Individual Differences in Sensitivity to Health Communications: Consideration of Future Consequences

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There are reliable individual differences in the extent to which people consider the long- and short-term consequences of their behaviors. Such differences, assessed by the Consideration of Future Consequences (CFC) Scale (A. Strathman, F. Gleicher, D. S. Boninger, & C. S. Edwards, 1994), are hypothesized to influence the impact of a persuasive communication. In an experimental study, the time frame of occurrence of positive and negative consequences of engaging in a new colorectal cancer-screening program was manipulated in a sample of two hundred twenty 50–69-year-old men and women. CFC moderated (a) the processing of short- versus long-term consequences and (b) the persuasive impact of the different communications on behavioral intentions. Low CFC individuals produced more positive thoughts and were more persuaded when positive consequences were short term and negative consequences were long term. The opposite was true for high CFC individuals.

Key words: consideration of future consequences, colorectal cancer screening, individual differences, persuasion, health communication, theory of planned behavior

People differ in the weight they attach to short- and long-term outcomes of their behaviors. The present article takes as its starting point the assumption that these individual differences will guide the processing of a health-related communication and, consequently, the persuasive impact of that communication. The Consideration of Future Consequences (CFC) Scale (Strathman, Gleicher, Boninger, & Edwards, 1994) provides a reliable and valid measure of this individual difference construct and is utilized here in an experimental investigation.

Previous research has adopted a number of different approaches to the issue of designing effective health communications, including personally tailoring message content (e.g., Kreuter, Bull, Clark, & Oswald, 1999; Skinner, Strecher, & Hospers, 1994), framing in terms of losses versus gains (e.g., Detweiler, Bedell, Salovey, Pronin, & Rothman, 1999; Meyerowitz & Chaiken, 1987; Schneider et al., 2001), or priming in terms of risky groups versus risky behaviors (e.g., Spears, Abraham, Abrams, & Sheeran, 1992). Studies have also examined the role of characteristics of behavior, such as whether it involves detection or prevention of ill health, and characteristics of the individual, such as degree of personal involvement with the health issue (e.g., Rothman & Salovey, 1997; Rothman, Salovey, Antone, Keough, & Martin, 1993). The present article addresses a further aspect of health communications: the temporal frame in which the costs and benefits of a health-related behavior might occur and the relationship of individual differences in CFC to the persuasive impact of different temporal frames.

We examine these processes in the context of an important current health issue, proposals to introduce screening to prevent mortality from colorectal cancer among a community sample of 50–69-year-old men and women, for whom the issue might be considered to be relevant and involving. Colorectal cancer presents a major threat to public health, being the third most prevalent cancer among both men and women in the United States and the United Kingdom, and accounts for 34,000 newly diagnosed cancers in the United Kingdom each year (American Cancer Society, 2002; Garvican, 1998). In the United Kingdom, the Department of Health is currently piloting the possible introduction of nationwide screening for colorectal cancer using the fecal occult blood test. Because this form of screening may be made available to the general population in the next few years (O'Sullivan & Orbell, 2004; Weitzman, Zapka, Estabrook, & Goins, 2001), it is timely to initiate research that might contribute to effective health promotion.

Individual differences in the extent to which a person considers the short- or long-term outcomes of his or her actions do not merely represent a preoccupation with the future, but a cognitive mind-set that determines the extent to which an individual is influenced by potential immediate and distant outcomes in deciding how to act. When confronted with a behavioral decision, with one set of immediate outcomes and one set of longer term outcomes, the resolution of this dilemma is proposed to be a relatively stable individual characteristic. Individuals who are low on CFC are expected to focus more on immediate needs and concerns and to act accordingly, whereas individuals high on CFC are expected to focus more on the future implications of their behavior and to use these longer term outcomes as guides to their behavioral decision making. At the extremes, low CFC individuals may completely disregard long-term outcomes and high CFC individuals may completely disregard short-term outcomes (Strathman et al., 1994).
People scoring higher on CFC have been shown to be more likely to engage in proenvironmental political behavior (Joireman, Lasane, Bennett, Richards, & Solaimani, 2001; Joireman et al., 2001; Strathman et al., 1994, Study 1) and proenvironmental consumer behavior (Lindsay & Strathman, 1997), have higher academic achievement (Joireman, 1999), and be less likely to behave competitively in an intergroup context (Insko et al., 1998). However, a literature search did not locate any studies specifically examining the role of CFC in guiding health-related behaviors. Strathman et al. (1994, Study 2) demonstrated that CFC scores predict variance in general health concern and cigarette use over and above other individual difference measures. Research studies using a conceptually similar instrument, the Stanford Time Perspective Inventory (Gonzalez & Zimbardo, 1985; Polak & Zimbardo, 1990), have shown that a future time perspective may be associated with delaying first sexual intercourse (Rothspan & Read, 1996) or not engaging in risky driving (Zimbardo, Keough, & Boyd, 1997). The present study extended this work by examining the implications of CFC for information processing and persuasion in the health domain.

