



Didactic and narrative persuasion: An experiment to promote colorectal cancer screening

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Abstract

We tested whether a didactic and a narrative video (i.e. educational content and personal stories versus irrelevant information) could boost colorectal cancer (CRC) screening intention directly and through cognitive predictors of CRC screening behavior. We also tested whether exposure to a story changed participants' affective forecasting, reducing the perception of negative emotions associated with CRC screening (disgust, embarrassment, and fear). The study was conducted online with a between-participants design and recruiting a convenience sample ($N = 375$). We found that, compared with watching the control video, being exposed to the narrative video about CRC screening was indirectly associated with greater screening intention via vicarious experience and positive attitudes, whereas watching the didactic video was positively associated with CRC screening intention only among participants who had received an invitation letter but did not get screened, and among those yet to receive an invitation to screen. In the latter group, screening

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intention was boosted through positive attitudes. Our findings do not confirm that stories change affective forecasting, but narration likely fosters messages acceptance through vicarious experience. We also found support for the effectiveness of physicians' recommendations in promoting CRC screening, an intervention that might be effectively administered through a generalized, cost-effective video.

KEYWORDS

colorectal cancer screening, didactic persuasion, emotions, health promotion, narrative persuasion, theory of planned behavior

INTRODUCTION

Colorectal cancer (CRC) is the third most diagnosed form of cancer and the second deadliest malignancy worldwide (Sung et al., 2021). Although CRC could be prevented with screening examinations (i.e. stool-based tests in most European countries and colonoscopy as a follow-up, or as the first option in some countries like the United States; Navarro et al., 2017), European attendance rates rarely reach the recommended target uptake (i.e. over 65%; Navarro et al., 2017). Given the importance of early detection, research is needed to understand which interventions and communications strategies might foster the uptake of CRC screening exams. The main aim of this study was to test whether two promotional messages (a didactic video and a narrative video) could boost participants' intention to get screened. In addition, the second aim was to test a possible explanation of the effects of narrative persuasion.

To design a theory-driven intervention and research, we relied on the theory of planned behavior (TPB; Ajzen, 1985) integrated with the emotional barriers to CRC screening (Reynolds et al., 2018). Previous studies supported the predictive validity of the TPB in explaining CRC screening intention and behavior (see Cooke & French, 2008). Thus, following this theoretical framework, we considered CRC screening intention as a proxy of attendance behavior. Furthermore, we considered positive attitudes toward CRC screening (i.e. positive evaluations of CRC screening), subjective norms (i.e. perceived social pressure to get screened), and perceived behavioral control (PBC, i.e. perceived ease or difficulty in attending CRC screening) as cognitive determinants of CRC screening intention. However, in the context of CRC screening, it is essential to consider affective variables because negative emotions hinder CRC screening attendance (Reynolds et al., 2018). Indeed, a prior study found that the predictors of behavior suggested by the TPB (i.e. positive attitudes, subjective norms, and PBC), together with the emotional barriers to CRC screening (i.e. disgust, embarrassment, and fear), explained 44 per cent of the variance in CRC screening intention (Scaglioni et al., 2022). Following this study and that of Reynolds et al. (2018), we considered disgust, embarrassment, and fear as prominent factors that hinder CRC screening intention.

Systematic reviews and a meta-analysis investigating the relationship between disgust and CRC screening attendance have confirmed that this emotional barrier was significantly

and negatively associated with CRC screening intention and actual behavior (Reynolds et al., 2013; Scaglioni et al., 2023). In CRC screening, stool manipulation can also elicit embarrassment because it violates social norms and is a cultural taboo (Palmer et al., 2014). Finally, fear can be related to a potential ominous diagnosis, with some patients avoiding screening because they prefer not to know if they are ill (Palmer et al., 2014).

The promotion of CRC screening

Health campaigns promoting CRC screening traditionally adopt didactic persuasion to educate the audience about cancer risks and screening efficacy, enabling a patient's informed choice (e.g. Smith et al., 2015). With the expression "didactic persuasion," we mean health education material delivered to change receivers' attitudes, intentions, or behaviors (Arnold et al., 2022; Occa & Suggs, 2016). Didactic persuasion presents rational arguments favoring a recommended behavior (Occa & Suggs, 2016), typically using statistical information or a "Frequently Asked Questions" format (Wise et al., 2008). Thus, it is perceived as the communication of objective facts (Occa & Suggs, 2016).

Alternatively, health campaigns might use narrative persuasion, which attempts to convince receivers to adopt a particular health behavior through a coherent story that describes a setting, an episode, the point of view of one or more protagonists, their purposes, intentions, actions, and the consequences of the depicted events (Zebregs et al., 2015). Stories are a form of natural communication, familiar and easily understood by human beings (Green, 2006). Many studies of narrative persuasion have empirically confirmed that stories attract the audience's attention, are memorable, and represent a useful persuasive instrument (see Hamby et al., 2018). According to the transportation theory (Green, 2006), the transportation into a narrative world can catalyze a perspective change from the self into the story's characters (Hamby et al., 2018), leading the audience to live a vicarious experience that can positively affect one's cognitions and emotions (Green, 2006). Thus, narrative persuasion can be a particularly effective alternative to didactic persuasion for communicating cancer-related information.

