

## Preference for deliberation and perceived usefulness of standard- and narrative-style leaflet designs: Implications for equitable cancer-screening communication

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## **Abstract**

**Background:** In the United Kingdom, cancer screening invitations are mailed with information styled in a standard, didactic way to allow for informed choice. Information processing theory suggests this ‘standard-style’ could be more appealing to people who prefer deliberative thinking. People less likely to engage in deliberative thinking may be disenfranchised by the design of current standard-style information.

**Purpose:** To examine the distribution of preference for deliberative thinking across demographic groups (Study 1), and explore associations between preference for deliberative thinking and perceived usefulness of standard- and narrative-style screening information (Study 2).

**Methods:** Study 1, adults aged 45-59 ( $n = 4,241$ ) were mailed a questionnaire via primary care assessing preference for deliberative thinking and demographic characteristics. Study 2, a separate cohort of adults aged 45-59 ( $n = 2,058$ ) were mailed standard- and narrative-style leaflets, and a questionnaire assessing demographic characteristics, preference for deliberative thinking and perceived leaflet usefulness. Data were analysed using multiple regression.

**Results:** In Studies 1 ( $n=1,783$ ) and 2 ( $n=650$ ), having lower socioeconomic status, being a women and of non-white ethnicity was associated with lower preference for deliberative thinking.

In Study 2, the standard-style leaflet was perceived as less useful among participants with lower preference for deliberative thinking, while perceived usefulness of the narrative-style leaflet did not differ by preference for deliberative thinking.

**Conclusions:** Information leaflets using a standard-style may disadvantage women and those experiencing greater socio-economic deprivation. More work is required to identify design styles that have a greater appeal for people with low preference for deliberative thinking.

**Keywords:** colorectal cancer, cancer screening, decision making, human information processing, dual-process theory

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Colorectal cancer is the second most common cause of cancer deaths in men and women in many developed countries (1-3). Screening reduces colorectal cancer mortality by detecting cancers at an earlier, more treatable, stage or by preventing precancerous adenomas developing into the disease (4,5). In 2006, the English National Health Service Cancer Screening Programme began recommending guaiac faecal occult blood testing as a colorectal screening test option and it is now offered biennially to people aged 60 to 74 (6). Uptake of colorectal screening for first time invitees was 49% in the United Kingdom in 2015 (7). There continues to be disparities in uptake, with men, people in ethnic minorities and people from more socioeconomically deprived neighbourhoods being less likely to complete a guaiac faecal occult blood test (7).

Current policy in the United Kingdom is that people should make an informed choice about participating in cancer screening (8). People invited to participate in cancer screening are mailed an information leaflet to assist them in making an informed choice. The leaflet is the primary source of information for most invitees, making it important that such information is accessible to all invited. Invitees to the English colorectal cancer screening program are sent 'Bowel Cancer Screening: The Facts', a 16 page A5 leaflet that describes colorectal cancer, the colorectal cancer screening procedure and the risks and benefits involved in colorectal cancer screening (9). The leaflet contains heading titles, 'facts' in the form of bullet pointed sentences and a diagram of the human body. The information in this leaflet requires the reader to make connections between concepts, sift through information to identify what is relevant to their personal values and situation and, weigh up different decision dimensions. These activities require processing information slowly and consciously

(10). This mode of thinking will be referred to as deliberative thinking from this point forward. Additionally, the only motive provided by the leaflet for reading it is that the reader can find out about screening and make a decision about screening, an activity that will mostly appeal to people who enjoy thinking deliberatively. Therefore, if a person is less likely to engage with or enjoy deliberative thinking they may be less likely to engage with a health leaflet of a standard style. Additionally, research suggests a person's thinking style remains relatively consistent over time (11,12). Therefore, people with a low preference for deliberative thinking will consistently be disadvantaged when presented with health information in this style (13), and this may contribute to unequal access to information about cancer screening.

Providing people invited to screening with leaflets of a 'narrative' design – events expressed in the form of a story – may help in overcoming these communication inequalities. Patient experiences or narratives in the form of first-person stories are increasingly being used in medical information communication (14). Narratives present information through more vivid and easy to imagine scenarios that facilitate engagement with, and retrieval of, the information (15). Importantly, narratives possess intrinsic appeal to be read and therefore do not require the reader to be motivated by wanting to engage in deliberation (16). Patient narratives, therefore, may offer an alternative presentation format that does not disadvantage people with low preference for deliberative thinking.