**Consideration of Future Consequences and Temporal Framing of Behavioral Outcomes**

CFC is proposed to guide the processing of information and formation of attitudes and intentions with regard to behavior. A conservative test of the hypothesized consequences of CFC might be afforded if individuals are confronted with information about both positive and negative outcomes of a behavior, but the time frame in which those outcomes are proposed to occur is manipulated. Because if an individual is deciding how to act on the basis of the temporal occurrence of outcomes, he or she should be more likely to be influenced by the time frame in which those outcomes occur than by whether those outcomes are positive or negative. Strathman et al. (1994, Study 1) manipulated the time frame of occurrence of positive and negative outcomes of increased oil drilling and obtained evidence that the interaction of CFC with time frame influenced attitudes in line with theoretical predictions. Low CFC participants favored increased offshore drilling more than its advantages, rather than its disadvantages, were portrayed as immediate. High CFC participants favored increased offshore drilling more when its advantages were portrayed as distant and its disadvantages as immediate. We sought in the present study to extend this analysis to the health domain. Moreover, whereas Strathman and colleagues examined attitude toward an environmental policy, a more precise test might involve a behavioral decision regarding personal behavior with rather more direct personal consequences.

Virtually all health-related behaviors may be considered to possess associated positive and negative outcomes (Wilson, Purdon, & Wallston, 1988). Indeed, consideration of costs and benefits is fundamental to theoretical accounts of health-related decision making, such as the Health Belief Model (Janz & Becker, 1984) and the Protection Motivation Theory (referred to as response costs and response efficacy; Rippetoe & Rogers, 1987; Rogers, 1975). Studies of screening behaviors show that a variety of costs, such as aversive aspects of a test procedure or risk of a positive result, and benefits, such as early treatment of abnormalities, reduced risk of mortality from cancer, and peace of mind about cancer, are associated with both intentions and actual uptake of screening (e.g., Orbell, Crombie, & Johnston, 1996; Orbell, Crombie, Robertson, Johnston, & Kenicer, 1995; Orbell & Sheeran, 1993, 1998; Rutter, 2000). We theorized that if the time frame in which these positive and negative outcomes were described to occur was manipulated to be either immediate or lasting for years, we might show that low CFC respondents are more persuaded and more likely to intend to undergo screening when positive outcomes are described as immediate and negative outcomes are long term. Conversely, we anticipated that high CFC respondents would be more persuaded and more likely to intend to undergo screening when positive outcomes are described as long term and negative outcomes are immediate.

An important issue for research concerning health communications is to understand how they might influence intentions and behaviors. Several studies involving different types of health communication have failed to demonstrate effects on intentions or their proximal determinants (Rothman & Salovey, 1997; Wilson et al., 1988). Strathman et al. (1994) demonstrated that their manipulation of time frame influenced individual item measures of attitude toward increased oil drilling. We seek to extend this finding by assessing attitude, subjective norm, and perceived behavioral control from the theory of planned behavior (Ajzen, 1985, 1991, 2001), which all have been previously demonstrated to predict intentions and actual screening behavior (e.g., cervical screening: Sheeran & Orbell, 2000; breast screening: Rutter, 2000) as potential mediators of the effects of temporal framing on behavioral intention.

In this study, we evaluated the role of time frame and individual differences in CFC in the context of behavioral intention to take part in screening for colorectal cancer if it were offered. Because we examined behavioral intentions among a community sample of 50–69-year-olds, in which there is a high incidence of colorectal cancer, we expected our sample to be positively disposed toward participation. We also expected that CFC would exert a main effect on participants’ responses. Because screening aims to prevent long-term risk of bowel cancer, we hypothesized that people higher in CFC would be more likely to endorse arguments in favor of the long-term benefits of screening and would hold more positive intentions to participate. We further anticipated that the main effect of individual differences in CFC would be moderated by the temporal frame in a persuasive communication. We expected that high CFC participants would be more favorable in their comments and more likely to intend to participate when the positive consequences of screening were framed as long term and the negative consequences were framed as short term, and that low CFC participants would be more favorably disposed toward screening when presented with short-term positive and long-term negative consequences. Our final hypothesis concerned the mediation of intention. We hypothesized that the effects of CFC and the time frame manipulation would influence intention by proximal

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1 Health screening in the United Kingdom is funded nationally and organized locally by the National Health Service. Health care is free at the point of delivery. Thus, if screening to prevent mortality from colorectal cancer were to be rolled out following the ongoing pilot, men and women aged 50–69 years would be sent individual invitations to participate.
effects on attitude, subjective norm, and perceived behavioral control from the theory of planned behavior.