From a theoretical perspective, a positive impact of narratives on CRC screening intention could be due to the reduction of counter-argumentation, facilitation of imaginative processes, and presentation of role models (Green, 2006). However, these hypotheses have remained largely theoretical, with few empirical tests determining their validity (Woudstra & Suurmond, 2019). One example is a recent study by Huang and Green (2022), who investigated whether persuasive narration could reduce the hesitancy toward having a COVID-19 vaccine by eliciting empathy for a fictional character. In the narrative condition, a vaccine-hesitant character spoke about changing their mind about vaccines. However, in this study, the story failed to be more persuasive than the didactic message (but it was more persuasive than the control message), and affective empathy (i.e. experiencing the same emotions as the character) mediated the effect of the narrative message on vaccination intention. In contrast, cognitive empathy (i.e. seeing things from the character's point of view) did not.

Both didactic and narrative persuasion have shown some benefits in the context of screening communication (e.g. Larkey et al., 2009; Quintiliani & Carbone, 2005). For instance, these benefits concerned the promotion of positive attitudes toward CRC screening (e.g. Braddock & Dillard, 2016; Maheri et al., 2021), subjective norms (e.g. Frerichs et al., 2020; Stoffel et al., 2019), and interest toward CRC screening or CRC screening intention (e.g. A. J. Dillard et al., 2010; Maheri et al., 2021; McGregor et al., 2015). Nevertheless, a study comparing didactic and narrative

persuasion in the communication of breast cancer screening found that a narrative message was the most effective in fostering positive attitudes toward screening and screening intention, but the didactic message was the most effective in increasing participants' awareness and knowledge about cancer and cancer screening (Occa & Suggs, 2016). Thus, narratives might have a larger impact on behaviors than didactic material, but didactic material might be the most effective in fostering an informed choice. Indeed, didactic material is more effective than narrative persuasion in improving cognitive beliefs about health behaviors, because the quality of the arguments inside the messages benefits more from statistical than anecdotal information (see Zebregs et al., 2015).

On the other hand, narratives might be particularly effective in boosting PBC, because witnessing a peer's success increases the sense of the self-capability to perform the same task (Bandura, 1998). Furthermore, the main advantage of narrative persuasion over didactic persuasion may be related to emotions. Indeed, didactic-based communication strategies have been criticized for privileging experts' knowledge over emotional arguments (Wise et al., 2008). In contrast, the vicarious experience provided by the exposure to a narrative might act on affective forecasting (A. J. Dillard et al., 2010) and reduce the perception of negative emotions associated with CRC screening (i.e. disgust, embarrassment, and fear; Reynolds et al., 2018). According to the affective forecasting theory (Wilson & Gilbert, 2005), people can correctly predict which emotion they will experience in a given situation. However, the intensity and duration of this emotion are generally overestimated: Anticipated emotions are perceived with greater intensity than felt emotions (e.g. a person feels more disgust when imagining stool sample collection than when actually doing it). According to A. J. Dillard et al. (2010), the vicarious experience provided by the exposure to a narrative might have the same valence as an authentic experience, thus making anticipated emotions closer to those actually perceived. To date, however, we do not have empirical evidence supporting this interpretation.

In this study, we tested both the effects of didactic and narrative persuasion on CRC screening intention (vs. a control video). Furthermore, as previous studies confirmed the critical role of emotional barriers associated with CRC screening (Reynolds et al., 2018; Scaglioni & Cavazza, 2022), we explored whether the narrative intervention, through a vicarious experience, could reduce emotional barriers to CRC screening and ultimately boost CRC screening intention. Finally, to test the interpretation by A. J. Dillard et al. (2010) of the effects of narratives on behavioral change, we explored whether vicarious experience can have a similar impact as direct experience on reducing the barriers associated with the screening exam. In addition, because the participants with no prior screening experience should perceive greater emotional barriers than participants who have already attended CRC screening, narratives should be more effective for them (through the reduction of barriers) than for participants with prior experience. Another reason why we can expect the narrative video, and also the didactic video, to be effective only for those who have never experienced the screening before is that people who have attended CRC screening in the past may be already motivated to screen (Gordon & Green, 2015). Thus, they might express a high CRC screening intention regardless of any persuasive attempt.

The present study

The present study used a between-participants design with three conditions. In the first condition, participants watched a narrative video showing a man and a woman speaking about their CRC screening decision-making process and experience. In the second condition, participants watched a didactic video depicting two doctors describing how CRC screening works and why

getting screened is important. Finally, there was a control condition, in which participants watched a first-person narrative video showing characters talking about a sports medical examination. We preferred videos to texts because, when communicating cancer information, the audio-visual format has more positive effects than infographics on awareness, knowledge, attitudes, and intention (Occa & Suggs, 2016).

Hypotheses

Hypothesis 1. We expected a direct positive effect of watching the narrative or the didactic video on CRC screening intention, so that participants exposed to the narrative and didactic videos would express a greater intention to get screened than participants in the control condition.

Hypothesis 2. Vicarious experience provoked by the narrative video should be associated with decreased disgust, embarrassment, and fear (as a result of the changes in affective forecasting) and should increase positive attitudes toward CRC screening, subjective norms, and PBC (as a result of the fostered acceptance of the message).