To better understand the effect that providing standard style health communication has across different demographic populations, it will be necessary to identify any pattern in deliberative thinking across the populations. The Need for Cognition scale, originally developed by Cacioppo and Petty, measures engagement, enjoyment and confidence in deliberation (11) – providing a well-established tool for measuring preference for deliberative

thinking (11). Need for Cognition has had considerable research attention and Coelho, Hanel and Wolf have reported many studies showing the Need for Cognition scale to have high internal consistency (17). Unfortunately, many of these studies do not report the associations between participant demographics and Need for Cognition (for example, 18). Of the studies that have reported this association, some have found older age to be associated with lower Need for Cognition (19), while others have found no difference in Need for Cognition across age (20). Some studies have found men to have higher Need for Cognition (21). Other studies have found higher levels of education to be associated with higher Need for Cognition (22,23). To investigate the potential negative impact of certain design choices on equitable communication of cancer screening information, it will first be necessary to investigate the potential demographic differences in preference for deliberative thinking in our study population.

The aim was to first examine associations between demographic factors (age, socioeconomic status, gender, ethnicity) and deliberative thinking, in a community-based sample (Study 1 & 2), and then determine whether preference for deliberative thinking influences perceived usefulness of cancer screening information of either a standard- or narrative-style (Study 2).

### **Study 1**

Study 1 was a postal questionnaire study examining associations between individual characteristics (age, socioeconomic status, gender, ethnicity) and preference for deliberative thinking.

### **Method**

**Sample and procedure.** Eligible participants ( $n = 4,583$ ) were patients aged 45-59 years, registered with one of four general practices in South-East England. General

practitioners were asked to exclude patients with a recent diagnosis of cancer, or who were considered 'vulnerable' (e.g. learning disabled, cognitively impaired), which resulted in the exclusion of 342 (8%) people. The remaining 4,241 participants were mailed a study invitation letter from their general practitioner, along with the study questionnaire and a Freepost reply envelope. Reminder questionnaires were sent to non-respondents after two weeks. All questionnaires were mailed between June and December 2009. Ethical approval was granted by the National Research Ethics Service London Bridge Committee.

### **Measures.**

***Preference for deliberative thinking.*** Preference for deliberative thinking was measured using 12 items from a modified version of the Need for Cognition scale produced by Epstein and colleagues (24). The items in this modified Need for Cognition scale fall into two subscales identified by Epstein et al through factor loading analyses. The first subscale measures ability to think deliberatively and the second measures likelihood to engage in deliberative thinking. The 12 items used in the current study included six of the ability questions ('I am much better at figuring things out logically than most people'; 'I have a logical mind'; 'Using logic usually works well for me in figuring out problems in my life'; 'I'm not very good at solving problems that require careful logical analysis' [reverse scored]; 'I am not a very analytical thinker' [reverse scored]; 'Reasoning things out carefully is not one of my strong points' [reverse scored]) and six of the engagement questions ('I enjoy intellectual challenges'; 'I enjoy solving problems that require hard thinking'; 'I prefer complex problems to simple problems'; 'I try to avoid situations that require thinking in depth about something; [reverse scored]; 'I don't like to have to do a lot of thinking' [reverse scored], 'Knowing the answer without having to understand the reasoning behind it is good enough for me' [reverse scored]). Response options were on a five-point scale: 'Definitely

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false (scoring 1); Mostly false; Undecided/equally true and false; Mostly true; Definitely true (scoring 5)'. The Cronbach's alpha score for this scale was 0.85.

Scores for ability and engagement in deliberative thinking were highly correlated ( $r(1569) = 0.63, p < .001$ ), supporting their grouping into a single measure of preference for deliberative thinking.

***Demographics characteristics.*** Age and gender were obtained from the general practices. The questionnaire collected information on car ownership, home ownership and level of formal education. This information was combined to create a composite score for socio-economic deprivation from zero to three, with three being equivalent to renting accommodation, not owning a car and having no formal education. A composite score of socio economic position with these three indices of deprivation has been used in previous research (25).

The questionnaire asked for participants ethnicity, responses to which were recoded into 'did not identify white' and 'identified as white' during analysis because many participants identified as white while there were only a small number of participants in each of the other ethnic subgroups (10 subgroups, all  $n < 85$ ). The questionnaire also contained items on age and gender to identify whether the intended recipient had completed the questionnaire.

## **Data analysis**

Data were analysed using IBM SPSS Statistics version 22.0. Pearson correlation tests were used to assess associations between deliberative thinking and age and socioeconomic status. T tests were used to assess differences in preference for deliberative thinking by gender and ethnicity. A multiple linear regression was performed to determine the strength



of association between age, gender, ethnicity and socioeconomic status, and preference for deliberative thinking.

