer diagnosis would inform our participants about how they might feel in the situations presented in hypothetical vignettes. Furthermore, we specifically explored the difference between participants with and without such experience in Study 4. We expect that participants' behavior and attitude change in our studies would likely mirror their behavior and attitude change in a real-life setting (Ajzen, 2011). At the same time, future research should address this limitation and explore the relationships that we found in real-life settings when physicians need to advise potentially frightening but beneficial options.

Another potential limitation of our research is that we used on-line internet participants (mechanical.turk.com) in our studies. We decided to pursue diverse population of participants who better represent the US population preferences for end-of-life care. People change their preferences toward more aggressive interventions when their age advances and health declines (Winter, Moss, & Hoffman, 2009). Thus, an on-line 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. In addition, there is evidence suggesting that mechanical.turk participants provide reliable behavioral data (Buhrmester, Kwang, & Gosling, 2011; Paolacci & Chandler, 2014; Paolacci, Chandler, & Ipeirotis, 2010).

In conclusion, we demonstrated that if an unpleasant or potentially frightening option has to be recommended, de-intensification of a negative evaluation through mismatching (creating regulatory non-fit) patients' personal goal orientations (promotion vs. prevention) and the focus of physician advice (gains vs. losses) 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.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Attitude improvement as a function of the induced initial attitude conditions and having a non-fit or fit advice message (Study 1).

** $p < .01$

Figure 2.
Choice satisfaction as a function of attitude condition and having a fit or non-fit advice message (Study 1).

* $p < .05$

Figure 3.

Attitude improvement as a function of the measured initial attitude conditions and having a non-fit or fit advice message (Study 2).

* $p < .05$

Figure 4.

Negative emotional experience during the conversation about hospice as a function of initial measured attitude toward hospice and a regulatory fit/non-fit advice message (Study 2).

+ $p < .10$

Figure 5. Negative emotional experience mediates the relationship between regulatory fit condition and choice of hospice (for participants with an initial negative attitude toward hospice) Study 2.
* $p < .05$

Figure 6.

Attitude change improvement about active cancer surveillance as a function of initial attitude and having a fit or a non-fit advice message (Study 3).

* $p < .05$

Figure 7.

Attitude change improvement toward hospice as a function of involvement (low vs. high), whether physicians' advice was given in a regulatory fit (vs. non-fit) manner for participants with initial negative attitude ($n=134$). (Study 4).

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

Figure 8.

Attitude change improvement as a function of the measured initial attitude conditions and having a fit or non-fit advice message for chemotherapy (Study 5).

+ $p < .10$

Table 1

Comments used to standardized knowledge about hospice care and manipulate participants' initial attitude toward hospice care (Study 1).

Initial positive attitude condition	Initial 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.	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.
<i>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>	<i>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>
I worked with people who had chosen hospice. They were very well cared for and often were together with family or hospice worker.	I worked with people who had chosen hospice. They were not well cared for and often were alone without family or hospice worker.
<i>We made 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.</i>	<i>We made 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.</i>
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.	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 positive experience. It gave them quality of life. They were taken care of and monitored closely.	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 quality of life. They were not taken care of or monitored closely.

Table 2

Attitude change as a function of involvement, regulatory non-fit, and initial positive and negative attitude (Study 4).

			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
Total			4.95	91	1.15	0.28	91	0.54
			3.50	12	1.19	0.60	12	0.76
High Involvement	Negative Attitude	Non-Fit						
		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
Total			5.42	158	1.12	0.19	158	0.60

^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. We report analysis without these two outliers.

Table 3

Attitude change as a function of involvement, regulatory non-fit, and initial positive and negative attitude (meta-analysis; Study 4).

	Initial Attitude			Attitude Change		
	Mean	N	SD	Mean	N	SD
Low involvement						
Negative Initial Attitude	Non-Fit	3.50	25	1.15	0.24	25
	Fit	3.35	21	0.79	0.79	21
Positive Initial Attitude	Non-Fit	5.52	47	0.71	0.21	47
	Fit	5.42	40	0.71	0.24	40
High involvement						
Negative Initial Attitude	Non-Fit	3.67	43	0.94	0.59	43
	Fit	3.96	49	0.94	0.34	49
Positive Initial Attitude	Non-Fit	5.72	160	0.74	0.09	160
	Fit	5.75	178	0.79	0.1	178

Table 4

Comments used to inform participants about chemotherapy experience and manipulate participants' initial attitude toward chemotherapy (Study 5).

Initial positive attitude condition	Initial negative attitude condition
My brother was diagnosed with cancer and chose to undergo chemotherapy. It had positive results within a year of starting the therapy	My brother was diagnosed with cancer and chose to undergo chemotherapy. It had no positive results within a year of starting the therapy
<i>I have had friends who have done chemo and regretted it</i>	<i>I have had friends who done have chemo and never regretted it</i>
My uncle decided to try chemotherapy to extend his life hopefully. It worked and he was not that sick most of the time.	My uncle decided to try chemotherapy to extend his life hopefully. It didn't work and he was very sick most of the time.
My dearest friend chose chemo as a treatment and this led to lower quality of life but had positive lasting effects.	My dearest friend chose chemo as a treatment and this led to lower quality of life and did not have any positive lasting effects.
<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>	<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>
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.	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.