Hypothesis 3. We expected a serial mediation, in which the narrative video positively affected the CRC screening intention through vicarious experience and the six parallel mediators described in Hypothesis 2 (i.e. disgust, embarrassment, fear, positive attitudes toward CRC screening, subjective norms, and PBC).

Hypothesis 4. Past CRC screening experience should moderate the association between the didactic and narrative conditions and the outcome.

Hypothesis 5. Past CRC screening experience should moderate the association between the experimental condition and disgust, embarrassment, and fear (in particular, because of affective forecasting, the narrative video should be more effective for those participants with no screening experience than for those with prior experience).

Figure 1 depicts the two investigated models: the serial mediation model with vicarious experience (Figure 1a) and the mediated moderation model with actual experience (Figure 1b). The first model (Figure 1a) represents Hypotheses 2 and 3; the second model (Figure 1b) represents Hypotheses 4 and 5. Both models tested Hypothesis 1.

METHODS

Participants

We used the online platform Prolific to recruit participants ranging from 40 to 74 years old and fluent in Italian. We included participants under the recommended screening age (i.e. typically 45 or 50 years old) to compare the effects of the videos on adults with different screening

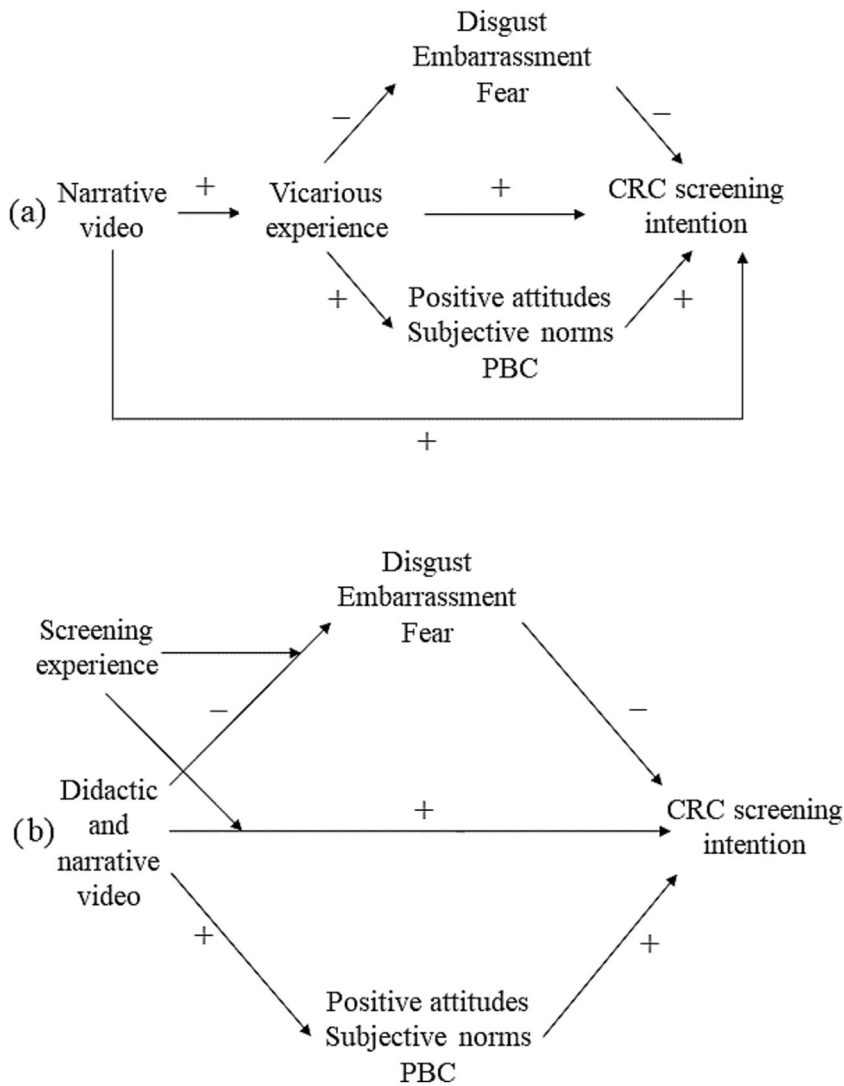


FIGURE 1 The models tested to predict CRC screening intention.

experience (i.e. adults who are approaching the age to get screened, adults who were invited to get screened but did not attend the exam, and adults who attended the CRC screening exam). We remunerated every participation with around £1.30.

To estimate the minimum sample size, we conducted an a priori power analysis (Faul et al., 2007). For $\alpha = .05$, test power = .80 (i.e. the minimum recommended for social sciences; Cohen, 1988), and mean effect of $f = .161$ (based on the effect of first-person narratives on the perception of emotional barriers in A. J. Dillard et al., 2010, for which Cohen's $d = .321$), and based on three groups, the sample required was at least 375 people.