Method

A community sample of 220 men (n = 83) and women (n = 137) in the target age range for colorectal cancer screening (50–69 years, M = 57.96 years, SD = 1.63) were recruited to the study by means of door-to-door house calls in one United Kingdom town and randomly allocated to one of the experimental conditions. All house calls were made within a 2-mile radius of the university campus. Households were approached systematically. Initially, the researcher inquired whether anyone residing in the house was in the target age range. If no one was available in the target age range, the researcher moved on to the next household. Fifteen percent of the sample was retired. On the basis of present and previous occupation history, 20% were of Social Class 1 or 2 (professional), 28% of Class 3 (skilled), 16% of Class 4 or 5 (unskilled), and 36% described themselves as long-term homemakers.

Participants were asked to take part in a study of their views about a proposed new screening program for bowel cancer. A questionnaire booklet was left with participants to complete and collected a few days later. Questionnaires were returned by 88% of age-eligible individuals. A 2 (time frame) × 2 (order) × 2 (CFC) design was used to test the study hypotheses. Time frame and order effects were manipulated, whereas CFC was a measured variable. As an initial check on the relevance of the issue, participants were asked the following questions on a 4-point scale:

- How much thought do you generally give to your health?
- How much thought do you generally give to getting cancer? (none at all– quite a lot).

Manipulations

Each version of the questionnaire contained one of four short passages about bowel cancer screening, preceded by the instruction, “Now please read this paragraph.” All four versions began by describing the prevalence of bowel cancer and explaining that population screening for people aged 50–69 years was currently being considered by the National Health Service. Each of the passages contained two possible positive consequences of taking part in screening and two possible negative consequences of taking part in screening. Although the same consequences were presented in each passage, we manipulated the time frame of these consequences. In one time frame, the negative consequences were presented as short term and the positive consequences were presented as long term. In the second time frame (shown in brackets in the following passage), the positive consequences were presented as short term and the negative consequences as long term:

Bowel cancer (colorectal cancer) is one of the most common cancers amongst men and women aged over 50. In the next 2 years the NHS may be offering all people over 50 an opportunity to take part in screening to detect any early signs of this cancer. Some people find that taking part in screening means that they may worry and have to undergo unpleasant procedures immediately. Some people find that taking part in screening gives them peace of mind about bowel cancer for years into the future. They also know that any treatment they may have needed years before was done when it was most likely to be effective. [Some people find that taking part in screening gives them immediate peace of mind about bowel cancer. They also know that any treatment they may need is being done when it is most likely to be effective. Some people find that taking part in screening means that they worry and have to undergo unpleasant procedures for years into the future.]

We also manipulated the order in which the positive and negative consequences were presented within each time frame manipulation, to control for order effects.

Thought Listings

Immediately after reading the time frame manipulation, participants were asked to “write down the thoughts that came to mind as you read the passage above.” Two lines were provided below this instruction for thought listings. The number of positive and negative thoughts generated by participants immediately after reading the passage about bowel screening were coded and analyzed by two independent raters (Sheina Orbell and Marco Perugini), one of whom was unaware of the study hypotheses. Positive thoughts were defined as any thought representing a positive evaluative orientation toward bowel cancer screening, and negative thoughts represented a negative evaluative orientation. Neutral thoughts were excluded. Interrater reliability was satisfactory (k = .91 for positive thoughts and .77 for negative thoughts, both ps < .001).

Theory of Planned Behavior Measures

After completing the thought listings, participants responded to a series of items, presented in random order (cf. Sheeran & Orbell, 1996) to assess constructs specified by the theory of planned behavior. Six-point Likert scales were used to assess each of the dependent variables (attitude, subjective norm, perceived behavioral control and intention). Attitude was assessed by the item, “Taking part in bowel cancer screening if it were offered to me in the next two years;” answered on scales from worthwhile–worthless, necessary–unnecessary, good–bad, important–unimportant, pleasant–unpleasant, beneficial–harmful, desirable–undesirable, and nice–nasty. Subjective norm was assessed by three items: “Most people who are important to me would think I should take part in bowel cancer screening if it were offered to me in the next two years,” “Most people who are important to me would encourage/discourage me about taking part in bowel cancer screening in the next two years,” and “Most people who are important to me would approve/disapprove of my taking part in bowel cancer screening if it were offered to me in the next two years,” answered on scales from strongly agree–strongly disagree, strongly encouraging–strongly discouraging, and strongly approving–strongly disapproving, respectively. Four items assessed perceived behavioral control: “I am confident that I could take part in screening for bowel cancer if it were offered to me in the next two years,” answered on a scale from very sure I could–very unsure if I could, “For me to take part in screening for bowel cancer in the next two years, if it were offered to me, would be . . .” answered on a scale from very easy–very difficult; “For me to take part in screening for bowel cancer in the next two years, if it were offered to me, would be . . .” answered on a scale from very easy–very difficult; “For me to take part in screening for bowel cancer in the next two years, if it were offered to me, would be . . .” answered on a scale from very easy–very difficult; “How likely is it that you would take part in screening for bowel cancer if it were offered to you in the next two years?” (very likely–very unlikely); “I intend to take part in screening for bowel cancer if it were offered to me in the next two years” (definitely intend–definitely do not intend).