## Results

**Sample.** Of the 4,241 questionnaires mailed out, 185 (4%) were returned undelivered. Completed questionnaires were returned from 1,783 respondents, giving a response rate of 44% (1783/4056). Based on the general practice data, more women (49%) than men (40%) returned the survey ( $\chi^2(1, 4056) = 32.4, p < .001$ ). Respondents were also slightly older (51.3 years vs. 50.9 years;  $t(4054) = 3.02, p = .003$ ), and came from more affluent neighbourhoods (IMD rank = 21517 vs. 20497;  $t(4052) = 3.13, p = .002$ ), compared to non-respondents. Of the respondents, 194 were excluded from analysis because their self-stated age or gender did not match the general practice data, resulting in a final sample of 629 for analysis.

### **Demographic factors and deliberative thinking.**

**Age.** There was no significant association between age deliberative thinking ( $r(1569) = -0.03, p = .309$ ).

**Socioeconomic status.** Socioeconomic deprivation was significantly negatively correlated with deliberation ( $r(1393) = -0.11, p < .001$ ). As socioeconomic deprivation increased, preference for deliberation decreased.

**Gender.** Gender differences were significant ( $t(1567) = 10.29, p < .001$ ). Men were more likely to prefer deliberative thinking ( $M = 45.31, sd = 7.03$ ) than women ( $M = 41.73, sd = 6.73$ ).

**Ethnicity.** There was a significant difference in preference for deliberation by ethnicity ( $t(1558) = -3.31, p = .001$ ). Those who identified as white reported a higher

preference for deliberative thinking ( $M = 43.65$ ,  $sd = 7.10$ ) than those who did not identify as white ( $M = 42.08$ ,  $sd = 6.89$ )

**Regression model.** A multiple linear regression model predicting preference for deliberative thinking based on age, socioeconomic status, gender and ethnicity was found to be significant ( $F(4, 1384) = 28.00$ ,  $p < .001$ ), with an  $R^2$  of .075 (Table 1). Age ( $B = -0.02$ ,  $p = .627$ ) remained non-significant while socioeconomic status ( $B = -1.56$ ,  $p < .001$ ), gender ( $B = 3.46$ ,  $p < .001$ ) and ethnicity ( $B = -1.10$ ,  $p = .026$ ) remained significant predictors of deliberative thinking.

## Discussion

Study 1 found preference for deliberative thinking to be correlated with socioeconomic status, gender, and ethnicity. Age was not correlated with preference for deliberation. However, the narrow age range of the participants limits interpretation of this result.

## Study 2

Study 2 examined preference for deliberative thinking and perceived usefulness of two cancer screening information designs: i) standard-style and; ii) narrative-style. Due to limited previous research, we made no hypothesis about the direction of association between preference for deliberation and perceived usefulness of the two leaflets.

## Method

**Sample and procedure.** Patients aged 45-59 years who were registered with one of three selected general practices in England (two in London and one in North West England – all different to the practices used in Study 1) were eligible to take part in this study. People in this age range were selected as they would not yet have participated in the colorectal cancer screening programme, but would be approaching the age of screening eligibility,

ensuring that participants had no direct experience of the screening process which could influence their beliefs and responses to the information material. The General practitioners were asked to exclude anyone known to have colorectal health problems or considered too unwell or unsuitable for participation. Eligible participants ( $n = 4,125$ ) were randomly assigned to one of two groups using Random Allocation Software for a separate analysis (26). The present analysis focused exclusively on participants from one arm of this randomisation, the group that were sent both the standard- and narrative-style leaflets, ( $n = 2,058$ ). Data collection took place between June 2012 and January 2013. Ethical approval was granted in February, 2012 by the North East – Northern and Yorkshire National Research Ethics Service Committee.

**Materials.** Participants were mailed a study invitation letter, a standard-style leaflet, a narrative-style leaflet, a questionnaire booklet and a Freepost return envelope. A reminder letter was sent along with another copy of the study materials to non-respondents after approximately four weeks.

**Standard-style leaflet.** Participants were sent a ‘Bowel screening: The Facts’ leaflet: a 16-page booklet presenting factual and statistical information about colorectal cancer, colorectal cancer screening, the National Health Service Bowel Cancer Screening Programme, guaiac faecal occult blood testing, and follow-up colonoscopy predominantly in bullet points (9). The booklet included a summary page and contact details for extra information and support. This leaflet was developed for the National Health Service English Bowel Screening Programme.

