

WHY WON'T THEY PARTICIPATE? BARRIERS
TO PARTICIPATION IN WORKSITE HEALTH
PROMOTION PROGRAMS

by

S. Toker*
C. A. Heaney**
D. Ein-Gar*

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* Faculty of Management, The Leon Recanati Graduate School of Business
Administration, Tel Aviv University, Tel Aviv, Israel.

** Department of Psychology, Stanford University, CA, USA.

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Why Won't They Participate?

Barriers to Participation in Worksite Health Promotion Programs

Abstract

Although research suggests that worksite health promotion (WHP) programs can be effective in enhancing employee health, 50-75% of employees choose not to participate in such programs when offered. The present study's aim is to identify the underlying barriers to participation in two distinct phases of a WHP program (web-based health risk assessment and a group workshop), using a large random sample of university employees that includes both participants and non-participants. Employees (n=1926) completed an anonymous web-based survey and reported whether they participated in each stage of the program and what the barriers to participation were. Although the results indicate that employee characteristics (such as age and gender), type of job, and employee perceptions of their health and their organization are all associated with non-participation, the magnitude and nature of these associations differ across the two phases of the WHP program. In addition, the reasons employees gave for their non-participation differed across sub-groups of employees defined by the characteristics listed above. We discuss how future research on WHP programs can build on these findings and propose a theoretical framework for participation enhancement.

Key words: Worksite health promotion (WHP), participation, barriers

Introduction

Worksite health promotion (WHP) programs (also referred to as wellness / health management / health enhancement programs) are employer initiatives directed at improving the health and well-being of employees (Abraham & Graham-Rowe, 2009). WHP programs are offered by more than 40% of the employers in the US (Carnethon et al., 2009; Linnan et al., 2007), and they are considered to be cost-effective (for a review, see Chapman, 2005; Goetzel & Ozminkowski, 2008). Four recently published meta-analyses and reviews have shown these programs to have substantial physiological, behavioral and work-related benefits for the employee as well as for the employer (Abraham & Graham-Rowe, 2009; Anderson et al., 2009; Conn, Hafdahl, Cooper, Brown, & Lusk, 2009; Goetzel & Ozminkowski, 2008).

Notwithstanding, a substantial proportion of employees (50%–75%) choose not to participate in WHP programs (Linnan, Sorensen, Colditz, Klar, & Emmons, 2001; Robroek, van Lenthe, van Empelen, & Burdorf, 2009). These high non-participation rates have been documented across various organizations and WHP programs, including educational or counseling programs, fitness programs, and multi-component programs (67%, 73% and 51% non-participants respectively; Robroek et al., 2009).

Given the magnitude of non-participation, studying the barriers to participation is of great importance. However, most of the theory and research related to WHP has focused on evaluating the effectiveness of WHP, whereas few studies have examined the barriers to participation (For review, see Linnan et al., 2001; Robroek et al., 2009; Weiner, Lewis, & Linnan, 2009). Moreover, the studies that have addressed these barriers have several shortcomings.

The first shortcoming is that most organizations and researchers do not collect data that allow post-hoc comparisons between participants and non-participants, and those who

have collected such data have not published it. For instance, a recent review of WHP studies shows that out of 24 studies, only 2 compared characteristics of participants to those of non-participants (Bull, Gillette, Glasgow, & Estabrooks, 2003). Moreover, many studies do not show how many participants are excluded from the final sample. Bull et al. (2003) concluded that it is impossible to discern the extent to which study participants represent the general workforce, and suggested that there may be a tendency for highly motivated, healthy employees to self-select for these programs. Unless the organization offering a WHP program has extensive demographic, occupational and health-related background data on all employees, it is almost impossible to identify the barriers to participation in the program on the basis of data gathered solely from employees who choose to participate.

The second shortcoming relates to the large variety among WHP programs, with different programs offering somewhat different clusters of activities. Such activities can include health risk assessment surveys (HRA), physical activity classes, health education sessions, smoking cessation aids, etc. Different activities potentially target different groups of employees, and they vary in magnitude, in duration and in the level of employee involvement and effort required. Moreover, while employers and researchers tend to report an overall participation rate, participation rates may vary across different components of a single program. Thus, in order to understand the barriers to participation in a given WHP program, one has to clearly define the different steps or components of the program and to identify the barriers related to each of these steps.