From June 10 to October 29, 2022, 424 people accessed our survey. Three participants denied their consent to participate, and 27 dropped out before completing the study. Three participants were excluded because they failed the attention checks, and another 16 failed the manipulation check. The final sample included 375 participants ($M_{\text{age}} = 48.59$, $SD_{\text{age}} = 7.44$;

59% women; 70% Italian). There were no significant differences in participants' characteristics between the three conditions (Table 1).

Design and procedure

The study was approved by the University of Parma (Protocol number 0282939). The experiment was conducted online: Participants could get access to the study link from Prolific, which is set up so that each participant can have only one submission per study. Participation was anonymous. The survey platform (i.e. Qualtrics) randomly assigned each participant to one of the three conditions, such that they all completed the same questionnaire but saw a different, condition-specific video. The study (i.e. the questionnaire and the three videos) was in Italian. Participants were blind to our hypotheses and the assigned experimental condition. The questionnaire started with a general description of the experiment, and participants were asked to provide informed consent to participation and data treatment. Next, we briefly explained what CRC screening is and measured past attendance (two questions were used to distinguish between participants who had never been invited to screening, participants who attended CRC screening, and participants who had been invited but did not get screened). Then, participants watched one of the three videos, completed the items tapping vicarious experience, and answered questions that did not serve for analyses but were added to foster the deictic return (i.e. the creation of meaning from the video and linking this meaning to own experience;

TABLE 1 Characteristics of participants in each condition and between-group differences.

	Control video		Narrative video		Didactic video		Between-group differences
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Gender							$\chi^2(4) = 3.73, p = .497$
Female	71	59%	69	55%	80	62%	
Male	50	41%	56	45%	48	38%	
Nationality							$\chi^2(10) = 3.65, p = .962$
Italy	87	72%	85	68%	90	70%	
United Kingdom	9	7%	13	10%	10	8%	
Other European country	12	10%	18	14%	17	13%	
North and South America	10	8%	6	5%	7	6%	
Received a CRC diagnosis	3	3%	3	2%	6	5%	$\chi^2(2) = 1.39, p = .499$
With CRC familiarity	23	19%	21	17%	27	21%	$\chi^2(2) = 0.81, p = .666$
CRC screening experience							$\chi^2(4) = 1.21, p = .876$
Non-adherents	11	9%	8	6%	8	6%	
Never-invited	85	70%	93	74%	96	75%	
Adherents	25	21%	25	20%	24	19%	

Note: Participants in the control condition were on average 49 years old ($SD = 7.85$). Participants in the narrative video condition were on average 49 years old ($SD = 7.69$). Participants in the didactic video condition were on average 49 years old ($SD = 6.80$). The difference was not statistically significant, $F(2, 371) = 0.26, p = .770$.

Hamby et al., 2018). Finally, participants completed the items about the negative emotions and the positive cognitive factors associated with CRC screening, CRC screening intention, and sociodemographic data.

The questionnaire included two attention checks, one at the beginning and one at the end of the survey, and two manipulation checks presented immediately after the video (about the video's topic and who the protagonists were). The debriefing explained the purpose of the study and disclosed that the video was played by actors. At the end of the study, participants had the opportunity to watch the two videos they had not seen to guarantee equal treatment.

Materials

The three videos were written and filmed in Italian with experts in health communication and cancer screening from the Local Health Authority of Bologna (Italy). The scripts were created following previous qualitative research (e.g. Beeker et al., 2000) and addressing the topic of affective forecasting (A. J. Dillard et al., 2010). The screening procedures described in the videos are consistent with the typical Italian screening campaigns. A further description of the videos and the integral scripts (translated into English) are reported in Data S1.

Measures

Vicarious experience

Vicarious experience was operationalized using an adaptation of the Transportation Scale—Short Form (Appel et al., 2015). Because this scale was originally designed for reading stories, we adapted the items to the video recording format. The scale includes general questions about the content and specific questions about the characters (A. J. Dillard et al., 2018). As the study aimed to investigate the effect of the vicarious experience during the story, four items concerned participants' transportation into the video content, and another four items concerned identification with each of the narrators (e.g. "I could picture myself in the scene of the events described in the narrative" and "I could put myself in the narrator's shoes"). Participants expressed their agreement with these eight sentences on a 5-point Likert scale, with a higher score indicating greater agreement. Items were presented in a randomized order, and a mean score was calculated. An exploratory factor analysis supported the unidimensionality of the scale tapping vicarious experience, with one large eigenvalue suggestive of a single factor and factor loadings from .658 to .782 (vicarious experience score, $\alpha = .87$).

Cognitive predictors

We adapted items from Scaglioni et al. (2022) to operationalize the cognitive predictors of CRC screening intention. *Positive attitudes* (four items, e.g. "Colorectal cancer screening is useful"; $\alpha = .72$), *subjective norms* (two items, e.g. "People that I consider important in my life would like me to attend colorectal cancer screening"; $r = .56, p < .001$), and *PBC* (three items, e.g. "I think I can successfully use the exam kit"; $\alpha = .73$) were measured. Participants were asked to express their agreement (on 5-point Likert scales) with the sentences about instrumental and

ffective judgments about screening, social pressure to screen, and trust in one's capability to get screened. Items were presented in a randomized order, and a mean score was calculated for each subscale. A higher score in positive attitudes, subjective norms, and PBC corresponded, respectively, to a more positive screening perception, higher perception of social pressure, and higher confidence in the self-capability to get screened.