Consideration of Future Consequences

The final part of the questionnaire assessed consideration of future consequences by means of the 12-item CFC measure reported by Strathman et al. (1994). Respondents were required to indicate to what extent each item characterized themselves on a 5-point Likert-type scale ranging from 1 (extremely uncharacteristic) to 5 (extremely characteristic). Example items are as follows: “I often consider how things might be in the future and try to influence those things with my day to day behavior,” “I only act to satisfy immediate concerns, figuring the future will take care of itself,” and “I think that sacrificing now is usually unnecessary since future
outcomes can be dealt with at a later time.” The scale showed high internal reliability (α = .80, .82, .86, and .81 in four college samples) and test-retest reliability (r = .76 over 1 week and r = .72 over 5 weeks), as well as good convergent and discriminant validity.

Results

Men and women were equally distributed across experimental conditions, \( \chi^2(3, N = 220) = 3.38, n.s. \) and there was no age difference between conditions, \( F(3, 216) = 0.26, n.s. \) Only 1.8% of the sample reported giving no thought to health (27.3% difference between conditions, \( t = 5.65, p < .05. \) This finding suggests that CFC may decrease with age. Consistent with this proposal, the sample mean obtained here (3.20) among 50–69-year-olds was lower than that obtained among a sample of commuters with an average age of 38 years by Joireman, Van Lange, et al. (2001; mean average score = 3.87) and that obtained among a college sample (Joireman, Lasane, et al., 2001; mean average score = 4.84).

**Effects of the Manipulations on Thought Listings**

Participants generated between 0 and 4 thoughts (\( M = 1.26 \) thoughts, \( SD = 0.93 \)) about screening. Positive thoughts had a mean of 0.82 (\( SD = 0.87, range = 0–4 \)) and negative thoughts had a mean of 0.44 (\( SD = 0.66, range = 0–3 \)). If our manipulations have been successful, we would anticipate that high CFC participants should be more likely to pay attention to long-term consequences and to disregard short-term consequences. These participants might therefore be expected to generate more positive thoughts and fewer negative thoughts when confronted with information about long-term positive consequences and short-term negative consequences. In contrast, low CFC participants should be more likely to pay attention to short-term consequences and to disregard long-term consequences. These participants would be expected to generate more thoughts that are positive and fewer negative thoughts when confronted with information about short-term positive consequences and long-term negative consequences. A 2 (time frame: long-term positive or short-term positive) \( \times \) 2 (order: positive first or negative first) \( \times \) 2 (type of thoughts: positive or negative) mixed analysis of variance (ANOVA) was conducted in which type of thoughts was treated as a within-participant measure. The ANOVA revealed first that participants generated more positive (\( M = 0.82, SD = 0.87 \)) than negative (\( M = 0.44, SD = 0.66 \)) thoughts about bowel cancer screening, \( F(1, 212) = 23.13, p < .01, \) consistent with a generally positive view of screening. A CFC \( \times \) Type of Thought interaction, \( F(1, 212) = 10.39, p < .05, \) showed that high CFC participants generated more positive (\( M = 1.03, SD = 0.88 \)) than negative thoughts (\( M = 0.62, SD = 0.82 \)). Of importance, we also obtained the predicted Type of Thoughts \( \times \) CFC \( \times \) Time Frame interaction, \( F(1, 212) = 5.70, p < .05. \) Figure 1 shows the difference between the number of positive and negative thoughts generated by high and low CFC participants in each of the conditions. Although high CFC participants generated more positive thoughts overall, they generated more positive relative to negative thoughts in the long-term, positive consequences condition. This is consistent with the view that they were less likely to disregard negative consequences in the long-term, negative consequences condition. Low CFC participants, as expected, generated a majority of positive thoughts in the short-term positive condition. When confronted with information concerning long-term positive consequences, they were apparently unable to avoid paying attention to short-term negative consequences and disregarded the long-term, positive consequence information, resulting in a majority of negative thoughts about bowel cancer screening. These findings indicate the success of our manipulations. No significant order effects were obtained in these or any of the subsequent analyses; they are not discussed.

To explore further the nature of thoughts generated by the persuasive communications, we examined the proportions of participants listing two specific types of thought concerning the nature of behavior under consideration. Overall, the most common negative thought generated concerned the risk of detecting something wrong. Typical thoughts included the following: “I would be afraid in case I didn’t get the result I expected,” “I do not feel comfortable thinking about cancer,” “Why should we know if we have cancer? To ruin our hopes for living?” and “If you don’t know, then you can just ignore.” The most commonly generated positive thought concerned the benefits of screening. Specific examples included the following: “It might help people ensure good health for the future.” “By having the test it can save your life,” and “It’s better to know than not know so you can have effective treatment.” These thoughts typify the distinction between viewing screening as a risky behavior, with short-term risky consequences, and viewing screening as a preventive behavior, with long-term benefits. Inter-rater reliability for these specific thoughts was satisfactory (\( \kappa = 0.62, SD = 0.88 \)) than low CFC individuals (\( M = 1.11, SD = 0.95, F(1, 212) = 5.65, p < .05. \) Participants in the short-term positive, long-term negative consequences condition also produced more thoughts (\( M = 1.38, SD = 0.99 \)) than those in the short-term negative, long-term positive condition (\( M = 1.13, SD = 0.85, F(1, 212) = 4.20, p < .05. \)