The third shortcoming relates to the types of barriers to participation discussed in the literature. In order to fully understand the barriers, one should consider two types of barriers, which we refer to as explicit barriers and potential barriers. *Explicit barriers* are those barriers explicitly reported by employees, such as lack of time or lack of motivation. *Potential barriers* are objective characteristics (e.g., gender) or subjective characteristics

(e.g., self-rated health) of employees that may be empirically associated with the likelihood of participating in WHP programs. Although a better understanding of potential and explicit barriers could yield much insight, a review by Robroek et al. (2009) indicates that the research done thus far on non-participants has focused mainly on objective characteristics such as being a man or having a lower position at work and not on potential subjective characteristics or explicit barriers. The studies reviewed by Robroek et al. (2009)—with the exception of three studies, which we will discuss below, did not include any data relating directly to *non-participants*, and did not address employees' perceptions and beliefs, thus limiting the ability to draw conclusions about specific determinants of non-participation.

Aim of This Study

The present study's aim is to focus on the explicit and potential barriers to participation while contributing to the literature on WHP programs in the following ways: (a) addressing a unique and large sample comprised of both participants in a comprehensive WHP program and non-participants; (b) identifying explicit and potential barriers to participation; (c) exploring the possible relations between explicit and potential barriers; and (d) finding out whether specific barriers are associated with specific stages of WHP programs. In what follows we will describe the research setting in which this study took place, as this setting sheds light on hypotheses formulation. We will then review the handful of studies that relate directly to explicit barriers and will subsequently describe the potential objective and subjective potential barriers to participation.

Research Setting

In the winter of 2008, a US university initiated a comprehensive WHP program that was offered to all 13,500 employees. The program included the following three consecutive steps, and completion of each step was mandatory in order to proceed to the next step: (a) completing an online Health Risk Assessment (HRA) survey and immediately receiving

detailed feedback with recommendations for behavior changes as well as \$150 in a subsequent paycheck; (b) attending a one-hour group workshop where the results and feedback of the HRA are elaborated on and general recommendations for lifestyle changes are given; (c) attending one or more of the university's various health-related activities, workshops and classes for a reduced fee of \$20 per academic term.

The first step (HRA) is considered to be a relatively effortless stage, and program administrators anticipated that most employees would participate, given the generous monetary incentive. The second stage, attending the workshop in order to be able to participate in the WHP program's activities, can be seen as a real 'foot in the door', and hence represents employees' actual motivation and personal interest in the program. Rates of participation in this stage are expected to be somewhat lower than those in the first stage, as this stage demands more effort on the part of the employee (setting a time, getting there, etc.).

Although substantial efforts were invested in advertising the WHP program across the campus, the majority of the university's employees chose not to participate. Six months after the program was launched, 51% of the employees had not yet completed the first step (HRA), and 85% had not completed the second step (workshop)¹. As noted above, these non-participation rates are not exceptional; however they were a cause for concern for the university's management. In an attempt to understand the reasons for the programs' success or failure, 6 months after the program was launched, we surveyed a large random sample of employees ($n = 5000$, comprising both participants and non-participants) in order to uncover the explicit as well as potential barriers to participation.

¹ The data for the present study were collected before some of the activities of the third step started. Therefore, it was impossible to collect non-response data on the third step.

Barriers to Participation

Explicit Barriers to Participation

Explicit barriers to participation refer to the reasons employees give when asked why they have not participated in a WHP program. We refer to these reasons as ‘explicit’ because the non-participating employees tie them directly with non-participation. Most studies to date have not gathered data on explicit barriers to participation, nor have they included non-participants in their samples. To the best of our knowledge only three studies have asked employees to name explicit barriers to participation in WHP programs.

Kruger et al. (2007) examined barriers to and facilitators (incentives) for potential participation in various WHP programs (including exercise and weight-loss-related activities) among 2,337 employed adults who completed the 2004 HealthStyles mail survey (62.1% response rate). The authors found that the explicit barriers and facilitators mentioned were related mainly to time and location issues. However, a major shortcoming of their study was that respondents reported on participation intentions, whereas actual participation in WHP programs was not measured. In addition, the authors did not tie specific explicit barriers with different components of WHP programs, thus ignoring the possibility that some barriers may apply to specific WHP activities (e.g, HRA survey completion), but not to others (e.g. physical activity classes).

