Article

Using Adult Children to Enhance Participation in Colorectal Cancer Screening

Journal of Health Management
15(4) 481–500
© 2013 Indian Institute of
Health Management Research
SAGE Publications
Los Angeles, London,
New Delhi, Singapore,
Washington DC
DOI: 10.1177/0972063413516219
http://jhm.sagepub.com

Jose A. Martínez
Manuel Ruiz
Maria del Carmen Vivo

Abstract

We pre-tested if a new communication strategy addressed to adult children could be effective in helping to improve colorectal cancer screening (CRCS) participation rates. In a first study we used a sample of undergraduate students who participated in an experiment with six different conditions to analyze their risk perceptions regarding CRCS and their family role. A second study with a portion of that sample was also achieved to give robustness to the findings. In addition, we achieved a third study using the first sample to replicate previous findings. In a fourth study we used a sample of participants above 50 years old in order to test if the responses regarding how adult children advise their parents and their perceived influence regarding adopting healthy behaviour were similar to parents' responses to the same questions. A final fifth study was achieved to inquire about the reasons why adult children would decide to advise their parents if a hypothetical marketing campaign was targeted at them. The results showed that designing a communication campaign addressed to adult children could help to increase rates. This result is mainly derived from the role adult children play in a parent's decision about health behaviour, and the willingness to influence parents to participate in the screening. Adult children could also prescribe CRCS to their parents, as health services or celebrities do. Therefore, they might help to convince the at-risk population to comply with the screening, and consequently, to enhance participation rates.

Keywords

Health management, colorectal cancer, screening, risk perceptions

Introduction

Colorectal cancer (CRC) is one of the most common diseases in the world. In the United States it is about the second or third form of cancer (see Potter et al. 2009 and Weinberg et al. 2009, respectively). In Spain, it is the second leading cause of cancer death after lung cancer in men and breast cancer in

Jose A. Martínez, Department of Business Economics of the Universidad Politécnica de Cartagena (Spain).
E-mail: josean.martinez@upct.es
Manuel Ruiz, Department of Quantitative Methods and Computing of the Universidad Politécnica de Cartagena (Spain).
Maria del Carmen Vivo, Fundación para la Formación e Investigación Sanitaria de la Región de Murcia (Spain).

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

women. Routine screening is recommended for patients over the age of 50, and earlier screening is recommended for patients with a family history of the disease (Hauer et al. 2008). This routine screening can largely reduce CRC incidence and mortality (Weinberg et al. 2009).

Currently, there are several colorectal cancer screening (CRCS) techniques: faecal occult blood testing (FOBT), barium enema (BE), flexible sigmoidoscopy (FS) and colonoscopy. These CRCS techniques are underused. As Weinberg et al. (2009) indicate, health care providers have been urged to concentrate on increasing screening rates for their patients through periodic use of any of the recommended techniques. Regrettably, participation rates for people at average risk, on average continue to lag behind those of other recommended preventive health services. This is particularly problematic, because of the benefits associated to prevention. For example, data from the Surveillance, Epidemiology and End Results (SEER) indicate that, in the United States, there was a 4.7 per cent decrease in mortality between 2002 and 2004 due to increased participation in screenings (Emmons et al. 2009). Thus, in order to improve the rate of screening, the American Cancer Society (ACS) is interested in facilitating CRCS in primary care (Potter et al. 2009).

In Spain, the problem of low compliance rates is even more serious than in other European countries. Several pilot programmes are currently being implemented in specific geographical areas using mailed invitations, but final rates range from 26 to 47.7 per cent, which are below compliance rates of other countries which apply a similar method, such as Denmark, England, France, Sweden (Nielson and Whines 1995), Netherlands (Hol et al. 2010) or Italy (http://www.osservatorionazionalescreening.it/). In addition, this rate is also below the rate of the USA, where at the present time overall rates are approaching 60 per cent for all adults in the 50–75 age group, and it is now over 70 per cent in some large group practices with coordinated outreach programmes (acknowledging that CRCS rates slightly vary by community).[1]

In order to analyze the barriers to CRCS, several studies have been carried out, with mixed results in some cases. These studies have focused on explaining compliance through external factors to patients (providers, health care system, etc.) and internal (socio-economic status, knowledge about CRC or CRCS, risk perception, etc.). Examples of these investigations are Courtier et al. (2002), Emmons et al. (2009), Nielson and Whines (1995), Stacy et al. (2008), Weinberg et al. (2009). In general, some factors explaining non-compliance are (Stacy et al. 2008): not finding the time to get tested, pain, inconvenience, fear of cancer diagnosis, forgetting to get tested, embarrassment, the belief that tests may be inaccurate, cost of screening tests, cost of treatment if diagnosed with CRC, preparations involved, lack of recommendation by primary physician and/or health care provider, lack of trust in screening facility and/or health care provider and the possibility of being treated unfairly by screening facility and/or health care provider. In addition, improving screening colorectal rate requires a greater understanding of the relationship between CRC related knowledge, beliefs, personal risk perceptions and affective responses. Weinberg et al. (2009) concluded in their study that there was no consistent relationship between knowledge, risk perception and screening intent. Knowledge about the disease alone would be an inadequate stimulus to screening adherence.

By knowing the factors which increase or decrease the probability of compliance, public institutions and organizations may intervene in them, in order to try to enhance compliance rates. For example, Potter et al. (2009) showed that reminder calls (together with exam-room posters) to patients to encourage CRCS in busy primary care offices where patients are present for episodic care yield a slight, but significant, effect on CRCS rates. Courtier et al. (2002) found that if subjects were visited by a trained

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

non-health professional who supplied them with the invitation letter and containers, and agreed to collect the specimens from the participant's home, then participation rates raised from 36.5 per cent to 57.7 per cent. In addition, Jepson et al. (2007), recommend providing better information regarding contextual factors to make sense of the screening test (disease being screened, risk factor and symptoms) instead of only concentrating on providing information about the benefits and limitations of screening.

Therefore, communication is a key factor in increasing the compliance rate of CRCS (and other types of screening, such as, for example, breast cancer screening (see Hann 1999)). Improving the communication system is essential to obtain higher levels of adherence to the screening, because communication involves patient education and information. Nevertheless, not all of the forms of communications are equally feasible. For example, reminder calls from public health services and the strong involvement of doctors are powerful ways to increase rates. However, in the first case it is difficult for public health government (at least in Spain), to implement a global procedure involving health workers to make a monitoring plan of patients (several reminder calls and mailed invitations). In the second case, this is the most effective way to get compliance, but experience shows that it is also difficult to motivate all doctors and nurses in the same form in order to get a high involvement. Using trained non-health professional to interact, face to face, with subjects is also very effective, but costs are estimated around 5 Euros per subject (Courtier et al. 2002). If this method is extended to a general screening programme covering all the country, cost would be above 50 million Euros.