**Narrative-style leaflet.** Participants were also sent a ‘Bowel screening: People’s stories’ leaflet: a tri-fold, A4 sized leaflet that presented the reader with a selection of eight quotes and personal stories about different, but positive, bowel screening experiences (27).

These accounts were taken from real people and were presented in the leaflet next to a photo of each volunteer. The stories covered the psychological and physical consequences of deciding to take part in screening. The development of this leaflet was led by researchers at University College London for research purposes (26).

### **Measures.**

***Preference for deliberative thinking.*** Preference for deliberative thinking was measured using six of the 12 items used in Study 1. To reduce participant burden, six items were chosen based on Study 1 data. We considered the Cronbach's alpha if an item was deleted to identify which items gave the highest internal reliability for the scale these included: deliberative thinking ability ('I have a logical mind'; 'I am not very good at solving problems that require careful logical analysis'; 'I am much better at figuring things out logically than most people') and engagement in deliberative thinking ('I enjoy intellectual challenges'; 'I enjoy problems that require hard thinking'; 'I don't like to have to do a lot of thinking'). Cronbach's alpha for this scale was 0.80. Scores for ability and engagement for deliberative thinking were highly correlated ( $r(620) = 0.63, p < .001$ ).

***Perceived usefulness of information.*** Perceived usefulness offers a method of capturing whether the reader accepts and is able to use the information presented in the leaflet. Participants were asked to rate the usefulness of each information leaflet on a seven-point Likert scale, where 7 was 'Useful' and 1 was 'Not at all useful'.

***Demographic characteristics.*** The demographic characteristics were measured and coded as in Study 1.

### **Data analysis.**

All data were analysed using IBM SPSS Statistics version 22.0.

***Demographic factors and deliberative thinking.*** Following the method of analysis used in Study 1, Pearson correlation tests were used to assess the association between preference for deliberative thinking by age and socioeconomic status. T tests were used to assess differences in preference for deliberative thinking by gender and ethnicity. A multiple linear regression was performed to determine the strength of association between age, gender, ethnicity and socioeconomic status, and preference for deliberative thinking in a multivariable model.

***Perceived usefulness and deliberative thinking.*** Pearson correlation tests were used to assess associations between preference for deliberative thinking by perceived usefulness for each leaflet; standard-style and narrative-style. For each leaflet, a multiple linear regression was performed to determine whether deliberative thinking remained significantly associated with perceived usefulness while controlling for socioeconomic status, gender and ethnicity.

## **Results**

**Sample.** Of the 2,058 questionnaires mailed out, 49 (2%) were returned undelivered. Completed questionnaires were returned by 650 people – representing a 32.4% response rate ( $n = 650/2009$ ).

Based on the general practice data, women were more likely to return the questionnaire (35.2%) than men (29.4%;  $\chi^2(1, 2008) = 7.68, p = .006$ ). Respondents were slightly older (age  $M = 51.7, SD = 4.18$ ) than non-respondents (age  $M = 51.0, SD = 4.19$ ;  $t(2006) = 3.58, p < .001$ ). Respondents were also more likely to come from a more affluent neighbourhood than those who did not return the questionnaires (IMD rank = 12156 vs. 9828;  $t(1996) = 6.50, p < .001$ ).

Of the respondents, 21 were excluded from the analysis because their age and/or gender did not match between the general practice data and their self-reported data, resulting in a final sample of 629 for analysis.

**Demographic factors and deliberative thinking.**

**Age.** Replicating Study 1, age was not significantly correlated with preference for deliberative thinking ( $r(619) = -0.04, p = .305$ ).

**Socioeconomic status.** Again, socioeconomic deprivation was significantly negatively correlated with preference for deliberation ( $r(620) = -0.13, p = .002$ ). As socioeconomic deprivation increased, preference for deliberation decreased.

**Gender.** Men were slightly more likely to prefer deliberative thinking ( $M=23.16, sd = 3.74$ ) than women ( $M=22.53, sd = 3.73; t(617)=2.09, p=.037$ ).

**Ethnicity.** Those who identified as white were more likely to prefer deliberative thinking ( $M=23.07, sd = 3.61$ ) compared to those who did not identify as white ( $M=21.09, sd = 3.70; t(616)=4.47, p<.001$ ).

**Regression model.** A multiple linear regression model predicting preference for deliberative thinking including age, socioeconomic status, gender and ethnicity was found to be significant ( $F(4, 616) = 8.08, p < .001$ ), with an  $R^2$  of .050 (Table 1). Age ( $B = -0.04, p = .234$ ) remained non-significant while socioeconomic status ( $B = -0.43, p = .020$ ), gender ( $B = 0.65, p = .030$ ) and ethnicity ( $B = -1.81, p < .001$ ) all remained significant predictors of deliberative thinking.