Negative emotions

Negative emotions were measured through the reduced version of Reynolds et al.'s (2012, 2018) Emotional Barriers to Bowel Screening (EBBS) scale, adapted for the Italian context (Scaglioni & Cavazza, 2022). Thus, we adopted a version of the EBBS scale measuring three emotions associated with CRC screening: fecal disgust, embarrassment, and fear of the outcome. Participants expressed their agreement with sentences about the perception of negative emotions in the CRC screening context on a 5-point Likert scale. Items were presented in a randomized order. Four items measured anticipated CRC screening-related *fecal disgust* (e.g. "The idea of gathering a sample of my own feces makes me feel sick"; $\alpha = .91$), three measured *embarrassment* (e.g. "Imagining that other people know I am collecting stool samples for testing would be embarrassing"; $\alpha = .84$), and three measured *fear of the outcome* (e.g. "I am afraid that giving a stool sample might lead to discovering I have cancer"; $\alpha = .76$). Higher scores indicated greater agreement with the sentences. Mean scores were calculated for each subscale.

CRC screening intention

To assess *CRC screening intention* as a critical dependent variable, we adopted a question asking participants when they would screen, regardless of their age, after being formally invited by a (not specific) local health authority (*within a week, a month, a year, I would keep procrastinating, or never*). This item was adapted from Scaglioni (2023, Chapter 5). The answers were recoded so that higher scores corresponded to a greater willingness to attend CRC screening after being invited.

Data analyses

To test our hypotheses, we ran a serial mediation model and a mediated moderation regression model (respectively, PROCESS Models 8 and 81; Hayes, 2018) with 5000 bootstrap resamples. Experimental conditions and prior CRC screening experience were treated as categorical variables, with the control video and not having received the invitation letter yet as reference categories.

RESULTS

Table 2 reports the means and standard deviations for the study's measures (full sample), as well as the correlations among them. The preliminary analyses indicated that respondents' age, gender, CRC familiarity (i.e. being related to someone who has previously received a CRC

TABLE 2 Mean, standard deviation, and correlations between variables.

	<i>M</i> (<i>SD</i>)	Age	Gender	CRC familiarity	Vicarious experience	Disgust	Embarrassment	Fear	Attitudes	Subjective norms	PBC
Vicarious experience	3.20 (0.86)	.12*	.13*	-.05							
Disgust	2.00 (1.07)	-.06	.00	-.05	.03						
Embarrassment	1.81 (0.96)	-.11*	.01	-.07	.04	.74***					
Fear	2.51 (1.01)	-.03	.03	-.04	.20***	.40***	.40***				
Attitudes	4.03 (0.81)	.14**	.05	.15**	.16***	-.55***	-.53***	-.30***			
Subjective norms	4.14 (1.09)	.20***	-.01	.13**	.32***	-.20***	-.28***	.03	.51***		
PBC	4.29 (0.85)	.11*	.03	.07	.07	-.62***	-.63***	-.31***	.57***	.37***	
Screening intention	4.03 (1.07)	.09	-.05	.05	.21***	-.30***	-.25***	-.16**	.52***	.31***	.31***

* $p \leq .05$.** $p \leq .01$.*** $p \leq .001$.

diagnosis), or history (i.e. having received a diagnosis of CRC) did not correlate with CRC screening intention (see Table 2). Hence, we did not consider these further in the subsequent analyses. We first carried out a series of analyses of variance (ANOVAs) testing the effects of the three videos and past CRC screening experience on screening intention and all the hypothesized mediators. Table 3 reports the means and standard deviations. Experimental condition affected only vicarious experience, embarrassment, and attitudes. Thus, these were the only mediators considered in the final models.

In other words, compared with the expected model (Figure 1a) based on the ANOVA results, the final serial mediation (Figure 2) did not include disgust, fear, subjective norms, and PBC but assessed the effects of the narrative and didactic videos (vs. the control video) on CRC screening intention directly, through vicarious experience and then through two parallel mediators (i.e. attitudes and embarrassment). Similarly, the second model tested the moderating effect of prior CRC screening experience on the association between the videos, only these two mediators (i.e. attitudes and embarrassment), and CRC screening intention (Figure 1b). Contrary to Hypothesis 1, these models issued no main effect of the narrative or the didactic videos on CRC screening intention (Figures 2 and 3).

TABLE 3 Analyses of variance.