Acknowledging that the direct interaction between health services and patients is a very powerful way to improve compliance (Yanovitzky and Blitz 2000); we centre our research in a complementary source of information patients receive from family. We believe that improving some factors associated to the marketing communication strategy compliance rates might be slightly enhanced. Therefore, acting on marketing communication strategy outside the health system–patients direct relationship, would complement other strategic actions directly addressed to them.

As marketing literature has shown (for example, Childers and Rao 1992) family is an important reference group influencing individual decisions. Some important decisions about purchasing products are often discussed among family members, where adult children have a noticeable influence on parents' final decisions (Kaur and Singh 2006). If we apply this reasoning to decisions related to health behaviour and prevention, adult children could influence parents' behaviour, considering that adult children of the risk population (above 50 years) are in the vast majority of cases adults (above 20 years). Consequently, parents could discuss the decision about participation in the screening with their adult children, because this is an important decision related to health. As Zhao and Xie (2011) show, recommendations from close others impact near-future preferences more than those from distant others. Therefore, adult children could be important to convince their parents to make a significant short-term decision, such as complying with the screening.

Therefore, the aim of this research is to pre-test if a new marketing communication strategy addressed to adult children could be effective in helping to improve CRCS participation rates. Consequently, we propose a new way of setting pilot programmes for early detection, making communication and awareness efforts with the adult children of the population at risk. So, we analyze the potential influence from the adult children to their parents to perform the test. As far as we are aware, this is the first research in CRC literature focusing on a new potential marketing strategy addressed to adult children. Therefore, this study may add value to the understanding of the behaviour of the risk population when they are screened.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

Risk Perception of Adult Children and Influence on Parents

We hypothesize that adult children may influence a parent's decision to participate in the CRCS through two factors: risk perception and perceived influence on parents' decisions. These are two mechanisms that may affect, jointly or independently, how sons and daughters would try to convince their parents to participate in the screening.

We based this reasoning on the several models proposed in literature to explain individual behaviour from risk perceptions. Menon et al. (2008) made a review of them, proposing a conceptual model which tries to integrate other traditional models, such as the Health Believe Model (Becker 1974) or the Theory of Reasoned Action (Ajzen and Fishbein 1975). Basically, perception of risk is positively associated to future intentions of behaviour and effective behaviour, subject to several moderator factors related to individual and contextual factors. These moderator factors would explain why, for example, predictions based on the Health Believe Model sometimes fail (see Nielson and Whines 1995), that is, why increasing risk perceptions would not always increase intentions or effective behaviour. For example, Gladwell (2002) indicates how research found out that some smokers overestimate their risk perception but they continue smoking. Recently, using neuroscience, Lindstrom (2008) shows how anti-smoking campaigns cause the opposite effect on smokers, because rough messages of danger do not yield any emotion related to fear or prudence but desire and anxiety. However, and acknowledging that in some instances the positive association between risk and behaviour may not be met, extensive literature supports this relationship (see Wardle et al. 2004). Therefore, and as a general statement, increasing risk perception would increase the probability of obtaining the desired behaviour in the majority of cases. Consequently, it is a reasonable strategy for policy makers, and thus it is plausible to hypothesize that risk perceptions of adult children regarding a parent's disease would be positively associated to the influence they make on their parents regarding CRCS.

The second factor which would increase the probability of adult children influencing parents health behaviour is related to the perceived influence adult children believe they exert on their parents' decisions. This is based on the Theory of Reasoned Action (Ajzen 1991). Thus individuals will increase their motivation to achieve a behaviour if they think this behaviour will be significant to others they love. In other words, if adult children perceive that parents value their opinion to make a decision regarding health behaviour, then adult children will be much more motivated to try to influence their parents' decisions. This is also consistent with research about incentives (see Ariely 2010). Thus if individuals think that their assistance to others regarding behavioural decisions would be important to them, then they will be more prone to assist them, because they feel they would be rewarded by others' recognition. Consequently, to the extent that discussions of health related decisions among family members increase, then adult children will increase their efforts to convince their parents to achieve the desired behaviour. In addition, and taking basic principles of social psychology into consideration (Morales et al. 2007), influence will be higher because of the familiarity of the source of information (adult children) and the acknowledgement of the social validation behaviour (it is an action that will be achieved by most individuals).

Therefore, in order to analyze if a communication strategy addressed to adult children will work, we must analyze: (*a*) the perception of risk of adult children regarding a parent's disease; (*b*) if risk increases to the extent that adult children are better informed regarding CRC; (*c*) the role of adult children regarding decisions related to the health behaviour of their parents; (*d*) the intentions of adult children to influence a parent's decisions regarding participation in the screening.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

The remainder of the article is as follows: We depict the method and results of five studies using disparate samples and research techniques. Studies 1 and 2 address all the research questions proposed on a sample of undergraduate students. Study 3 replicates results of the first study on a new sample of students. Study 4 compares some responses provided by young people in the first studies with the responses provided by the risk population, in order to analyze if there was bias in the perception of adult children regarding their family role, from the viewpoint of parents. Study 5 directly explores reasons why adult children would decide to advise their parents if a hypothetical marketing campaign were addressed to them. Finally, the implications of all the empirical findings are discussed at the end of the paper.

Studies 1 and 2

Method

We designed an experiment with undergraduate students in our university. We announced that our department was going to do an experiment related to concerns of social interest, and alumni participation was requested. Participation was voluntary, and they were rewarded with a number to participate in drawing lots for an electronic device valued at 125 Euros. A total of 201 students wanted to participate, and they individually came into a room equipped with a personal computer. They had to answer the questions appearing automatically on the computer, and one of the authors was always in the room to assist students if they had any queries regarding the questionnaire.