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2 As an additional check on the reliability of the coding of thought listings, we replicated the ANOVA reported here using codes assigned by the second independent rater. We obtained a main effect of positive versus negative thoughts, \( F(1, 212) = 40.57, p < .01, \) a CFC \( \times \) Type of Thought interaction, \( F(1, 212) = 8.35, p < .05, \) and the important Type of Thought \( \times \) CFC \( \times \) Time Frame interaction, \( F(1, 212) = 5.09, p < .05. \) These findings exactly replicate those obtained using the first rater’s codings.

3 The MANOVA also produced significant main effects of CFC and temporal order. High CFC individuals generated more thoughts (\( M = 1.41, SD = 0.89 \)) than low CFC individuals (\( M = 1.11, SD = 0.95, F(1, 212) = 5.65, p < .05. \) Participants in the short-term positive, long-term negative consequences condition also produced more thoughts (\( M = 1.38, SD = 0.99 \)) than those in the short-term negative, long-term positive condition (\( M = 1.13, SD = 0.85, F(1, 212) = 4.20, p < .05. \)
thoughts: risk of detection or benefits of prevention) about the preventive benefits of screening (The ANOVA revealed that participants generated more thoughts than about the risks of detection (M = 0.24, SD = 0.43) than about the risks of detection (M = 0.14, SD = 0.35), F(1, 212) = 6.21, p < .05. A CFC × Type of Thoughts interaction, F(1, 212) = 4.51, p < .05, showed that high CFC individuals were more likely to generate thoughts about the preventive benefits of screening (M = 0.29, SD = 0.45) than about the risks of detection (M = 0.11, SD = 0.31). Most important, we obtained a significant CFC × Time Frame × Types of Thought interaction, F(1, 212) = 7.22, p < .01. Figure 2 illustrates this interaction by showing the percentage of participants generating each type of thought by CFC and message type. The figure shows the impact of temporal frame on participants’ evaluations of screening. When positive outcomes were framed as short term, low CFC individuals were more likely to generate thoughts about the benefits of screening, but when positive outcomes were framed as long term, low CFC individuals were more likely to focus on fears of detection, a negative short-term outcome. The opposite was true for high CFC individuals who were more likely to think about benefits when positive outcomes were framed as long term, but who focused on risks of detection when confronted with information concerning this long-term negative outcome. These findings indicate that the temporal frame in which possible negative or positive consequences are presented can dramatically alter an individual’s evaluation of screening as representing a net risk or a net gain.

Effects of the Manipulations on Theory of Planned Behavior Measures

Reliability of each of the variables (attitude, subjective norms, perceived behavioral control, and intention) was satisfactory (as = .79, p < .01 and κ = .79, p < .01 for preventive and risky thoughts, respectively).4

We conducted a 2 (time frame: long-term positive or short-term positive) × 2 (order: positive first or negative first) × 2 (type of thoughts: risk of detection or benefits of prevention) × 2 (CFC: high or low) mixed ANOVA in which risk of detection versus benefits of prevention was treated as a within-participant variable. The ANOVA revealed that participants generated more thoughts about the preventive benefits of screening (M = 0.24, SD = 0.43) than about the risks of detection (M = 0.14, SD = 0.35), F(1, 212) = 6.21, p < .05. A CFC × Type of Thoughts interaction, F(1, 212) = 4.51, p < .05, showed that high CFC individuals were more likely to generate thoughts about the preventive benefits of screening (M = 0.29, SD = 0.45) than about the risks of detection (M = 0.11, SD = 0.31). Most important, we obtained a significant CFC × Time Frame × Types of Thought interaction, F(1, 212) = 7.22, p < .01. Figure 2 illustrates this interaction by showing the percentage of participants generating each type of thought by CFC and message type. The figure shows the impact of temporal frame on participants’ evaluations of screening. When positive outcomes were framed as short term, low CFC individuals were more likely to generate thoughts about the benefits of screening, but when positive outcomes were framed as long term, low CFC individuals were more likely to focus on fears of detection, a negative short-term outcome. The opposite was true for high CFC individuals who were more likely to think about benefits when positive outcomes were framed as long term, but who focused on risks of detection when confronted with information concerning this long-term negative outcome. These findings indicate that the temporal frame in which possible negative or positive consequences are presented can dramatically alter an individual’s evaluation of screening as representing a net risk or a net gain.

