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"If only...": counterfactual thinking heightens women's sense of responsibility regarding mammography screening

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Abstract
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Keywords
only, counterfactual, thinking, heightens, women, sense, responsibility, regarding, mammography, screening

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“If only…”: Counterfactual thinking heightens women’s sense of responsibility regarding mammography screening

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Abstract

The present study tested the prediction that counterfactual thinking (thoughts of “if only…”) provides a vivid means for women to imagine what could have been done differently in hypothetical breast cancer scenarios for the protagonist to avoid their predicament. This should then encourage them to adopt a more preventative approach to and take greater personal responsibility toward their own breast health. Women aged 50 and older (N=181) read either a standard pamphlet on mammography rescreening or one containing counterfactually framed scenarios. The latter depicted fictitious women whose failure to have routine mammograms contributed to their diagnosis with advance-stage breast cancer. The counterfactual group subsequently indicated greater feelings of personal responsibility for having mammograms at the recommended interval than the standard group, even when perceived effectiveness of early detection and treatment were statistically controlled for. Our data suggest that messages utilising counterfactual thinking may be useful in augmenting the mammography rescreening rate in Australia.

Breast Cancer and Regular Mammography Screening

Breast cancer is among the most common types of cancer in women. In Australia, approximately 12,000 new cases of breast cancer are diagnosed each year (Australian Institute of Health and Welfare, 2006). Regular mammography screening of asymptomatic women is thus far the most effective way to detect breast cancer early (National Cancer Institute, 2006a). The importance of early detection lies in its role in facilitating timely treatment, because the treatment required for more advance-stage breast cancers is typically more aggressive, and has been associated with greater mortality rates (National Cancer Institute, 2006b).

Australia is one of the countries that have a well-established national mammography screening program. The service in Australia is freely available to all women aged 40 and over. Since the risk of breast cancer tends to increase with age (National Cancer Institute, 2006b), women between 50 and 69 years of age are particularly targeted and encouraged to have a mammogram every two years. However, similar to other countries such as the United States and Canada, more than 40 percent of Australian women of this targeted screening age group do not obtain mammograms at the recommended two-year interval (Australian Institute of Health and Welfare, 2006).

A number of psychosocial and knowledge factors have been shown to differentiate regular mammography screeners and those who failed to adhere to the recommended screening regime. Among other factors, having better knowledge about screening and the benefits of screening (Achat, Close, & Taylor, 2005; Fox, Arnsberger, Owens, Nussey, Zhang, Golding, et al., 2004), having more positive health beliefs and behaviours (Halabi, Skinner, Samsa, Strigo, Crawford, & Rimer, 2000; Rutter, Calnan, Field, & Vale, 1997), and an expressed belief that having mammography screening would reassure others (Mah & Bryant, 1997) have all been associated with regular mammography screening.

Of particular relevance to the present study, a strong sense of responsibility for their own health and wellbeing, and a sense of communal responsibility to act as a role model in the family have also been identified as important factors in helping women to continue attending regular mammograms (Ahmed, Elzey, Fort, & Bailey, 2004). Can this sense of personal responsibility toward regular mammography screening be fostered in women through a suitable intervention strategy?
Counterfactual thinking and adaptive behaviour

Counterfactual thinking involves mentally altering some aspect(s) of a factual event and evaluating the imagined alternative against reality. This type of thinking often involves musings of "what if..." or "if only", and is particularly common when people reflect on negative events and experiences (for a review, see Roese, 1997). For example, on being diagnosed with breast cancer, a counterfactual thought such as "if only I had been more diligent with having mammograms..." may come readily to a woman's mind.

Counterfactual thinking has been shown to be present in even three- to four-year-old children, and competence in counterfactual thinking is associated with children's theory of mind development (German & Nichols, 2003; Guajardo & Turley-Ames, 2004). The latter involves the ability to consider and provide relevant judgement from others' perspectives. This is crucial in enabling individuals to think counterfactually not only just about their own experience, but also to contemplate the antecedents and consequences of other people's behaviour.

By mentally comparing an objective outcome against an imagined and often better potential alternative, a key function of counterfactuals is that it can heighten individuals' intention to engage in more adaptive behaviour. From a health promotion perspective, counterfactual thinking has been shown to increase individuals' intention to practise safe sex via the use of a condom (Gleicher, Boninger, Neter, Collins, Diggins, Currier, & Thakkar, 1994, cited in Gleicher, Boninger, Straithman, Armor, Hetts, & Ahn, 1995). Also, by taking a story character's perspective regarding a hypothetical smoking-related lung cancer scenario, and thinking counterfactually about how the protagonist's circumstances could have been better, college students have been found to be more willing to sign up for a lung capacity test as a preventative measure for their own lung health (Page & Colby, 2003).