We created six experimental conditions, and participants were randomly assigned to each treatment. All treatments had the same questions regarding risk perception, the role of adult children regarding decisions related to health behaviour of their parents and the intentions of students to influence parent's decisions relating to participation in the screening. The difference among each condition was the type of information provided regarding CRC. For the first treatment, no information was provided. For the second treatment, only a brief explanation regarding CRCS was added. For the third and fourth treatments an extensive explanation regarding the disease and CRCS was provided. The difference between both treatments was the place where this information was shown. In the third treatment this information was provided before participants read any question, while in the following one, treatment information was shown once participants had answered questions relating to risk perception and the role of children regarding decisions linked to the health behaviour of their parents. In the fifth treatment, written information regarding CRCS was completed with real ads from the mass-media campaign (television spots and graphical ads). Finally, in the sixth treatment, we completed the written information about CRCS with a simulated ad we created using fear appeal. We showed real images of tumours and a more pervasive message simulating an advertisement respecting the same format and design used by other ads of the organization (Alianza para la Prevención del Cáncer de Colon). Therefore, participants did not know this latter ad was fictitious.[2]

Information provided from the CRCS was written following the suggestions of Colditz et al. (2000), Keller and Lehman (2008), Menon et al. (2008), Raghubir (2008) and Weinstein (2004), regarding how to more efficiently communicate messages. Therefore, special interest was addressed to factors such as to focus more on losses than gains, to provide hope in order to counteract the effect of anxiety, to stress the social consequences of the disease, to focus on the long-term consequences of the disease or to write the numeric information (ratios, probability, etc.) using a form participants correctly interpret.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

All the used scales were 7-point type, because of the desired properties of this kind of scale (see Cox 1980; Martínez and Ruiz 2011 or Miller 1956). In addition, risk perceptions were also measured on a 0–100 per cent scale, following Weinstein and Diefenbach (1997). For the treatments four to six, a final question was included regarding if risk perception had changed, in order to measure the effect of communication on risk from within a treatment perspective. Moreover, all questionnaires inquired about knowledge of family or friends with the disease. Finally, an open question regarding the influence of adult children on a parent's health behaviour was included.

All respondents had to provide no personal information, but they had to provide an email address, in order to be able to contact the winner of the raffle. We used these email addresses to contact them again three months later, in order to investigate the stability of their risk perceptions. Schmidt Hunter (1999) recommend considering transient errors (measurement errors associated to participants' humour, emotions, mental effort, etc., which has to be evaluated in two disparate moments of time) when possible. Therefore, a second study was carried out via email. Eighty-two of the 201 students agreed to participate. The questionnaire was simpler than before, only enquiring about risk perceptions, because we thought that this variable would be prone to be unstable. In addition a final question regarding if they were subject to any communication impact regarding colorectal cancer in the last three months was added, in order to control any possible change of conditions.

Results and Discussion

Regarding risk perceptions, we compared results between the third treatment (A) and the remaining conditions (B). Recall, that in the third treatment, written information regarding CRCS was provided before inquiring about risk perceptions. Table 1 shows results based on robust statistics (see Algina et al. 2005a, 2005b; Wilcox 2010). All data was transformed into a [0, 1] interval.

Table 1. Risk Perceptions

	Father		Mother		Father-Mother		Knowledge of the Disease	
	A	B	A	B	A	B	A	B
Mean	0.26	0.25	0.22	0.21			0.28	0.34
Trimmed mean 5 per cent	0.23	0.22	0.18	0.18			0.26	0.34
Huber M Estimator	0.23	0.22	0.18	0.19			0.25	0.32
Robust Cohen's D	–0.021		–0.005				0.31	
95 per cent CI for Robust D	(–0.425; 0.376)		(–0.33; 0.40)				(–0.08; 0.78)	
Non-pooled Robust D					–0.191	–0.168		
95 per cent CI for Non-pooled Robust D					(–0.32; –0.06)	(–0.439; 0.105)		

Source: Author's own elaboration.
Notes: A: No information provided
B: Written information provided

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

First of all, there were no significant differences between groups: Robust Cohen's D was non-significant for fathers (–0.021) and mothers (–0.005). Consequently, information about CRCS did not increase risk perceptions. It is true that confidence intervals around effect sizes were not small, so it was difficult to provide a definite conclusion about effect size. This is mainly due to the low sample size of the third group. However, after seeing the robust measures of the central location (trimmed mean and Huber M), it is plausible to think that risk perceptions are very similar. In addition, perception of risk was significantly lower for mothers than fathers when no information was provided (non-pooled robust $D = –0.191$; $p < 0.05$). This latter result is in agreement with other studies reporting that some individuals erroneously think that this is a man's disease (Weinberg et al. 2009). Moreover, participants with a member of their family having the disease had a similar risk perception for fathers (Huber M estimators were equivalent), but a significantly higher risk for their mothers (Huber M increased from 16.8 to 30.8). This latter result indicates that for people with a family history, CRC is not a 'male' disease.

Second, participants numerically estimated with great precision the risk of their parents. Taking a prudent rank from 18 to 24 per cent of risk, derived from the disparate robust estimators, this interval covers approximately the probability of having the disease for people between 50 and 69 years old (this probability is around 22–25 per cent depending of the consulted source). Therefore, there is no miss-perception of risk. Note that we did not provide any specific information about the degree of risk of their parents, we only mentioned that 1 of 16 persons will develop the disease in the future, according to the statistics provided by the Health government. Consequently, it seems that awareness of the disease is in an appropriate level for participants in order to infer risk, although knowledge about the disease is below 0.5. Again, we have low power to infer that the written message yielded differences in knowledge because 95 per cent CI for Robust D contains zero, although effect size seems to indicate the contrary (Robust Cohen's $D = 0.31$).

Third, these numerical risk perceptions mean an improbable risk using verbal labels. Note that we also measured risk perception using a verbal seven-point scale: totally improbable, very improbable, improbable, moderate probability, probable, very probable and totally probable. Results indicate that these numerical perceptions of risk mean an improbable risk. For participants, a moderate probability means a risk about 36 per cent (and not 50 per cent as maybe should be expected), so correspondence between verbal labels and numerical values has to be made with a lot of caution. Consequently, it seems that although adult children do not underestimate parents' risk, many of them think that this risk does not mean a severe threat, that is, it is improbable their parents have the disease.

Fourth, stability of risk perceptions is a matter of concern. We compared risk perceptions of the same subjects in the second study with responses given in the first one (see Table 2). To guarantee the same conditions we only considered participants pertaining to the first treatment (no information regarding CRCS). Spearman correlations among answers of the final 17 participants who met the conditions were 0.629 and 0.516 for fathers and mothers, respectively. Although low sample size is a limitation for confidently interpreting results, it seems that these reliability values are not very good. However, the Wilcoxon test for paired samples yields non-significant results (0.284 and 0.319), so distributions are very similar. One of the possible explanations for the under-correlated scores could be uncertainty in the responses. We gave the opportunity to participants to provide risk perceptions using a punctual value and a range of uncertainty if they considered this necessary. A considerable amount of participants (38.8 per cent) provided uncertain responses. The mean of the range of uncertainty was 20 per cent for fathers and 17 per cent for mothers. This indicates that there is a margin where many participants evaluate risk perceptions. If this source of instability is joined to random, transient and specific measurement errors

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

Table 2. Change in Risk Perceptions by Treatment

	Treatment 4	Treatment 5	Treatment 6	
	Written message	Written message plus real spots and graphical ads	Written message plus simulated fear appeal ad	Total
Now I think my parents have lower risk than before	6	7	8	21
My risk perception has not changed	14	13	9	36
Now I think my parents have higher risk than before	15	15	14	44
Total	35	35	31	101
Chi-square	4.22	3.00	2.02	8.19*
Phi	0.35	0.29	0.25	0.28*

Source: Author's own elaboration.
Note: *p-value < 0.05.