**Leaflet usefulness and deliberative thinking.**

**Overall usefulness scores.** Overall, both the standard-style leaflet (usefulness score,  $M = 6.37, SD = 1.23$ ) and the narrative-style leaflet (usefulness score,  $M = 5.88, SD = 1.59$ ) were rated as useful, where 7 was the highest available usefulness score. A high proportion

of participants (73.4%) rated both leaflets equally useful, while 23.4% rated the standard-style leaflet as more useful and only 3.2% rated the narrative-based leaflet as more useful.

***Perceived usefulness of standard-style leaflet.*** A significant correlation was found between preference for deliberative thinking and perceived usefulness of the formal-style leaflet ( $r(568) = 0.15, p < .001$ ). A multiple linear regression model predicting perceived usefulness of the formal leaflet based on preference for deliberative thinking that included socioeconomic status, gender and ethnicity as covariates, was found to be significant ( $F(4, 560) = 18.20, p < .001$ ), with an  $R^2$  of .115 (Table 2). Deliberative thinking remained significantly associated ( $B = 0.04, p = .004$ ), alongside, socioeconomic status ( $B = -0.36, p < .001$ ), gender ( $B = -0.28, p = .005$ ) and ethnicity ( $B = -0.42, p = .005$ ).

***Perceived usefulness of narrative-style leaflet.*** No significant association was found between level of preference for deliberative thinking and perceived usefulness of the narrative-based leaflet ( $r(558) = -0.02, p = .564$ ). A multiple linear regression model predicting perceived usefulness of the narrative-style leaflet based on preference for deliberative thinking that included socioeconomic status, gender and ethnicity as covariates was performed. A significant equation was found ( $F(4, 550) = 6.79, p < .001$ ), with an  $R^2$  of .047 (Table 2). Preference for deliberative thinking was not a predictor of perceived usefulness of the narrative-style leaflet ( $B = -0.02, p = .227$ ), while socioeconomic status ( $B = -0.29, p = .001$ ), gender ( $B = -0.34, p = .012$ ) and ethnicity ( $B = -0.44, p = .029$ ) were predictors. This model was less predictive of perceived usefulness ( $R^2 = .047$ ) compared to the model for the standard-style leaflet ( $R^2 = .115$ ).

## **Discussion**

Preference for deliberative thinking was associated with perceived usefulness of the standard-style leaflet. Additionally, preference for deliberative thinking was found to be

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negatively correlated with socioeconomic deprivation, being female and being of an ethnic minority (i.e. not identifying as white).

### **General discussion**

In the United Kingdom, the current approach to cancer screening information is to provide people with factual and numerical information in a standard-style at the time of their screening invitation to support an informed choice. Such information may create communication inequalities for people with a lower preference for deliberative thinking. Difference in preference for deliberative thinking across demographic groups could be a factor affecting the equity of current cancer screening information leaflets. To examine this important, but under-researched field, Studies 1 and 2 explored associations between demographic characteristics and preference for deliberative thinking. Study 2 explored associations between preference for deliberative thinking and the perceived usefulness of two screening information leaflets, one with a standard-style design and one with a narrative-style design.

Both studies found women and people with higher socioeconomic deprivation were more likely to score low on preference for deliberative thinking. The similarity of the associations between demographic factors and deliberative thinking in Studies 1 and 2 provides support for their reliability (28). Together, these studies suggest that there is an association between gender, socioeconomic status and deliberative thinking.

In Study 2, the standard-style leaflet was rated as useful by most of the participants. This finding is in line with qualitative work exploring acceptability of information in the screening context that found that people regarded factual information as essential in making a decision about cancer screening (29). Preference for deliberative thinking was positively associated with perceived usefulness of the standard leaflet (independent of gender, ethnicity



or socioeconomic deprivation). This finding suggests that people less likely to engage with or enjoy deliberative thinking will be put at a disadvantage when receiving the standard-style information. Preference for deliberative thinking was not associated with perceived usefulness of the narrative-based leaflet (again - independent of gender, ethnicity or socioeconomic deprivation). This suggests that deliberative thinking style has a role in leaflet style preference and has important implications for achieving equitable cancer communication if we continue to use only standard leaflet types, namely that people less likely to engage or enjoy deliberative thinking (women and people with higher socioeconomic deprivation) will be disadvantaged.