Purpose of the present study

In this paper, we report a preliminary study that examined how counterfactually-framed messages might be related to women's subsequent report of a sense of personal responsibility toward regular mammography screening. We used a hypothetical scenario paradigm conceptually similar to that reported in Page and Colby (2003). Specifically, we compared whether or not reading a publicity brochure containing counterfactually-framed messages about mammography screening — compared to a standard brochure that contained general information about breast cancer and available mammography screening service — might be associated with women subsequently reporting a greater sense of personal responsibility to attend mammography screening as per BreastScreen Australia's recommended two-year interval. We also explored whether or not any relationship found between counterfactual thinking and personal responsibility might be mediated by women's perceptions regarding the benefits of early detection and treatment of breast cancer.

Method

Participants

Our sample consisted of 181 Illawarra-based women aged 50 and over (M=63.5 years, SD=9.04). Participants were volunteers recruited through social and community groups, as well as large employers in the Illawarra region (e.g., university and local council). Eleven women (6.1%) had previously had breast cancer, and 60 (33.6%) had one or more family members who had breast cancer. Seventy-six percent of the women were born in Australia. Participants were assigned randomly to a counterfactual condition (N=85) or a standard condition (N=96) (see Materials section for details). There was no significant difference between the two groups with regards to personal or family history of breast cancer, education level and country of birth.

Materials

We generated a breast screening questionnaire that consisted of two parts. Part A contained questions about the participant’s background (e.g., age, country of birth, education level) and experiences with breast screening (e.g., history of mammography screening, types of breast cancer detection measures used previously, personal and family history of breast cancer). We also included a series of questions that assessed participants’ attitude toward the effectiveness of early detection and treatment of breast cancer in saving lives and allowing the person to live a normal life. A 7-point Likert scale was provided to answer each of these latter questions.

Part B of the questionnaire contained one of two different brochures — a standard brochure or one that incorporated counterfactually-framed messages (see below). This was followed by questionnaire items that assessed participants’ evaluation of the information in the brochure (via 5-point scales), and items that assessed their attitude toward routine mammography screening and their sense of personal responsibility regarding biennial routine mammography screening (with answers to be provided on a 7-point Likert scale). The questionnaire item that assessed personal responsibility was the statement, "It is my personal responsibility to ensure that I attend breast screening every two years" (1 = "strongly disagree, 7 = "strongly agree"). For participants who were
given the brochure with counterfactually-framed messages, the questionnaire also included an item (on a 5-point scale) that assessed women's ease of imagining themselves to be one of the women in the brochure.

Both brochures were A4-sized, double-sided, and printed in full colours using similar colour schemes. The standard brochure was the "It's time for your next breast screen" information brochure produced by BreastScreen NSW, which was available publicly at most healthcare facilities (e.g., GPs' surgeries and medical centres) and via the internet until late 2006. One side of this brochure contained information about the prevalence rate of breast cancer in women in NSW, the free breast screen service offered by BreastScreen NSW, and the mammography screening procedure. The reverse side contained details on how women could make an appointment for mammography screening and/or gather more information about BreastScreen's services. There was also a small section that encouraged women to obtain a screening mammogram every two years, to have a clinical breast examination by healthcare professionals, and to check for and report any changes to their breasts.

For the brochure with counterfactually-framed messages, the first side contained two hypothetical scenarios about the experience of two fictitious women. Each scenario had a paragraph describing a woman of target mammography screening age who failed to attend mammography screening at the recommended two-year interval, and had just been diagnosed with advance-stage breast cancer (Stage 2 and Stage 3A, respectively). Each scenario continued with a list of anecdotal remarks regarding regular mammography screening supposedly given by the protagonist. These remarks incorporated common misconceptions of and barriers to mammography screening identified in another study (Jones, Rich, & Chan, 2007). Each set of anecdotes ended with the statement, "If only..." To illustrate, one of the scenarios is set out below:

Jenny attended screening for breast cancer once when she was in her early 50s, but has not had a mammogram since then. Recently she saw her GP about a general health complaint. The GP performed a clinical breast examination on Jenny and discovered a lump in one of her breasts. Jenny was referred to take further medical examination, and was later diagnosed with Stage 3A breast cancer.

When asked about her previous history of breast screening mammography, below were some of Jenny's reactions:

"I have always been in good health and have never found anything wrong with my breasts..."
Table 1: Mean ratings on evaluation of brochure and baseline perception and attitude measures.

<table>
<thead>
<tr>
<th>Item description</th>
<th>Standard</th>
<th>Counterfactual</th>
</tr>
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<tbody>
<tr>
<td><strong>Baseline perceptions of effectiveness of early detection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness of early detection of breast cancer in saving one’s life</td>
<td>6.25 (1.23)</td>
<td>6.16 (1.36)</td>
</tr>
<tr>
<td>(1 = “not at all effective”, 7 = “extremely effective”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness of early detection and treatment in allowing one to live a normal</td>
<td>6.19 (1.22)</td>
<td>6.00 (1.27)</td>
</tr>
<tr>
<td>life (options as above)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation of brochure information</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ease of making sense of brochure information (1 = “very difficult”, 5 = “very</td>
<td>4.82 (0.53)</td>
<td>4.83 (0.46)</td>
</tr>
<tr>
<td>easy”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How convincing was brochure information (1 = “very unconvincing”, 5 = “very</td>
<td>4.57 (0.67)</td>
<td>4.41 (0.84)</td>
</tr>
<tr>
<td>convincing”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ease of imagining oneself to be one of the women in the brochure (1 = “very</td>
<td>3.39 (1.50)</td>
<td></td>
</tr>
<tr>
<td>difficult”, 5 = “very easy”)</td>
<td></td>
<td></td>
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</tbody>
</table>