(Schmidt and Hunter 1999), this could explain why it would be difficult to obtain higher correlations between two numerical perceptions.

Probably a more reliable measure of risk perception arises from the fourth to six treatments. As we have explained, in these questionnaires a final question regarding whether risk perception had changed was included, once participants had received different information regarding colorectal cancer: a written message, a written message plus real spots and graphical ads, a written message plus simulated fear appeal ad. Results are shown in Table 2. We find a very similar pattern of responses for the three experimental conditions, thus these three forms of communicating the message yielded similar effects. And these effects were slight but positively significant, that is, adult children now think that their parents have a higher risk than before. Low power for each of the three conditions impedes obtaining significant results, but if the three conditions are aggregated we see that Chi-square is significant, and Cramer's Phi effect size is 0.28.

Once the perceptions of risk have been analyzed, the following step is to analyze the role of adult children regarding decisions related to health behaviour of their parents, and intentions of adult children to influence a parent's decisions concerning participation in the screening. All results are shown in Table 3.

Table 3. Role of Adult Children Regarding Decisions Related to Health Behaviour of their Parents

	Advice Regarding Health Behaviour[a]	Perceived Influence on Parents Regarding Adopting Health Behaviour[a]	Parents Consider Adult Children' Opinion before Achieving a Preventive Medical Test[a]	Adult Children would Try to Convince Parents to Do Preventive Medical Tests[a]
Mean	0.62	0.48	0.30	0.46
Trimmed mean 5 per cent	0.63	0.48	0.28	0.46
Huber M Estimator	0.66	0.49	0.25	0.47

Source: Author's own elaboration.
Note: [a] Data transformed into a [0,1] interval.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

First, we were interested in knowing how adult children advise their parents and their perceived influence regarding adopting healthy behaviour. We omitted responses of participants assigned to the third treatment, because information regarding the disease could give a biased response to this type of question. Therefore, results derived from responses to the remaining conditions show that adult children advise their parents to a laudable degree, that is, many times (about 0.65 on a unit scale). However, they perceive their influence is not such important (about 0.49). However, we may interpret this score in a positive fashion, because around 50 per cent of influence means that adult children are partly responsible for a parent's health behaviour. In addition, the Spearman correlation between both variables is 0.52. We can consider this value as a high effect size (see Cohen 1988), and indicate that perceived influence is associated with the implication of adult children in the health behaviour of their parents. This association could be false, that is, explained by a latent factor such as the degree of family ties among members of the family unit. Therefore, this indicates that stimulating participation of adult children in the health behaviour of their parents could modify a parent's behaviour.

Second, and regarding specific medical tests (periodical check-ups, blood-tests, mammograms…) adult children recognized their parents do not count on them frequently (about 0.25). However, adult children would be willing to insist more strongly that they must do these preventive tests compared to how parents consider their opinions (about 0.47).

Third, we directly asked participants whether they would try to convince their parents to participate in the CRCS. This question was always made after participants had received the different types of messages, except for the first treatment where no information was provided. As Table 4 shows, when information about CRCS was provided, participants enhanced their intentions to convince parents. The difference among the disparate types of information were not significant (we had low power to detect the presumably small effect size), but when the responses of all these treatments were aggregated, we obtained clear evidence of the effect of the information provided on participant's intentions (D = 0.63).

Fourth, we inquired about the effect their opinion would yield on a parent's behaviour regarding participation in the screening. In this case, no significant effect was found between treatment 1 and the

Table 4. Participants would Try to Convince their Parents to Participate in the Screening

	Treatment 1	Treatment 2	Treatments 3 and 4	Treatment 5	Treatment 6	Treatments 2 to 6 Aggregated
	No Information Provided	Scarce Information Provided	Written Message	Written Message Plus Real Spots and Graphical Ads	Written Message Plus Simulated Fear Appeal Ad	Information Provided
Mean	0.54	0.69	0.70	0.75	0.76	0.72
Trimmed mean 5 per cent	0.55	0.70	0.71	0.77	0.78	0.74
Huber M Estimator	0.58	0.73	0.71	0.82	0.80	0.77
Robust Cohen's D						0.63*
95 per cent CI for Robust D						(0.38; 0.93)

Source: Author's own elaboration.
Note: * p-value < 0.05.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

aggregated remaining treatments (Huber M Estimator: 0.64 against 0.69). These results indicate that adult children's confidence in the influence on their parents does not depend on an external stimulus, like communication about the disease. Moreover it is an indicator of the degree of dependence among family members regarding health decisions. This is a desirable result, because it indicates that social desirability bias is not a concern for this variable. In addition, scores on this variable are above the middle range of the scale. Therefore, both intentions to influence parent's decisions and self-belief regarding the real effect of their advice have a positive connotation, that is, parent's decisions partly depend on sons' opinions. Spearman's correlation between both variables was 0.45, which again indicates a considerable degree of association between adult children willingness to help their parents and the real effect they perceive is shown in a parent's behaviour.

Finally, and in order to delve further into the two latter questions, we invited participants to freely express the reasons behind their answers. Therefore, we included an open question at the end of the questionnaire. Following the principles of phenomenological research (see Thompson 1997), we analyzed responses using a hermeneutical approach. Participants wrote a total of 6056 words for expressing their thoughts. We began our analysis from the simple distinction between two categories of responses: (*a*) positive attitudes towards adult children–parent relationships; and (*b*) negative or indifferent attitudes towards adult children–parent relationships. In addition, and in agreement with phenomenological method, we were ready to codify emergent categories. Once the authors agreed about codification, interpretation of the results are the following: The aforementioned simple codification explained the majority of responses. Those who showed positive attitudes indicated that they were worried about their parent's health. In addition some of them recognized the influence of their opinions on a parent's health behaviour. The main reason for negative attitudes was related to the weak link with their parents, which was acknowledged by some participants. Sentences such as 'I have a poor relationship with my father' or 'I do not usually speak about these things with my parents' characterized this category. However we detected that some participants showed a passive attitude but not because of having poor relationships with their parents, but because their parents were health workers (physicians, nurses, etc.), thus they thought their parents would have the correct information to make an informed decision. In addition, another category was formed of participants who recognized cancer history in their family. These participants indicated that because the family lived with the disease it made members much more aware of the importance of prevention, and consequently they showed a strong desire to advise their parents. In summary, only a small amount of participants showed a negative or indifferent attitude due to their poor relationship with their parents.

