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Research paper

Preferences for cervical cancer screening: The role of implicit associations

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ABSTRACT

Objectives: Implicit associations influence behaviour, but their impact on cancer screening intentions is unknown.
Methods: We assessed implicit associations with cervical cancer screening using an evaluative priming task. Participants were shown primes ('Pap test', neutral or non-word) followed by positive or negative target words. The test is based on the assumption that response times are shorter if primes and targets are strongly associated in the participant's mind. The Dutch screening program targets women aged 30–60, 226 of them completed online assessments twice. Prior to the second assessment participants were randomized to reading versus not reading the leaflet about the cervical screening program.
Results: After controlling for knowledge and screen history, response times for 'Pap test' no longer differed between positive and negative targets. Implicit associations were not correlated with explicit attitudes or screening intentions. Reading the screening leaflet resulted in improved knowledge levels ($p < 0.001$), but implicit associations, explicit attitudes, and screening intentions remained similar.
Conclusion: Cervical cancer screening intentions were related to explicit attitudes, but not to implicit associations. The screening leaflet did not affect screening intentions.
Practice implications: We recommend achieving a deepened interest in the screening program among risk groups, e.g. by adapting the information leaflet.

1. Introduction

Implicit associations have been shown to affect consumer behaviour and decision making [1–3]. Cialdini provides famous examples in his book 'Influence, the psychology of persuasion' [4], showing that, for instance, when people perceive goods to be scarce they become more interested in buying these goods. People are drawn to articles that are exclusive ('limited edition'). So far, however, implicit associations have not been explored in health related behaviours and it is largely unknown if and how implicit associations also impact medical decision-making such as participating in cancer screening. In Western countries the decision to accept or decline participation in cancer screening programs is considered a matter of individual choice [5,6]. In this view, people are entitled to weigh the positive and negative aspects of a screening program and then make an autonomous, informed choice about their participation [7]. Following Marteau et al., an informed choice is defined as a choice that is based on relevant knowledge with the individuals' attitudes being consistent with actual behaviour [8]. From this perspective, non-participation in a screening program is a perfectly acceptable outcome of a decision process, if based on sufficient decision-relevant knowledge and in line with the individual's attitude towards participating in the specific program [8]. One might expect that weighing positive and negative aspects of a screening program would result in positive attitudes and likely participation in those groups who are at highest risk of cancer and may benefit most from a screening program. However, in practice the uptake of cervical screening is below average among women with low socio-economic status, a group whose cervical cancer risk is above

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average [9]. This leads one to believe that non-participation may not always be the result of an informed choice [9].

Attitudes can be implicit and explicit. Implicit attitudes, which we will refer to as implicit associations, are defined as highly accessible, evaluative representations [10] that are automatically activated even in the absence of an intention to evaluate the object [11]. Implicit associations are based on automatic associations [3,12–15] and can guide people's behaviour without their conscious awareness [16]. An important characteristic of implicit associations is that they are activated irrespective of whether that person considers these associations to be correct [12]. Persons thus do not necessarily endorse their implicit associations [12]. For instance, an implicit association test (IAT) may reveal negative associations with older people while someone considers these associations as undesirable. Explicit attitudes are more or less deliberate and conscious, and are not necessarily correlated with implicit associations [17–20]. According to Gawronski and Bodenhausen an explicit attitude is the product of a propositional evaluation while implicit associations are the product of an associative process [12]. In their associative–propositional evaluation (APE)-model they describe the underlying mental processes of evaluative responses, which can be associative or propositional. They argue that associative processes provide the basis for primitive affective reactions and are characterized by mere activation. Propositional processes are assumed to form the basis for evaluative judgments and are concerned with the validation of evaluations and beliefs [12]. In practice, people will often react based on their first associations, i.e. on their implicit associations, rather than on deliberate decision strategies, i.e. their explicit attitudes [1,21,22]. This may help explain why women who have a higher risk of cervical cancer, and who thus may benefit most from early detection through screening, do not participate in screening.