The fact that people with greater socioeconomic deprivation reported lower preference for deliberative thinking suggests this population will be disproportionately disadvantaged by the use of standard-style health communication – further disadvantaging an already marginalised group. Current approaches to health communication, such as use of ‘Bowel cancer: The Facts’ may perpetuate inequities in cancer screening information, and in the support of informed choice, due to the indiscriminate use of standard-styles that favour deliberative thinking. Future attempts to communicate the benefits and harms of screening should carefully consider differences in human information processing.

The ability of narrative-style information to capture vivid and easy to imagine scenarios may give this method of communication the potential to overcome inequalities that result from differences in deliberative thinking and literacy ability (30). There has been controversy around the use of narratives in health information with research finding personal stories discouraging reasoned decision making under certain circumstances (31). This should not end the discussion but rather it should encourage a more nuanced approach to the study of narratives in health communication. One that considers how; (a) different categories of

narratives impact (b) different groups of people within (c) different decisional contexts.

Shaffer and colleagues have recently provided a way of categorising health narratives based on the results of an interdisciplinary review (32). The current study did not find such strengths of narrative style, as over 70% of the participants perceived both styles of leaflet as equally useful. However, what may be an important finding is that perceived usefulness of the narrative-style leaflet – unlike with the standard-style leaflet – did not differ across preference for deliberative thinking. Therefore, the use of narrative-based information may be beneficial for people invited to screening, irrespective of preferred thinking style. This result supports the idea that narratives tap into something different to that of the standard-style information and, with this, overcome communication disparities linked to different thinking styles.

### **Limitation.**

Future research into narrative cancer screening information will need to consider the qualities of the narrative components involved in the information being tested (33), to better understand which components may be more or less effective in conjunction with the differences in preference for deliberative thinking. The current study did not go into this level of detail and is unable to discern which elements of the narrative-style leaflet supported perceived usefulness.

A limitation of Study 2 was that the study design did not allow for a controlled comparison between the two leaflets used. The narrative information was only presented as a supplement to the standard information and was shorter than the other leaflet. To determine the real strength of narrative information it will be necessary to assess narrative-styles against other styles of health information under controlled conditions.

Both Studies 1 and 2 had low response rates of 44% (Study 1) and 32.4% (Study 2), however these are similar to the response rates of other mailed surveys (e.g., 22) and reflect a general trend of poor response to mailed surveys (30). It is likely that Study 2 received a lower response because the survey required greater time and effort compared to Study 1 due to the extra task of reading and commenting on the two information leaflets.

The outcome measures were limited to self-report and perceived usefulness was a relatively limited way of capturing how effectively each leaflet was able to communicate information about cancer screening. Within the United Kingdom healthcare system, it is the norm to be given fact-based information and this could potentially influence people's perceptions of what should be regarded as 'useful'. Where possible, a questionnaire assessing knowledge of the content of the leaflets being assessed provides a better measure to use in this instance.

The task of completing a questionnaire asking for responses to health information is deliberative in nature and may have resulted in a disproportionate non-response from people who are less likely to value deliberation. The effect this may have had on the results is unclear but it is unlikely the direction of the results would have been influenced.

The study assessed preference for deliberation but not preference for narrative information styles. Future work could consider assessing preference for narrative information styles but currently there are fewer measures available to assess this.

### **Research implications.**

Study 2 demonstrated that; i) people are disadvantaged by the deliberation-orientation of the standard leaflet, ii) our particular narrative leaflet was not found to be a useful

supplement, iii) work should continue to search for alternative leaflet styles useful for people less likely to engage in deliberation.

‘Standard-style’ information material contains several qualities that are likely to be problematic for equitable communication. For example, text-heavy information will disenfranchise people who struggle to read or understand written English and statistical health information such as prevalence and risk is often difficult for people to interpret, particularly if not elaborated on or contextualised (34). Therefore, it can be difficult to disentangle the effects of education, literacies and individual difference (such as thinking style) from one another. However, deliberative thinking remained significantly associated with perceived usefulness once controlling for age, socioeconomic status, gender and ethnic status. This suggests a unique influence of preference in deliberative thinking on perceived usefulness of standard-styled leaflets.

### **Conclusion**

Studies 1 and 2 found people experiencing greater socio-economic deprivation, women and people in an ethnic minority had lower preference for deliberative thinking. Study 2 suggested that current standard-style information materials about screening are perceived as less useful by people who are less likely to engage in deliberative thinking. Together, these findings suggest that certain – already marginalised – populations are disproportionately underserved by current screening communication of a standard-style that privilege deliberative thinking. A narrative-style – in the form of written personal stories – is shown here to be a candidate for improving equity in cancer screening communication, as this style of information does not privilege deliberative thinking.