Figure 1. Difference between number of positive and number of negative thoughts generated as a function of Consideration of Future Consequences Scale (CFC) and time frame. In the short-term positive (ST+) condition, long-term negative (LT-) condition, positive consequences were short term and negative consequences were long term. In the long-term positive (LT+), short-term negative (ST-) condition, positive consequences were long term and negative consequences were short term.

Figure 2. Percentages of participants listing risk of detection and benefits of early treatment as a function of Consideration of Future Consequences Scale (CFC) and time frame. In the short-term positive (ST+), long-term negative (LT-) condition, positive consequences were short term and negative consequences were long term. In the long-term positive (LT+), short-term negative (ST-) condition, positive consequences were long term and negative consequences were short term.

.74, .80, .72, and .88, respectively). Scale scores were averaged, giving a score between 1 and 6 for each variable. Intentions to undergo bowel cancer screening were generally positive for the sample as a whole (M = 4.28, SD = 1.21). To test our experimental hypotheses, attitude, subjective norm, perceived behavioral control, and intention from the theory of planned behavior were subjected to a 2 (time frame: long-term positive or short-term positive) × 2 (order: long term first or short term first) × 2 (CFC: high or low) multivariate analysis of variance (MANOVA). We obtained a significant main effect of CFC, F(4, 209) = 5.10, p < .01. Univariate analyses indicated that all of the variables (attitude, subjective norm, perceived behavioral control, and intention) contributed to this effect (Table 1). High CFC individuals were, as expected, more positively disposed toward screening. More important, the interaction of CFC × Time Frame was also significant, F(4, 209) = 4.38, p < .01. Significant univariate effects were obtained for attitude, perceived behavioral control, and intention: F(1, 209) = 11.26, p < .01, F(1, 209) = 5.61, p < .05, and F(1, 209) = 4.67, p < .05, respectively. Figure 3 illustrates, using intention, the pattern of this CFC × Time Frame interaction, which parallels that obtained for the thought listings. The manipulation

4 As an additional check on the reliability of the coding of thought listings, we replicated the ANOVA reported here using codes assigned by the second independent rater. We obtained a main effect of type of thought, F(1, 212) = 12.02, p < .01, an interaction of CFC × Type of Thought, F(1, 212) = 4.37, p < .05, and the important CFC × Type of Thought × Time Frame interaction, F(1, 212) = 6.94, p < .01. These findings replicate those obtained from the first rater’s codings.
containing long-term positive consequences and short-term negative consequences made high CFC individuals more likely to endorse screening and low CFC individuals less likely to endorse screening. Similarly, the manipulation containing short-term positive consequences and long-term negative consequences made the low CFC individuals more likely to endorse screening and high CFC individuals less likely to endorse screening. These findings support our hypotheses.

Mediation of Intention by Attitude, Subjective Norm, and Perceived Behavioral Control

We hypothesized that the effects of the manipulations on intentions to undergo bowel cancer screening would be mediated by effects on the theoretically prior variables (attitude, subjective norm, and perceived behavioral control). The previous analyses have demonstrated that the interaction of CFC × Time Frame predicts attitude and perceived behavioral control, on the one hand, and intention on the other hand. Because we obtained no significant interaction effect on subjective norm in the ANOVA, we do not anticipate that the scores on this measure will mediate intention to undergo screening. To examine these effects, we conducted three separate regression analyses, as specified by Baron and Kenny (1986), in which intention was regressed on CFC and the two experimental conditions were regressed at the first step. At the second step, the interaction of CFC × Time frame was entered. At the third step of each regression model, one of the mediator variables (attitude, subjective norm, or perceived behavioral control) was entered. To satisfy conditions for mediation, the beta value of the independent variable representing the interaction of CFC × Time Frame should be significant at the second step. At the third step, the beta value of the mediator should be significant and the beta value of the independent variable should be reduced to nonsignificance. The findings of these analyses are summarized in Table 2. As anticipated, at the first step, a significant beta value was obtained for CFC (β = .27, p < .01). At the second step, the interaction of CFC × Time Frame was significant (β = .24, p < .05), as shown in column 2 of the table, and contributed additional significant variance to the prediction of intention. The addition of each of the variables (attitude, subjective norm, and perceived behavioral control) each contributed additional variance to the prediction of intention (βs = .44, .69, and .77 respectively, all ps < .01). However, although the addition of attitude and perceived behavioral control (columns 3 and 5) reduced the beta values of the interaction term to nonsignificance (βs = .08 and .04, respectively, both ns), consistent with our mediation hypothesis, the addition of subjective norm (column 4) did not reduce the beta value of this variable (β = .21, p < .05), demonstrating that subjective norm did not mediate the effect of the manipulations but was an independent predictor of intention. This finding is consistent with the differential effects of the manipulations obtained in the univariate analyses.