Study 3

Method

We designed another experiment with business administration undergraduate students, in order to replicate some findings obtained in the first two experiments. Again participation was voluntary, and they were not rewarded any prize. However, sharing the view of Rotfeld (2003) regarding abusive research with undergraduate students, we explained to them the objectives of the study and the potential implications for the management of the Public Health Services once they finished the questionnaire. Therefore, students obtained benefits related to learning after participating in the experiment.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

In this third experiment, we only created two conditions: (*a*) no information provided regarding CRCS; and (*b*) written information regarding the disease and the screening. The former corresponded to treatment 1 of the first study (control group), and the latter to treatment 3 (experimental group). The aim was to corroborate some findings derived from the first experiment regarding risk perception and the familiar role of participants. We decided to only focus our analysis on the written message as this would be the basic form of communication between Health Services and adult children. A total of 92 students wanted to participate, and they individually answered the questionnaire; 45 pertaining to the control group and 47 to the experimental group.

Results and Discussion

First of all, results were almost identical to the first study regarding the effect of information on risk perceptions (Table 5). No significant effect was found between groups, and again perception of risk was significantly lower for mothers than fathers (this time, significant effects were found for the two experimental conditions). In addition, in agreement with the first experiment, participants with a member of their family having the disease had a significantly higher risk for their mothers (Huber M increased from 23.4 to 36.2). And again, as before, numerical estimation of risk was highly consistent with the real probability of having the disease. Consequently, awareness of the disease is an appropriate level for participants in order to infer risk, although knowledge about the disease is below the middle range of the scale. Also, we had low power to infer that the written message yielded differences in knowledge, although effect size seems to show a similar trend to before, which indicates that it is plausible that a significant effect exists. The relationship among verbal labels and numerical responses was also very similar, being a moderate probability of risk estimated at 33–39 per cent.

Again, we were interested in knowing how adult children advise their parents and their perceived influence regarding adopting healthy behaviour. We omitted responses of participants assigned to the

Table 5. Risk Perceptions Study 3

	Father		Mother		Father–Mother		Knowledge of the Disease	
	A	B	A	B	A	B	A	B
Mean	0.279	0.307	0.232	0.275			0.26	0.30
Trimmed mean 5 per cent	0.274	0.294	0.229	0.256			0.24	0.29
Huber M Estimator	0.246	0.282	0.200	0.221			0.20	0.30
Robust Cohen's D	0.035		0.053				0.38	
95 per cent CI for Robust D	(–0.41; 0.49)		(–0.30; 0.46)				(–0.09; 0.92)	
Non-pooled Robust D					–0.213	–0.201		
95 per cent CI for Non-pooled Robust D					(–0.47; –0.02)	(–0.54; –0.012)		

Source: Author's own elaboration.
Notes: A: No information provided.
B: Written information provided.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

second treatment, because information regarding disease could bias their responses for these types of questions. Therefore, results showed that adult children advise their parents to a notable extent (about 0.58 on a unit scale). However, they perceive their influence is not so important (about 0.43). These results are similar to the first study, although with a small decreasing trend. Spearman correlation was about 0.56, that is, also very akin to the earlier results. Regarding specific medical tests, results were again quite similar; adult children recognized their parents do not count on them with assiduity (about 0.25). However, and this is the only big divergence from the first study, adult children would try to convince their parents in a similar way (0.23). As the Spearman correlation between these variables was so high (0.68), this seems to indicate that the proactive behaviour of adult children advising their parents regarding health behaviour is associated to the perceived influence they have on them.

Regarding convincing their parents to participate in screening, results were quite similar to the first study (Table 6). Effect size was not significant, which indicated that trends showed in the first and third studies would advise to complete written messages with ads and graphical messages. Recall that the aggregated group created from the disparate sources of information in the Study 1 had significantly higher scores than the control group. And in relation to the effect their opinion would have on parent's behaviour regarding participation in screening, again measures of location were almost identical (Huber M Estimator: 0.65 against 0.68), and also Spearman correlation (0.42), so conclusions are inevitably the same.

Table 6. Convincing their Parents to Participate in Screening

	Treatment 1	Treatment 2
	No Information Provided	Written Message
Mean	0.59	0.67
Trimmed mean 5 per cent	0.60	0.68
Huber M Estimator	0.60	0.69
Robust Cohen's D		0.201
95 per cent CI for Robust D		(–0.25; 0.70)

Source: Author's own elaboration.

Therefore, results of this small replication of some of the questions addressed in the first experiment show a very similar pattern. It is true that in some cases low sample sizes impede their interpretation effect sizes in a clearer fashion, but trends of responses are very alike, which would reinforce conclusions derived from the first study.

Study 4

Method

A fourth study was carried out in order to compare some responses provided by young people in the first study with the responses provided by the risk population. Specifically, we wanted to test if the responses

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

regarding how adult children advise their parents and their perceived influence regarding adopting healthy behaviour were similar to parents' responses to the same questions. Therefore, the aim was to analyze if there was any bias in the perception of adult children regarding their family role, from the viewpoint of parents.

We designed a fourth study using a convenience sample of 183 individuals above 50 years of age. All these participants were alumni of a course at our university exclusively targeted to people in this cohort. Participation was voluntary, and as in the previous study, we explained to them the objectives of the study and the potential implications for the management of the Public Health Services once they finished the questionnaire

Results and Discussion

As shown in Table 7, perceptions of parents regarding the frequency of adult children advising them is virtually the same as the perceptions of adult children regarding the frequency they advise their parents, not only referring to mean values but also regarding equality of distributions (K–S test = 0.118). However, adult children underestimated their influence on parents regarding adopting healthy behaviour in a significant way. This latter result means that the influence of adult children on a parent's decision is stronger than what adult children perceive. As variable scores are above the middle range of the scale, we can conclude that there is evidence of a positive effect that adult children could exert on their parents regarding health behaviour. Again, a Spearman correlation between both variables is very high (0.68), which indicates the great association between trying to help parents and the real effect of their advice.

Table 7. Perceptions of Parents Regarding the Frequency of Adult Children Advising Them

	Advice Regarding Health Behaviour	Influence on Parents (Perceived by Parents) Regarding Adopting Healthy Behaviour
Mean	0.62	0.57
Trimmed mean 5 per cent	0.64	0.58
Huber M Estimator	0.65	0.59
Two-sample Kolmogorov–Smirnov test for equality of distribution functions	0.118	0.195*

Source: Author's own elaboration.
Note: * p-value < 0.05.