Disengagement with information provided by cancer screening programmes jeopardises equal opportunity for cancer screening decision support and for informed choice.

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To improve access to cancer screening information, future research looking at overcoming disengagement through the manipulation of leaflet style will be crucial.

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## References

1. American Cancer Society. Cancer facts and figures 2016. Atlanta: American Cancer Society; 2016.
2. Australian Institute of Health and Welfare. Cancer in Australia: an overview 2014. Canberra: Australian Institute of Health and Welfare; 2014.
3. Cancer Research UK. Bowel cancer statistics. Available at <http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bowel-cancer#heading-One>. Accessibility verified January 11, 2019.
4. Hewitson P, Glasziou P, Irwig L, Towler B, Watson E. Screening for colorectal cancer using the faecal occult blood test, Hemoccult. Cochrane Database Syst Rev. 2007;CD001216.
5. Atkin WS, Edwards R, Kralj-Hans I, et al. Once-only flexible sigmoidoscopy screening in prevention of colorectal cancer: a multicentre randomised controlled trial. Lancet. 2010;375:1624-1633.
6. Public Health England. NHS bowel cancer screening (BCSP) programme. Available at <https://www.gov.uk/guidance/bowel-cancer-screening-programme-overview>. Accessibility verified January 11, 2019.

7. Hirst Y, Stoffel S, Baio G, McGregor L, von Wagner C. Uptake of the English Bowel (Colorectal) Cancer Screening Programme: an update 5 years after the full roll-out. *Eur J Cancer*. 2018;103:267-273.
8. Department of Health. The power of information: putting all of us in control of the health and care information we need. Department of Health, London. 2012
9. Department of Health. Bowel cancer screening: the facts. Crown copyright; 2009.  
Available at  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/739859/BCSP\\_the\\_facts.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/739859/BCSP_the_facts.pdf). Accessibility verified January 11, 2019.
10. Kahneman D. Thinking, fast and slow. New York, NY: Farrar, Straus and Giroux; 2011.
11. Cacioppo JT, Petty RE. The need for cognition. *J Pers Soc Psychol*. 1982;42:116-131.
12. Witteman CLM, Bercken JHLvd, Claes L, Godoy A. Assessing rational and intuitive thinking styles. *Eur Journal Psychol Assess*. 2009;25:39-47.
13. Ghanouni A, Renzi C, Waller J. A cross-sectional survey assessing factors associated with reading cancer screening information: previous screening behaviour, demographics and decision-making style. *BMC Public Health*. 2017;17:327.
14. Dillard AJ, Hisler G. Enhancing the effects of a narrative message through experiential information processing: An experimental study. *Psychol Health*. 2015;30:803-820.
15. de Wit, John B. F, Das E, Vet R. What works best: objective statistics or a personal testimonial? An assessment of the persuasive effects of different types of message evidence on risk perception. *Health Psychol*. 2008;27:110-115.
16. Miller-Day M, Hecht ML. Narrative means to preventative ends: a narrative engagement framework for designing prevention interventions. *Health Commun*. 2013;28:657-670.
17. Lins de Holanda Coelho G, Hanel P, Wolf L. The very efficient assessment of need for cognition: developing a six-item version. *Assessment*. 2018;107319111879320.
18. Estrada-Mejia C, de Vries M, Zeelenberg M. Numeracy and wealth. *J Econ Psychol*. 2016;54:53-63.