Experimental condition				
	Control video <i>M (SD)</i>	Narrative video <i>M (SD)</i>	Didactic video <i>M (SD)</i>	Between-group differences
Vicarious experience	3.03 (0.87) ^a	3.40 (0.84) ^b	3.16 (0.84) ^{ab}	$F(2, 372) = 6.23, p = .002$
Disgust	2.06 (1.03) ^a	2.08 (1.13) ^a	1.87 (1.06) ^a	$F(2, 372) = 1.56, p = .211$
Embarrassment	1.94 (0.98) ^a	1.87 (0.99) ^{ab}	1.64 (0.90) ^b	$F(2, 372) = 3.48, p = .032$
Fear	2.59 (1.00) ^a	2.56 (1.05) ^a	2.38 (0.98) ^a	$F(2, 372) = 1.54, p = .215$
Attitude	3.99 (0.74) ^{ab}	3.91 (0.84) ^a	4.19 (0.82) ^b	$F(2, 372) = 3.94, p = .020$
Subjective norms	4.02 (1.19) ^a	4.13 (1.04) ^a	4.25 (1.05) ^a	$F(2, 372) = 2.32, p = .099$
PBC	4.24 (0.90) ^a	4.22 (0.85) ^a	4.42 (0.80) ^a	$F(2, 372) = 1.38, p = .253$
Screening intention	3.98 (1.04) ^a	3.94 (1.17) ^a	4.17 (0.98) ^a	$F(2, 372) = 1.78, p = .170$
CRC screening experience				
	Non-adherents <i>M (SD)</i>	Never-invited <i>M (SD)</i>	Adherents <i>M (SD)</i>	Between-group differences
Vicarious experience	3.01 (0.89) ^a	3.18 (0.86) ^a	3.34 (0.84) ^a	$F(2, 372) = 1.78, p = .170$
Disgust	2.13 (1.23) ^{ab}	2.07 (1.09) ^a	1.72 (0.88) ^b	$F(2, 372) = 3.35, p = .036$
Embarrassment	1.58 (0.99) ^{ab}	1.89 (1.00) ^a	1.60 (0.75) ^b	$F(2, 372) = 3.50, p = .031$
Fear	2.61 (1.06) ^a	2.55 (1.04) ^a	2.32 (0.89) ^a	$F(2, 372) = 1.74, p = .177$
Attitude	3.78 (0.98) ^a	3.95 (0.78) ^{ab}	4.41 (0.73) ^b	$F(2, 372) = 11.52, p = .000$
Subjective norms	4.20 (1.01) ^{ab}	4.00 (1.13) ^a	4.63 (0.83) ^b	$F(2, 372) = 10.22, p = .000$
PBC	4.33 (0.72) ^{ab}	4.21 (0.88) ^a	4.59 (0.71) ^b	$F(2, 372) = 5.96, p = .003$
Screening intention	2.93 (1.49) ^a	4.04 (1.00) ^b	4.38 (0.86) ^c	$F(2, 372) = 20.28, p = .000$

Note: Values in the same row with different superscript letters are significantly different at $p < .05$.

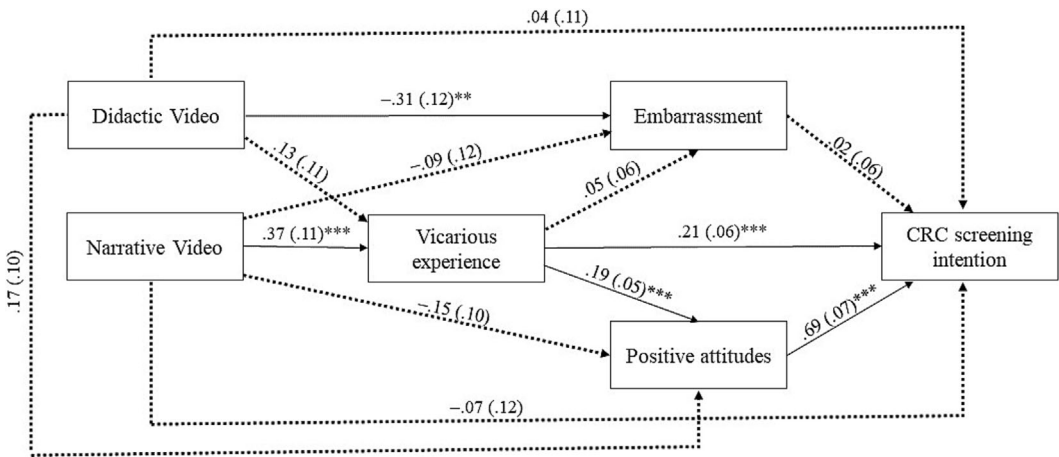


FIGURE 2 Serial mediation model (PROCESS Model 81). $N = 375$.