Study 5

Method

A final study was done to inquire about the reasons why adult children would decide to advice their parents if a hypothetical marketing campaign was targeted at them. The aim was to explore the reasons that would lead adult children to try to influence their parents, and more importantly, the reasons that would lead adult children not to influence a parent's decisions.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

We designed research using several of the messages that were used in the first study. We used a convenient sample of 83 business administration undergraduate students. Again, participation was voluntary, and as before, we explained to them the objectives of the study and the potential implications for the management of the Public Health Services once they finished the questionnaire. The questionnaire composed of three pages. On the first page, written information regarding CRCS was provided. On the second page, two ads were included. The first one used celebrities to endorse the message, and the second was the simulated ad using fear appeal following the principles of the Protection Motivation Model (Gallopel-Morvan et al. 2011). Finally, on the third page, and after seeing the previous messages, participants had to choose between two alternatives: to influence a parent's decision regarding screening, or the opposite option. In order to facilitate the task, participants had to write down the advantages of each of the alternatives, and also the disadvantages of both alternatives. This procedure is known as Quandary Resolution (Fransella 2003), which is a modification of the traditional ABC method used in psychology (Tschudi 1977). It is true that when the two alternatives presented are the opposite, advantages of one alternative and disadvantages of the other could be the same.[3] However, we decided to maintain the original design of the quandary, in order to elicit participant's answers using two disparate procedures. For data analysis, we aggregated the responses provided to the advantages of the first alternative and disadvantages of the second, and the responses provided to the disadvantages of the first alternative and the advantages of the second.

Results and Discussion

The vast majority of participants (92.77 per cent) resolved the quandary by choosing the first alternative, that is, to influence their parents. The advantages of choosing the first option were clearly homogeneous, because they were related to the benefits of prevention for the health of their parents. Consequently, participants correctly understood the importance of screening for preventing cancer. However, we recognize that this pattern of responses could be subject to social desirability bias (King and Bruner 2000), because it is obvious that the first alternative is related to trying to help their parents to prevent a potential threat, that is, a sociably desirable behaviour. Therefore, it would be expected that if we directly enquire into this, the answers would be positive.

Nevertheless, we think that the more important findings are derived from the responses of the disadvantages of the first alternative, that is, the possible reasons why adult children would not be prone to influencing their parents. Only 65 per cent of participants responded to this question, because the remaining students stated that there were no disadvantages. For this case, two categories of responses clearly emerged from the data: (*a*) the fear of a change in their lives if results were positive; and (*b*) not obstructing the freedom of their parents to make an important decision related to their health. One of these two reasons was at least named by 90 per cent of respondents. Other reasons had a very marginal appearance, such as: not wasting time trying to advise their parents; the screening is not 100 per cent reliable, or conflicts created within the family for trying to influence a parent's decision.

Therefore, it seems clear that adult children also identify fear with the diagnosis of cancer as a barrier to not participating in the screening, as other studies have shown when researching risk populations (for example, Stacy et al. 2008). In addition, many participants thought that they should not obstruct a parent's

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

important decision, such as compliance with screening, because their parents have to assume the responsibility to decide.

Implications, Limitations and Further Research

Improving compliance rates for CRCS is a matter of concern for policy makers of health services within different countries. In Spain, this problem is especially important because pilot programmes achieved in disparate geographical populations do not yield the expected results regarding participation, at least compared to other European countries and the United States.

A communication strategy is essential to increasing rates. Apart from stimulating direct interaction between health services (physicians, nurses) and patients, health organizations design global social marketing communication campaigns in order to make the population at risk aware of the disease and the benefits of screening. For example, in the USA, the Screen For Life Colorectal Cancer Campaign is a federally funded campaign to promote understanding of CRC and the importance of regular screening which was launched in 1999, using some celebrities endorsing the programme (Cooper et al. 2005). In Spain, during the last few months, a global mass-media campaign has been launched to raise awareness to the population most at risk using some celebrities to educate individuals about the importance of prevention for this type of cancer (www.alianzaprevencioncolon.es). This is the first global communication campaign implemented about this disease in Spain, following others related to breast, cervical or skin cancer. However, as far as we are aware, there is no communication programme specifically designed to the non-risk population.[4]

In this research we have investigated the success of a new communication campaign addressed to adult children of the population most at risk. Using five studies with disparate samples as well as different methods,[5] we have pre-tested a new way of setting the pilot programmes for early detection, making communication and awareness efforts on the adult children of the population at risk. Therefore, adult children could also prescribe CRCS to their parents, as health services or celebrities do. Consequently, they might help to convince the at risk population to comply with the screening.

Results derived from our research suggest that designing a social marketing campaign addressed to adult children could help to increase rates. This conclusion is mainly derived from the role adult children play in a parent's decision about health behaviour, and the willingness to influence parents to participate in the screening. There is a high association among proactive behaviour on parents and perceived influence they have on them. However there are cases where family ties are not so strong; adult children do not get involved with parents' decisions or they feel their opinions are not taken into account. In addition, regarding specific preventive medical tests, adult children perceive their parents do not consider their opinion very much before having any such tests. Therefore, it is plausible to think that for important health related decisions (such as a screening test) adult children have less authority to influence them. Moreover, several adult children think that for such important decisions, parents have to be free to decide independently. Students participating in our experiments were only about 21 years old (and their parents were about 50 years old). Although we acknowledge that this is a limitation to our research, we think that older and more mature adult children are much more involved in the health of parents. Obviously, this is only a statement and should be tested in further research.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

However, adult children show a considerable involvement in convincing their parents to participate in the screening. They think this is important because of the benefits associated with prevention. When information about CRCS is provided, adult children increase their willingness to help, that is, when they receive very similar information to that received by parents through a mailed initiation, adult children significantly change their willingness to advise their parents. Nevertheless, this modification in some attitudes and intentions are not so clear regarding risk perceptions. Our studies find mixed results because when risk is evaluated using a 0–100 per cent scale, it does not significantly change. We strongly believe that this is due to the considerable uncertainty associated to quantitative risk evaluations, which makes this measurement instrument not very reliable. Measuring change in risk perception using a simpler verbal scale, as we made, could be better. When using such an instrument, perceptions of risk increase when information is provided. However, further research should delve into the measurement of risk perceptions under uncertainty.

Therefore, results show that communication addressed to adult children causes variation in participants' responses. However, messages should be created considering the following:

1. Written text should be complemented with visual messages. In addition, using young celebrities to endorse the message would also reinforce the global message received by adult children.
2. Messages should stress the fact that family members do not have to worry that their current lifestyle will be affected. Families should not think about the non-desirable outcomes of the screening, but about all the positive benefits associated with prevention and the tranquillity gained if they obtain desirable results. We think this communication task is difficult, because the equilibrium metaphor is one of the most powerfully rooted thoughts of individuals, which in several cases obstruct the accomplishment of medical tests (see Zaltman and Zaltman 2008).
3. Messages should also stress that CRC is not a male disease; and that this is also a very dangerous disease for mothers, not only for fathers.