Possibly actual screening behaviour is not always driven by explicit intentions, but sometimes depends more strongly on automatically activated associations. If we wish to better understand non-participation in screening, then it may be relevant to address implicit associations with cancer screening in addition to explicit attitudes. Such implicit associations have not been assessed so far.

We aimed to measure women's intentions to have or to decline the cervical cancer screening test, and the associations of these intentions with women's implicit associations with and explicit attitudes towards this test. Additionally, we wanted to know if and how knowledge about cervical screening programs was related to women's implicit associations and explicit attitudes. Finally, we assessed the associations between educational level, screening history, implicit associations, explicit attitudes, and intentions to participate. With these aims we developed the necessary methodologies.

2. Methods

During the study, in the Dutch national cervical cancer screening program, women aged 30–60 are invited once every five years to attend cytological cervical cancer screening (using a so-called Pap test), with the aim of early detection and treatment of (pre)cancerous stages, and improving survival. Participating in this program does not entail financial costs for the individual participant. Nationally, the 5-years coverage is 77% [23]. Many women usually participate but occasionally skip a screening round, for instance due to pregnancy.

2.1. Sample

Female participants in an online Dutch panel aged 30–60 were asked to complete two online assessments within a two-week interval. The participants were a representative sample of the Dutch population in terms of age (in the specific 30–60 group), education level, and regional spread.

2.2. Study design

At baseline, all participants were given a short description of the Dutch national program for cervical cancer screening (see Appendix). They were then asked to imagine they had been invited to have cervical screening and to indicate their intention to accept this invitation. Next, they completed an evaluative priming task to assess their implicit associations with the cervical cancer screening test, followed by a questionnaire containing a measure to assess their explicit attitudes towards this test as well as questions to assess knowledge about the cervical cancer screening program. The order of assessments was chosen such that neither the measurement of explicit attitudes nor the measurement of knowledge could affect participants' implicit associations.

At the follow-up assessment, participants were randomly assigned to one of two conditions. Participants in the Leaflet condition were asked to read the information leaflet that is sent to all women who are eligible for a screening round in the national cervical cancer screening program (available from http://www.rivm.nl/dsresource?objectid=rivmp:58256&type=org&dispositio-n=inline&ns_nc=1). Participants in the Control condition did not receive additional introductions or materials, they were just asked to imagine they had received an invitation to participate in cervical screening. Participants in both conditions were subsequently asked to complete the same assessments as at baseline.

Participants were asked to indicate their age. Information about educational level was provided by the host of the panel. We asked participants whether they ever had been invited to participate in the cervical cancer screening program, whether they ever participated, and whether they ever had an unfavourable screening test result. We hypothesized that educational level and a history of screening tests may be associated with higher levels of knowledge about the screening program and potentially impact implicit associations with and/or explicit attitudes towards screening.

2.3. Implicit associations

2.3.1. Evaluative priming task

Validated measures to assess implicit associations with screening programs or other preventive health behaviour were not available at the time of the study. Therefore, we adapted an evaluative priming task, a widely used task in social cognition research that was originally developed to assess attitudes towards social groups or activities. We programmed the task into Qualtrics software (version 4.2015) using the QRTEngine program [24]. In this task a participant is first shown a prime on a computer screen. The prime can be a picture or a word, for instance 'holidays'. Then a target is shown, for instance the word 'good' or the word 'bad'. Next, the participant is asked to indicate if the target is negative or positive by pressing a key. Participants were asked to perform this task while trying to maximize both speed and accuracy of their responses. The task relies on the assumption that the prime automatically activates an evaluation, and that if primes and target words are strongly associated in the participant's mind, the participant will react more quickly [25]. Response times to the target words are therefore considered to indicate implicit positive or implicit negative associations with the prime. For instance, if a participant has a positive association with a primed word such as 'holidays', she will respond more quickly to a target word that is positive (e.g., 'good'), but more slowly to a target word that is negative (e.g., 'bad').

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