Discussion

The goal of the present research was to demonstrate that individual differences in the extent to which people consider the long- and short-term outcomes of their current behaviors, as assessed by CFC, have important consequences for the persuasiveness of health-related communications. High CFC individuals were more likely to view participation in colorectal cancer screening as beneficial and held more positive attitudes, subjective norms, perceived behavioral control, and intentions to participate.

The strongest test of the role of CFC was provided by the interaction of CFC with the effects of temporal framing of the outcomes of screening participation. High CFC participants, who weighed long-term outcomes more heavily, were more persuaded when positive outcomes of screening were presented as lasting years into the future and negative outcomes were presented as immediate. In contrast, low CFC participants were more persuaded when positive outcomes were presented as immediate and negative outcomes were presented as occurring years into the future. Evidence from thought listings showed that the interaction of CFC with temporal framing had dramatic effects on the ways in which participants processed information contained in the different messages. Low CFC individuals, confronted with information about short-term negative outcomes, ignored information about long-term benefits and produced a majority of negative thoughts about

<table>
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<th>Variable</th>
<th>Low CFC (n = 114)</th>
<th>High CFC (n = 106)</th>
<th>F(1, 121)</th>
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<tr>
<td>Attitude</td>
<td>4.19  ± 0.73</td>
<td>4.45  ± 0.74</td>
<td>7.02**</td>
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<td>Subjective norm</td>
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<td>4.79  ± 1.03</td>
<td>6.63*</td>
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<td>Perceived behavioral control</td>
<td>4.14  ± 0.91</td>
<td>4.71  ± 0.83</td>
<td>21.97**</td>
</tr>
<tr>
<td>Intention</td>
<td>3.97  ± 1.13</td>
<td>4.61  ± 1.02</td>
<td>16.45**</td>
</tr>
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</table>

Note: CFC = Consideration of Future Consequences Scale.
* p < .05, ** p < .01.

Table 1
Mean Scores on Theory of Planned Behavior Measures by CFC

Figure 3. Intention to undergo bowel cancer screening by time frame and Consideration of Future Consequences Scale (CFC). In the short-term positive (ST+), long-term negative (LT−) condition, positive consequences were short term and negative consequences were long term. In the long-term positive (LT+), short-term negative (ST−) condition, positive consequences were long term and negative consequences were short term.
screening participation, viewing it as risky and psychologically costly. However, of importance, when participation in screening was framed as having short-term positive outcomes, low CFC individuals produced more positive thoughts about screening and were more likely to view it as beneficial. This is an important finding because low CFC individuals are likely to be less motivated to engage in a range of health-related behaviors. The results obtained here suggest that by carefully emphasizing short-term outcomes in a health communication, these individuals may be induced to switch from viewing such behaviors as risky to viewing them as having net benefits.

Several studies have been unable to demonstrate effects of different health-related communications on beliefs and attitudes (Hardeman et al., 2002; Rothman & Salovey, 1997). In the present study, we included measures of attitude, subjective norm, and perceived behavioral control from the theory of planned behavior (Ajzen, 1985, 1991, 2001). The CFC × Time Frame interaction produced significant effects on attitude and perceived behavioral control, but not on subjective norm. Thus, giving consideration to either immediate or long-term positive outcomes of screening not only led participants to view participation as more important, worthwhile, desirable, and so on but also enhanced people’s confidence that they could take part in screening. This interesting finding deserves further consideration. Perceived behavioral control is similar to Bandura’s (1982, 1986, 1997) concept of self-efficacy and has been observed as an outcome in other types of framing studies (e.g., Meyerowitz & Chaiken, 1987). One possible explanation is that when the manipulation was matched to an individual’s typical decision-making style, as determined by CFC, this induced him or her to reflect on the successful completion of typical behavioral goals. It is explicable that the manipulations should not have altered subjective norm because subjective norm refers specifically to the perception that “important others think I should perform the behavior.” There is no necessary reason why temporal frames should have altered perceptions of others’ beliefs. We also obtained evidence that the effects of the interaction of CFC with temporal frame on attitude and perceived behavioral control mediated the effect on behavioral intentions, providing evidence of the internal validity of the model. It would be worthwhile for further research to examine the impact of temporal frames and CFC on variables specified by other theoretical accounts of health-related behavior (Orbell, in press). For example, it would be interesting to know if the manipulations might affect threat appraisal variables, such as perceived susceptibility or fear from protection–motivation theory (Rogers, 1975).