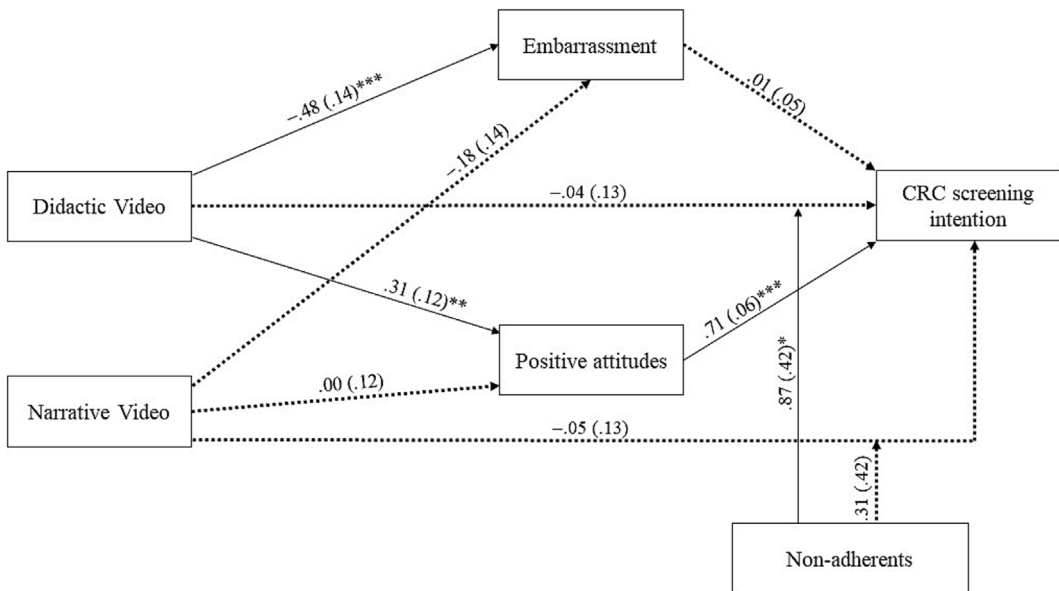


FIGURE 3 Mediated moderation model (PROCESS Model 8). $N = 375$.

With the serial mediation model, we found that only the narrative video (vs. control video) was associated with a greater vicarious experience (Figure 2). Partially in line with Hypothesis 2, vicarious experience was positively associated with attitudes, but it was not associated with embarrassment (Figure 2). We partially confirmed the expected serial mediation (Hypothesis 3): The narrative video had a small positive indirect effect on CRC screening intention through vicarious experience and positive attitudes ($b = .05$, $SE = .02$, 95% CI [0.02, 0.10]). The only significant effect of the didactic video (vs. control video) was on embarrassment (Figure 2).

Partially in line with Hypothesis 4, as concerns the mediated moderation we found that only the didactic video significantly interacted with past CRC screening experience (Figure 3). Those

participants who had previously received an invitation letter, but did not get screened, expressed a greater CRC screening intention when exposed to the didactic video (vs. the control video), $b = .83$, $SE = .40$, $p = .038$. The single slopes analysis is reported in Data S2. For neither video, we found support for Hypothesis 5: Past CRC screening experience did not moderate the effects of the two videos on embarrassment ($p \geq .061$). However, for those participants who had never received an invitation to screen (but not the others), we found a positive indirect effect of the didactic video on CRC screening intention through positive attitudes ($b = .22$, $SE = .08$, 95% CI [0.06, 0.38]).

DISCUSSION

Here, we tested whether a didactic and a narrative video about CRC screening might promote participants' CRC screening intention. In addition, as research on the use of narrative persuasion to promote CRC screening is in its initial stages, and it still needs to unravel how and why stories impact decision-making processes regarding screening (Woudstra & Suurmond, 2019), we empirically tested whether the exposure to a narrative video affected participants' affective forecasting.

Contrary to our first hypothesis, the narrative and the didactic video (vs. control video) did not directly foster CRC screening intention. Only the narrative video was effective in creating a vicarious experience, and partially in line with our expectations, this improved participants' positive attitudes toward CRC screening, ultimately boosting participants' CRC screening intention. Likely, this result is more due to a greater acceptance of the story contents (Braddock & Dillard, 2016) rather than to a change in affective forecasting. Therefore, our findings did not support A. J. Dillard et al.'s (2010) interpretation of the narrative persuasion effects.

Indeed, our preliminary analyses showed that vicarious experience and past CRC screening experience were differently associated with emotions (whereas they should have had a similar valence): Vicarious experience was positively associated with fear, whereas having attended CRC screening (vs. having not yet received the invitation letter) was negatively associated with disgust and embarrassment. That participants who have attended CRC screening reported low disgust and embarrassment toward the procedure is in line with affective forecasting (i.e. recalled emotions are less intense than anticipated emotions), but the positive association between vicarious experience and fear seems to be more coherent with the empathy-related processes theorized by Huang and Green (2022), with participants "absorbing" the fear expressed by the two protagonists, rather than with affective forecasting.

In addition, our main findings suggested that the positive effects of narratives and vicarious experience are mediated only by positive attitudes and not by a reduced perception of barriers associated with CRC screening: Narratives and vicarious experience apparently had no impact on the affective forecasting of embarrassment, and embarrassment had no impact on CRC screening intention. Similarly, the effects of the narratives on CRC screening barriers (i.e. embarrassment) or intention did not vary as a function of past CRC screening experience.

Only for the didactic video we found the expected interaction between experimental condition and past CRC screening behavior. The video depicting two doctors speaking about screening—the didactic video—boosted CRC screening intention among participants who had previously received an invitation letter but did not attend the test, and indirectly did so through positive attitudes among those participants who had not yet received the invitation letter. For the former participants, exposure to a compelling message from a trustworthy source (i.e. the

two doctors) might have enhanced the cognitive dissonance deriving from having refused to attend CRC screening and the evidence of its utility (Ent & Gerend, 2016). Because people are motivated to settle the conflict between their beliefs (e.g. about the screening efficacy) and their behavior (i.e. refusing to screen), formulating an intention to get screened is a way of restoring consistency and alleviating cognitive dissonance.