One of the advantages of designing a communication campaign addressed to adult children is the relatively low economic cost of implementation. Using simple mailed information to people, for example, between 18 and 35 years old would not be excessively demanding in cost. In addition, celebrities usually endorse health related campaigns without being paid. Consequently, young celebrities could be invited to join in the whole programme, and therefore obtain synergies with the cost of production of ads and the cost associated with purchasing time in the mass-media.

We must also acknowledge that our results are highly dependent on the samples used. Although we have used random assignation to treatments in the experiments achieved, all the participants involved in the studies were not a random sample of adult children, but a convenient sample of students. This fact implies that some variables such as socio-economic status (SES) could not be considered as required. It is true that students from our university come from a heterogeneous socioeconomic context, but we do not have total control over this variable. Recall that low SES was associated with low participation in the screening. In addition, lower SES groups evaluate screening as more frightening and less beneficial (Wardle et al. 2004). Therefore, the role of adult children of low SES might be underrepresented in our studies. Recognizing this possible limitation to our work, we also propose that further research should focus on two psychological issues: specific beliefs and self-deception, which might be also related to SES. Kramer and Block (2011) explain specific beliefs such as superstition have a greater impact on choice under uncertainty. If some people believe in magical thinking, in bad luck when having medical tests, etc., this could be an important

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

barrier to overcoming any communication strategy. In addition, as Von Hippel and Trivers (2011) discuss, people with a negative attitude toward medical testing, or towards information challenging their rooted beliefs of equilibrium would be more prone to self-deception, that is, to selective choice in the information consistent with their beliefs. Therefore, people sometimes do not tell themselves the entire truth if a partial truth appears likely to be preferable, and are often able to avoid telling themselves the whole truth by searching out those bits of truth that they want to hear, but they are also willing to face uncomfortable truths when feeling secure. Consequently, and for example, some people will give great importance to the very low probability of false positives, and this fact will guide decisions to not participate.

In addition, the parent's susceptibility to interpersonal influence is also a matter of concern. Bearden et al. (1989) introduced the idea that interpersonal influence comprises two dimensions: an informational and a normative one. The informational dimension stands for the tendency to accept information from others, and the normative dimension can be defined as the inner urge to comply with the expectation of the social environment. Our fourth study shows that the influence of adult children on a parent's decision is stronger than what adult children perceive.

In summary, our research shows that a creative strategy of communication addressed to adult children could help to increase rates in CRCS. In spite of limitations on sample sizes, our studies suggest that adult children could influence a parent's decision to participate. Certainly, results do not suggest rates would be enhanced in a very noticeable way, but in the current context of CRCS (at least in Spain), even a small increase would be highly appreciated. Recall, that as Yanovitzky and Blitz (2000) stated, even little improvements in participation rates in screening programmes are very important. Considering the results of this research, we expect some Spanish policy makers of geographical location where pilot programmes are currently implemented, to do a 'field test' of our proposal, in order to ascertain that this strategy could generally be valuable to generalize in a hypothetical full-country CRCS.

Acknowledgements

We are in debt to the Consejería de Sanidad de la Región de Murcia for promoting this research. In addition, thanks to Ricard Courtier, Michael B. Potter, Kristjan Sigurdsson, Jay Onysko, Jean-Luc Bulliard, Verena Schenk-Welker, Grazia Grazzini, Julien Wiggins, Brian Cox, Nick Reed and Iris Lansdorp-Vogelaar for their help. The first and second authors were partially supported by MINECO (Ministerio de Economía y Competitividad) and FEDER (Fondo Europeo de Desarrollo Regional) projects ECO2012-36032-C03-03 and MTM2012-35240.

Notes

1. We thank Michael B. Potter, from San Francisco Bay Collaborative Research Network, for this information.
2. The questionnaires and messages (written, spots, ads) are available from the author upon request.
3. This is not the same as when participants have to choose between two alternatives that are not necessarily the opposite. For example, when purchasing a car, two disparate cars do not necessarily have contrary features.
4. It is true that there is a very interesting marketing campaign currently achieved in Canada: 'have a colonversation' (www.cancerview.ca). This campaign promotes talking with doctors, family and friends about the disease. In the cases of family and friends, it is a form of sharing what individuals know with someone they care about. However, what we are proposing in this research is to achieve a structured campaign addressed specifically to adult children in order to influence their parent's decision regarding CRCS, that is, a more focused marketing programme than the colonversation campaign.
5. We have used mixed method research, that is, combining qualitative and quantitative methods in a single research (O'Cathain et al. 2011).

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.

Ajzen, I. & M. Fishbein (1975). A Bayesian analysis of attribution processes. *Psychological Bulletin*, 82(2), 261–277.

Algina, J., H.J. Keselman & R.D. Penfield (2005a). An alternative to Cohen's standardized mean difference effect size: A robust parameter and confidence interval in the two independent groups case. *Psychological Methods*, 10 (3), 317–328.

——— (2005b). Effect sizes and their intervals: The two-level repeated measures case. *Educational and Psychological Measurement*, 65(2), 241–258.

Ariely, D. (2010). *The upside of irrationality*. New York: Harper Collins.

Bearden, W.O., R.G. Netemeyer & J.E. Teel (1989). Measurement of consumer susceptibility to interpersonal influence. *Journal of Consumer Research*, 15(1), 473–481.

Becker, M.H. (1974). The health belief model and personal health behavior. *Health Education Monographs*, 2(4), 409–419.

Childers, T.L. & A.R. Rao (1992). The influence of familial and peer based reference group influence on consumer decisions. *Journal of Consumer Research*, 19(2), 198–211.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. New Jersey: Lawrenced Erlbaum Associates, Inc. Publishers.

Colditz, G. A., K. A. Atwood, K. Emmons, R. R. Monson, W. C. Willett, D. Trichopoulos et al. (2000). Harvard report on cancer prevention volume 4: Harvard Cancer Risk Index. Risk Index Working Group, Harvard Center for Cancer Prevention. *Cancer Causes Control*, 11(6), 477–488.

Cooper, C.P, C.A. Celb, H. Jameson, E. Macario, C.M. Jorgensen & L. Seeff. (2005). Developing English and Spanish television public service announcements to promote colorectal cancer screening. *Health Promotion Practice*, 6(4), 385–393.

Cox, E.P. (1980). The optimal number of response alternatives for a scale: A review. *Journal of Marketing Research*, 17(4), 407–422.

Courtier, R., M. Casamitjana, F. Macià, A. Panadés, X. Castells, M.J. Gil, J.M. Hidalgo & J.M. Sánchez-Ortega (2002). Participation in a colorectal cancer screening programme: Influence of the method of contacting the target population. *European Journal of Cancer Prevention*, 11(3), 209–213.