19. de Bruin W, McNair S, Taylor A, Summers B, Strough J. "Thinking about numbers is not my idea of fun": need for cognition mediates age differences in numeracy performance. *Med Decis Making*. 2015;35:22-26.
20. Soubelet A, Salthouse TA. Does need for cognition have the same meaning at different ages? *Assessment*. 2017;24:987-998.
21. Pacini R, Epstein S. The relation of rational and experiential information processing styles to personality, basic beliefs, and the ratio-bias phenomenon. *J Pers Soc Psychol*. 1999;76:972-987.
22. McGuinness C, Turnbull D, Wilson C, Duncan A, Flight I, Zajac I. Thinking style as a predictor of men's participation in cancer screening. *Am J Mens Health*. 2017;11:318-329.
23. Mao W, Oppewal H. The attraction effect is more pronounced for consumers who rely on intuitive reasoning. *Mark Lett*. 2012;23:339-351.
24. Epstein S, Pacini R, Denes-Raj V, Heier H. Individual differences in intuitive-experiential and analytical-rational thinking styles. *J Pers Soc Psychol*. 1996;71:390-405.
25. Robb K, Simon A, Wardle J. Socioeconomic disparities in optimism and pessimism. *Int J Behav Med*. 2009;16:331-338.
26. McGregor L, von Wagner C, Vart G, et al. The impact of supplementary narrative-based information on colorectal cancer screening beliefs and intention. *BMC Cancer*. 2015;15:162.
27. University College London. Bowel cancer screening: people's stories. National Institute for Health Research; 2012. Available at [https://static-content.springer.com/esm/art%3A10.1186%2Fs12885-015-1167-3/MediaObjects/12885\\_2015\\_1167\\_MOESM1\\_ESM.tiff](https://static-content.springer.com/esm/art%3A10.1186%2Fs12885-015-1167-3/MediaObjects/12885_2015_1167_MOESM1_ESM.tiff). Accessibility verified January 11, 2019.
28. Schmidt S. Shall we really do it again?: the powerful concept of replication is neglected in the social sciences. *Rev Gen Psychol*. 2009;13:90-100.



29. Bennett K, Wagner C, Robb K. Supplementing factual information with patient narratives in the cancer screening context: a qualitative study of acceptability and preferences. *Health Expect*. 2015;18:2032-2041.
30. Panel on a Research Agenda for the Future of Social Science Data Collection, Committee on National Statistics, Division on Behavioral and Social Sciences and Education, et al. Nonresponse in social science surveys: a research agenda. Washington, DC: National Academies Press; 2013.
31. Bekker H, Winterbottom A, Butow P, et al. Do personal stories make patient decision aids more effective? a critical review of theory and evidence. *BMC Med Inform Decis Mak*. 2013;13:S9-S9.
32. Shaffer VA, Focella E, Hathaway A, Scherer L, Zikmund-Fisher B. On the usefulness of narratives: an interdisciplinary review and theoretical model. *Ann Behav Med*. 2018;52:429-442.
33. Shaffer VA, Zikmund-Fisher B. All stories are not alike: a purpose-, content-, and valence-based taxonomy of patient narratives in decision aids. *Med Decis Making*. 2013;33:4-13.
34. Petrova D, Garcia-Retamero R, Cokely ET. Understanding the harms and benefits of cancer screening: a model of factors that shape informed decision making. *Med Decis Making*. 2015;35:847-858.

## Tables

**Table 1.** Study 1 & 2 Multivariable linear regressions for preference for deliberative thinking and demographic characteristics

	Study 1 <i>B</i> (95% <i>CI</i> )	Study 2 <i>B</i> (95% <i>CI</i> )
Constant	<b>44.67</b> (40.19, 49.12)	<b>25.20</b> (21.57, 28.83)
Age (years)	-0.02 (-0.11, 0.07)	-0.04 (-0.11, 0.03)
Socioeconomic deprivation (car, house, education)	<b>-1.56</b> (-2.32, -0.79)	<i>-0.43</i> (-0.80, -0.07)
Gender (Male coded as reference)	<b>3.46</b> (2.74, 4.18)	<i>0.65</i> (0.07, 1.23)
Ethnicity (Did not identify as white coded as reference)	<i>-1.10</i> (-2.08, -0.13)	<b>-1.81</b> (-2.69, -0.94)

*Note.* *B* = unstandardized B, *CI* = confidence intervals

Bold = significant to .001

Bold and italics = sig to .01

Italics = sig to .05

**Table 2.** Study 2 – Multiple linear regressions for perceived usefulness of the standard- and narrative-style leaflets across demographic groups and preference for deliberative thinking

	Standard-style leaflet <i>B</i> (95% <i>CI</i> )	Narrative-style leaflet <i>B</i> (95% <i>CI</i> )
Constant	<b>5.88</b> (5.26, 6.51)	<b>6.76</b> (5.92, 7.60)
Socioeconomic deprivation (car, house, education)	<b>-0.36</b> (-.48, -0.24)	<b>-0.29</b> (-0.45, -0.12)
Gender (Male coded as reference)	<b>-0.28</b> (-0.47, -0.08)	<b>-0.34</b> (-0.60, -0.08)
Ethnicity (Did not identify as white coded as reference)	<b>-0.42</b> (-0.71, -0.13)	<b>-0.44</b> (-0.84, -0.04)
Preference for deliberative thinking	<b>0.04</b> (0.01, 0.07)	<b>-0.02</b> (-0.06, 0.01)

*Note.* *B* = unstandardized B, *CI* = confidence intervals