Cognitive dissonance might also explain why the didactic video benefited those participants who had not yet been targeted for screening. When individuals are still too young to be invited for a medical examination, they do not need to form negative attitudes toward that exam to justify their refusal to engage (Ent & Gerend, 2016). Indeed, they are more prone to form positive attitudes toward it, even when portrayed as invasive and unpleasant (Ent & Gerend, 2016).

Finally, the didactic video may have met participants' needs for factual information (Quintiliani & Carbone, 2005) and effectively simulated a conversation with two physicians recommending screening, which is one of the most robust interventions to promote CRC screening (see Sarma et al., 2019).

Some limitations of the present study should be noted. The key drawbacks were not assessing the effects of the videos on behavior and relying only on self-reported measures. However, using intention measures allowed us to protect participants' privacy and include people approaching the recommended age to screen (i.e. who were not yet allowed to participate in the organized screening program). In addition, although intention is an imperfect proxy of behavior, the two constructs are robustly associated (Cooke & French, 2008). Furthermore, self-reports are good indicators of feeling states because they effectively capture subjective experiences (J. P. Dillard et al., 2017).

Nevertheless, we acknowledge that a quantitative cross-sectional design might be too constrained to investigate the complex mechanisms of persuasion and its effects on emotional barriers. Therefore, further studies should use a mixed-method longitudinal approach, quantitatively and qualitatively exploring the thoughts and feelings aroused by the videos and assessing cause-effect relationships that could not be established in the present work.

We recognize that recruiting a convenience sample limited the external and ecological validity of the present findings. In addition, our sample included only a few people who did not attend the screening exam after receiving the invitation letter (e.g. only eight participants exposed to the didactic video and 11 participants to the control video). Therefore, the results of the moderation analysis should be treated with caution. Further studies should strive to recruit representative samples of the population, with particular attention to citizens with low socio-economic status. Indeed, it would be interesting to explore whether citizens with low income or education benefit more from narrative persuasion (e.g. Kreuter et al., 2010) or from informative materials where doctors endorse CRC screening (e.g. Wardle et al., 2016). Similarly, further studies should put more effort into recruiting citizens from minorities and into testing targeted material (e.g. Aspiras et al., 2023; Lucas et al., 2021, 2023).

With the aforementioned limitations in mind, the present findings also have several strengths. Although narrative persuasion is a multifaceted process, most previous studies failed to consider its effects on emotions and subsequent effects on behavioral change (Hamby et al., 2018). Our study analyzes both cognitive and affective outcomes of a narrative and a didactic video in a specific theory-driven framework, the TPB (Ajzen, 1985), enriched with the emotional barriers to CRC screening (Reynolds et al., 2018). This is important because only theory-based research can explain the mechanisms underlying the effects of narrative persuasion on screening behavior (Perrier & Martin Ginis, 2017). Our study provides the first test of the idea that narration impacts affective forecasting, and its findings seem to show otherwise.

Another strength is that the narrative video included several topics that are typically addressed individually (Woudstra & Suurmond, 2019): It had an “experience” component (i.e. what the screening was like), a “process” component (i.e. the description of how the protagonists decided to screen), and an “outcome” component (i.e. the expression of feelings of relief after having attended screening). Another merit of this study is using videos rather than texts, because promoting CRC screening through an audio-visual medium is an effective strategy to reach people with low literacy (Woudstra & Suurmond, 2019), who are the most reluctant to screen (von Wagner et al., 2011).

This study contributes to extending the narrative persuasion research to new linguistic populations. Prior studies were mainly conducted with English-speaking samples; thus, we cannot be sure that the existing findings can be applied and generalized to other linguistic populations (Occa & Suggs, 2016). To the best of our knowledge, only Gavaruzzi et al. (2018) tested the effects of narrative persuasion on the CRC screening intention of Italian-speaking participants, but they used text narratives. Their findings showed that a relief-based narrative (i.e. feeling relieved after receiving a negative result from the fecal occult blood test) was more effective in boosting CRC screening intention than an informative leaflet. However, unlike the didactic video we tested, their informative text did not simulate the chat with a physician. In the present study, the presence of two (fictional) doctors may have been the key to the effectiveness of the didactic video. Indeed, the research on CRC screening promotion suggests that the recommendation by physicians could be a very effective intervention (see Sarma et al., 2019). We suggest that such an intervention can be vicariously administered through a cost-effective video depicting doctors explaining CRC risks and how screening works.

Finally, these preliminary results about the moderating role of past CRC screening experience on the association between didactic persuasion and CRC screening intention (which should be replicated with larger, representative samples and prospective designs) contribute to the practical implications of the present study, suggesting that communication campaigns should strive to reach those citizens who did not attend CRC screening, and should target also citizens who are a few years younger than the local recommended CRC screening age (e.g. citizens over 40 years old).

CONFLICT OF INTEREST STATEMENT

The authors report there are no competing interests to declare.

DATA AVAILABILITY STATEMENT

The experimental materials and datasets are available at https://osf.io/3952s/?view_only=49e5692bf3654b0bba0b4bddf9657e25.

ETHICS STATEMENT

We declare to comply with the *Ethical Principles of Psychologists and Code of Conduct* of the American Psychological Association. The present study was approved by the University of Parma Research Ethics Board (Protocol number 0282939).

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