Emmons, K.M., R. Lobb, E. Puleo, G. Bennett, E. Stoffel & S. Syngal (2009). Colorectal cancer screening: Prevalence among low-income groups with health insurance. *Health Affaires*, 28(1), 169–177.

Fransella, F. (2003). Some skills and tools for personal construct practitioners. In F. Fransella (ed.) *International handbook of personal construct psychology* (pp. 105–121). Chichester: John Wiley & Sons Ltd.

Gallopel-Morvan, K., P. Gabriel, M. Le Gall-Ely, S. Rieunier & B. Urien (2011). The use of visual warnings in social marketing: The case of tobacco. *Journal of Business Research*, 64(1), 7–11.

Gladwell, M. (2002). *The tipping point*. New York: Back Bay Books/Little, Brown and Company.

Hann, A. (1999). Controversy: Propaganda versus evidence based health promotion: The case of breast screening. *The International Journal of Health Planning and Management*, 14(4), 329–334.

Hauer, K.E., L. Wilkerson & A. Teherani (2008). The relationship between medical student knowledge, confidence, experience, and skills related to colorectal cancer screening. *Journal of Cancer Education*, 23(4), 209–213.

Hol, L., M.E. Van Leerdam, M. Van Ballegooijen, A.J. Van Vuuren, H. Van Dekken, J. Rijerink, A.C.M. Van der Togt, J.D.F. Habbema & E.J. Kuipers (2010). Screening for colorectal cancer: Randomised trial comparing guaiac-based and immunochemical faecal occult blood testing and flexible sigmoidoscopy. *Gut*, 59(1), 62–68.

Jepson, R., J. Hewison, A. Thompson, & D. Weller (2007). Patient perspectives on information and choice in cancer screening: A qualitative study in the UK. *Social Science and Medicine*, 65(5), 890–899.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

Kaur, P. & R. Singh (2006). Children in family purchase decision making in India and the West: A review. *Academy of Marketing Science Review*, 10(8), 1–30.

Keller, P.A. & D.R. Lehmann (2008). Designing effective health communications: A meta-analysis. *Journal of Public Policy & Marketing*, 27(2), 1–26.

King, M.F. & G.C. Bruner (2000). Social desirability bias: A neglected aspect of validity testing. *Psychology and Marketing*, 17(2), 79–103.

Kramer, T. & L. Block (2011). Nonconscious effects of peculiar beliefs on consumer psychology and choice. *Journal of Consumer Psychology*, 21(1), 101–111.

Lindstrom, M. (2008). *Buyology: Truth and lies about why we buy*. New York: Doubleday business.

Martínez, J. A., M. & Ruiz (2011). D-test: A new test for analyzing scale invariance using symbolic dynamics and symbolic entropy. *Methodology,* 7(3), 88–95.

Menon, G, P. Raghubir & N. Agrawal (2008). Health risk perceptions and consumer psychology. In C. Haugtveldt, P. Herr and F. Kardes (eds) *Handbook of consumer psychology* (pp. 981–1010). New York: Lawrence Erlbaum and Associates.

Miller, G.A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, 63(2), 343–355.

Morales, J.F., M.C. Moya, E. Gaviria & I. Cuadrado (eds) (2007). *Psicología Social* (Social Psychology). Tercera Edición, Madrid: McGrawHill.

Neilson, A.R. & D.K. Whynes (1995). Determinants of persistent compliance with screening for colorectal cancer. *Social Science & Medicine*, 41(3), 365–374.

O'Cathain, A., E. Murphy & J. Nicholl (2011). Why and how, mixed methods research is undertaken in health services research in England: A mixed methods study. *BMC Health Services Research*, 7(1), 84–95.

Potter, P.B., Y. Namvargolian, J. Hwang & J. Walsh (2009). Improving colorectal cancer screening: A partnership between primary care practices and the American Cancer Society. *Journal of Cancer Education*, 24(1), 22–27.

Raghubir, P. (2008). The effect of denominator salience on perceptions of base. Rates of health risk. *International Journal of Research in Marketing*, 25(4), 327–334.

Rotfeld, H.J. (2003). Convenient abusive research. *The Journal of Consumer Affairs*, 37(1), 191–194.

Schmidt, F.L. & J.E. Hunter (1999). Theory testing and measurement error. *Intelligence*, 27(3), 183–198.

Stacy, R., W.A. Torrence & C.R. Mitchell (2008). Perceptions of knowledge, beliefs, and barriers to colorectal cancer screening. *Journal of Cancer Education*, 23(4), 238–240.

Thompson, C.J. (1997). Interpreting consumers: A hermeneutical framework for deriving marketing insights from the texts of consumers consumption stories. *Journal of Marketing Research*, 34(4), 438–455.

Tschudi, F. (1977). Loaded and honest questions: A construct theory view of symptoms and therapy. In D. Bannister (ed.) *New perspectives in personal construct theory* (pp. 321–350). London: Academic Press.

Von Hippel, W. & R. Trivers (2011). The evolution and psychology of self-deception. *Behavioral & Brain Sciences*, 34(1), 1–56.

Wardle, J., K. McCaffery, M. Nadel & W. Atkin (2004). Socioeconomic differences in cancer screening participation: Comparing cognitive and psychosocial explanations. *Social Science & Medicine*, 59(2), 249–261.

Weinberg, D.S., S. Miller, M. Rodoletz, B. Egleston, L. Fleisher, J. Buzaglo, E. Keenan, J. Marks & E. Bieber (2009). Colorectal cancer knowledge is not associated with screening compliance or intention. *Journal of Cancer Education*, 24(3), 225–232.

Weinstein, N.D. & M.A. Diefenbach (1997). Percentage and verbal-category scales for assessing personal risk likelihood. *Health Education Research*, 12(1), 139–141.

Weinstein N., K. Atwood, E. Puleo, R. Fletcher, G. Colditz, & K. Emmons (2004). Colon cancer: Risk perceptions and risk communication. *Journal of Health Communications*, 9(1), 53–65.

Wilcox, R.R. (2010). *Fundamentals of modern statistical methods.* Second Edition. New York: Springer.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015

Yanovitzky, I. & C.L. Blitz (2000). Effect of media coverage and physician advice on utilization of breast cancer screening by women 40 years and older. *Journal of Health Communications*, 5(2), 117–134.

Zaltman, G. & L. Zaltman (2008). *Marketing metaphoria: What deep metaphors reveal about the minds of consumers*. Boston: Harvard Business Press.

Zhao, M. & J. Xie (2011). Effects of social and temporal distance on consumers' responses to peer recommendations. *Journal of Marketing Research*, 48(3), 486–496.

Downloaded from jhm.sagepub.com at Karolinska Institutets Universitetsbibliotek on May 29, 2015