The effectiveness of temporal framing among low CFC participants might also have valuable implications for research concerning other types of health communication. Framing effects derived from prospect theory (Tversky & Kahneman, 1981) typically assume that when faced with a decision regarding participating in a screening behavior, people will normally act to avoid short-term risks of detection (e.g., Meyerowitz & Chaiken, 1987; Rothman et al., 1993; Schneider et al., 2001). The present findings suggest that this may not always be the case because high CFC participants had a generalized tendency to view screening as beneficial in this study. Indeed it has been proposed that the effectiveness of loss-versus gain-framed messages might depend on the extent to which a given individual views a behavior as concerned with risk or prevention (Rothman & Salovey, 1997). The present findings suggest that CFC might be an important variable capable of moderating the relative effectiveness of loss- versus gain-framed messages. It may be, for example, that low CFC individuals are most persuaded by loss-framed messages because they have a greater tendency to consider the immediate risks of detection and

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Without interaction term</th>
<th>With interaction term</th>
<th>With mediator</th>
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<td>Subjective norm</td>
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<td>.69**</td>
<td>.77**</td>
</tr>
</tbody>
</table>

Note. All data above the double line are betas; data below are as indicated. Blank cells indicate data are not applicable. PBC = perceived behavior control; CFC = Consideration of Future Consequences Scale.

a CFC was coded 0 = low, 1 = high. b Order was coded 0 = long-term first, 1 = short-term first. c Time frame was coded 0 = short-term positive, long-term negative, 1 = long-term positive, short-term negative. d This significant beta was most likely due to a suppressor effect. e This significant beta was most likely due to a suppressor effect.

df = 5, 214. i df = 1, 215. 2 df = 4, 215. 2 df = 5, 214. 2 df = 1, 215. 2 df = 1, 215.
to disregard the long-term benefits. The development of tailored messages (e.g., Kreuter et al., 1999) may also benefit from consideration of individual differences in CFC. Tailored messages developed on the basis of individual responses to questionnaire measures of attitude, perceived costs and benefits, self-efficacy, and so on have been shown to be more effective in changing intentions and behavior and to be more systematically processed than nontailored messages. The inclusion of CFC might facilitate tailoring to emphasize immediate or long-term consequences of behavior and behavior change.

A further important finding obtained here concerns our observation that CFC may decline with age. This finding is not contradictory to the assertion that the CFC measures relatively stable individual differences. In fact, the relative ranking of individuals with respect to a given personality dimension may remain stable, even when the average score changes over time (e.g., Santor, Bagby, & Joffe, 1997). For example, individual differences that locate individuals with respect to each other within an age cohort may remain stable over time, whereas the entire cohort might shift position along this individual differences continuum as it ages. Therefore, individual differences may possess stability and be capable of change. If the present observation is confirmed by other studies, this implies that health providers and health educators may need to target health communications to older populations in a manner that recognizes their lower CFC. Because low CFC is generally associated with a less positive attitude toward prevention, the present finding that manipulating the temporal frame in which costs and benefits occur can induce low CFC individuals to view screening as beneficial may be particularly useful in the context of health care for older people. It would also be instructive to examine the relationship of CFC to other sociodemographic variables such as social deprivation, income, and ethnicity. There is evidence, for example, that present time orientation may be higher among African Americans compared with White Americans (e.g., Brown & Segal, 1996). Further research might investigate the possibility that differences in CFC might account for sociodemographic differences in responses to health education materials.

It would be desirable to demonstrate the effects of CFC and temporal frame on actual behavior. This could not be done in the present study because screening for colorectal cancer is not yet available in the United Kingdom. Intentions have been shown to be good predictors of a range of health behaviors, obtaining an average \( r = .53 \) with behavior in a recent meta-analysis of meta-analyses (Sheeran, 2002), and have been shown to specifically provide good prediction of participation in other types of screening (e.g., Orbell & Sheeran, 1998; Rutter, 2000; Sheeran & Orbell, 2000). The present findings may usefully inform future research seeking to motivate participation in colorectal cancer screening.

Although the findings obtained here relate to an individual differences measure of CFC, an alternative theoretical perspective capable of explaining the present findings might be derived from discounted utility theory (Fishburn & Rubinstein, 1982; Meyer, 1993). According to this perspective, decisions are modeled as if people possess individual discount rates that they apply to offset a delay in the receipt of a benefit. In monetary terms, people almost universally possess positive discount rates, reflecting a preference to receive a financial reward sooner rather than later. This is explicable given that money is easily invested and inflation is rarely negative. If applied to health, a positive discount rate implies a preference for experiencing states of good health in the near future rather than in the far future and to defer periods of ill health. A positive discount rate is consistent with a low CFC and a cognitive mind-set in which immediate outcomes are valued above future outcomes. Several studies have shown, however, that some people possess a negative discount rate for health; that is, a preference to experience good health in the far future and to experience ill health sooner rather than later (e.g., Cairns, 1992; Chapman, 1996; Redelmeier & Heller, 1993). Such preferences seem consistent with a high CFC, in which the temporal frame with long-term benefits and short-term costs was dominant in the present study. Thus, there would appear to be convergent implications of individual differences in both CFC and personal discount rates for health.

In summary, stable individual differences in an individual’s tendency to consider the immediate or long-term consequences of his or her behaviors have been demonstrated to have important psychological consequences in the health domain. CFC moderated the processing of information presented in different temporal frames and had substantive implications for the development of positive attitudes, perceived behavioral control, and intentions to participate in a proposed new screening program. The findings underline the value of matching communication content to personal characteristics.

References