Standard deviations appear in parentheses

**Results**

Our preliminary analyses showed no baseline differences between the two groups in participants’ perceived effectiveness of early detection and treatment of breast cancer. There was no difference between the counterfactual and standard groups in their evaluation of the version of the brochure that they read either (see Table 1 for mean ratings on relevant variables). Participants in the counterfactual condition found it moderately easy to imagine themselves to be one of the women in the brochure. Overall, both groups of participants had very positive attitudes regarding the effectiveness of early detection and treatment of breast cancer in saving a woman’s life (thereafter referred to as SAVE) and in allowing one to live a normal life (thereafter referred to as NORMAL). Furthermore, both groups considered their version of the brochure to be easy to comprehend and the information convincing.

Of key interest to the present study was whether or not the two groups differed in their endorsement of the statement on personal responsibility toward biennial mammography screening. We found that the counterfactual group had a higher mean rating ($M = 6.73$, $SD = 0.87$) than the standard group ($M = 6.38$, $SD = 1.42$), $t(175^d) = 2.00$, $p = .05$, Cohen’s $d = .29$.

Next, we examined how perceived effectiveness of early detection might mediate any difference between the two groups in participants’ reported personal responsibility toward biennial mammography screening. We conducted an analysis of covariance (ANCOVA) on the personal responsibility ratings, with groups as the independent factor. Ratings on SAVE and NORMAL were included as covariates. After controlling for the effects of SAVE ($F(1,172) = 0.72$, $p = .40$) and NORMAL ($F(1,172) = 11.99$, $p = .001$), we found that the mean personal responsibility rating of the counterfactual group was significantly higher than that of the standard group, $F(1,172) = 6.25$, $p = .01$.

**Discussion**

In the present study, we have obtained preliminary support for the notion that counterfactual thinking can be useful in augmenting women’s sense of personal responsibility toward regular mammography screening. We found that women in our counterfactual group reported higher ratings about their personal responsibility to attend mammography screening every two years as recommended to all women aged 50 to 69 years, even after their perceived effectiveness of the benefits of early detection and treatment of breast cancer was statistically controlled for.

It may be argued that our observed group difference might be due to factors other than counterfactual thinking *per se*. Our data have ruled out the possibility that the counterfactual group simply found the information in their brochure more convincing and easier to understand than that in the standard brochure. Instead, by being able to identify with the fictitious characters depicted in the brochure, women in the counterfactual group might more readily consider the material they read to be personally relevant than women in the standard group, which in turn might have heightened their judgment of personal responsibility regarding regular mammography screening. This possibility warrants further systematic investigation.

Another potential alternative explanation of our findings was that there might be *a priori*
differences between our two groups’ sense of personal responsibility regarding regular screening. Although this possibility cannot be ruled out from our available data, on the basis of participants’ data on their perceptions of effectiveness of early detection and treatment, we reason that any preexisting group difference in participants’ sense of personal responsibility toward regular screening would also be minimal. Certainly, further research is needed to provide conclusive evidence on this issue.

A noteworthy difference between the two brochures was that while the counterfactual version encouraged perspective taking and reflection regarding the protagonists’ breast cancer diagnoses, the standard brochure provided general information regarding breast cancer prevalence and practical information on where women could obtain a mammogram. The standard brochure was therefore supposed to enrich women’s knowledge about breast cancer and mammography screening, which has also been shown to significantly predict regular mammography screening adherence (e.g., see Achat et al., 2005). In other words, the standard group in the present study also received some form of intervention. Arguably then, although we have found that the counterfactual group had significantly higher ratings of personal responsibility toward mammography screening than the standard group, the present findings may have underestimated the effectiveness of counterfactual thinking as a novel communication tool to increase women’s sense of personal responsibility regarding regular mammography screening. More important though, our data suggest that an intervention strategy involving counterfactually framed messages may offer a useful different approach to complement information brochures in encouraging regular mammography screening. It would be instrumental for future studies to examine the effects of counterfactual thinking more closely against those of other existing interventions.

It should be noted that, regardless of group membership in the present study, participants had very positive a priori reports regarding their perception of the effectiveness of early detection and treatment of breast cancer. To establish the generalisability of the present findings, replication of the present study will be necessary.

Thoughts of “if only” have been shown repeatedly to be a powerful tool to prepare individuals better for possible future events in their everyday life. We have provided early evidence that such thoughts may also be useful in empowering women of recommended mammography screening age with a greater sense of personal responsibility toward their breast health. The major challenge for researchers is to see how this sense of responsibility may translate to greater actual adherence to regular mammography screening.

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References