Titus-Howard et al. (2009) measured employees' perceived barriers to health improvement, as part of a survey that was administered among 14 Kansas City Region employers. The survey measured knowledge of and receptivity to changing unhealthy behaviors among 7,077 employees (21.4% participation rate). The salient barriers reported were lack of motivation, having no time, and lack of programs at the worksite. As in the study by Kruger et al. (2007), respondents reported their intentions to participate and not their actual participation. In addition, although the authors tied specific barriers to specific health

changes (e.g., lack of motivation was a major barrier for smoking cessation but not for healthy eating), the associations between specific explicit barriers and specific WHP components (e.g. HRA surveys, educational workshops, etc.) were not specified.

The only study that looked at explicit barriers to participation in an actual participation setting was conducted by Crump and colleagues (1996). Using both qualitative and quantitative data from an employee survey ($N = 3,388$, 59% response rate) in 10 federal agencies, the researchers identified potential barriers and facilitators for workers' participation (e.g., time and location) and then aggregated them into a composite score that represented the extent to which the organization successfully reduced barriers to participation; this score significantly correlated with employee participation rates in health-related- fitness- and health risk assessment activities. Unfortunately the specific barriers were not fully described, and the relationships of each barrier or facilitator s with non-participation were not explored. Therefore, although a unique sample of participants and non-participants was used, the paper did not describe the specific barriers identified, their prevalence was not reported, and there was no clear differentiation between barriers and facilitators.

Although the three studies described above point to three types of explicit barriers— (a) having no time (during or after work), (b) lacking motivation to participate, and (c) inconvenient location—the studies' shortcomings point to a need for a more comprehensive methodological framework that includes employees that chose not to participate in a given WHP program (as opposed employees who intended not to participate in a future potential program), and a broader list of explicit barriers to two distinct WHP stages (HRA and workshop). In an attempt to broaden the scope of explicit barriers, tie specific barriers to each stage of the WHP program, and find their prevalence among certain groups of employees, we adopted an exploratory approach and did not formulate specific hypotheses regarding the explicit barriers. As will be elaborated in the Method section, we conducted a preliminary

study that enabled us to generate a list of explicit barriers to participation that included barriers such as not knowing about the HRA survey, perceiving it as not valuable, having technical problems, or worrying about one's confidentiality.

Although the various explicit barriers we consider seem to be more comprehensive than those that have been studied thus far, they basically represent employees' subjective reports on their own behavior, and therefore may be subject to actor-observer bias (where people tend to attribute own actions to situational factors such as shortage of time, cognitive dissonance, or recall bias, Jones & Nesbit, 1971). Nevertheless, we assume that not all explicit barriers are subject to attribution biases and even if an attribution error or a recall bias occurs, it is still worthwhile to find out which types of employees tend to report on each barrier. For instance, in a study that assessed intentions to participate in WHP programs, women and younger employees were more likely to report on tiredness and lack of interest as barriers, compared to men and older employees (Kruger et al., 2007).

Potential Objective and Subjective Barriers to Participation

While *explicit* barriers to participation refer to reasons employees give when asked why they do not participate in a given WHP program, *potential objective and subjective* barriers refer to personal, organizational or contextual characteristics that have the potential to influence one's decision to participate or not. We claim that, although referred to in the literature mainly as 'characteristics of participants' (e.g., Lerman & Shemer, 1996), each of these characteristics may pose specific barriers in a given organizational context. Herein we describe two kinds of potential barriers: *objective barriers*, which are stable, "given" characteristics (e.g., gender), and *subjective barriers*, which include employees' health-related perceptions (e.g., importance of making a lifestyle change).

Objective potential barriers to participation. Two reviews thus far (Glasgow, McCaul, & Fisher, 1993; Robroek et al., 2009) have addressed the objective characteristics of study participants (but not of non-participants) in WHP programs. Participation in WHP programs was shown to be mainly associated with age, gender, and position at work. Although this information was gathered mainly from participants and was not compared to the total workforce (Robroek et al., 2009), we will review each of these objective characteristics and will explain why it constitutes a potential barrier to participation in each step of a WHP program.

Age. One of the often-reported demographic determinants of non-participation in WHP is age. According to Robroek et al. (2009), there are contradictory and inconsistent results among various studies, with both higher and lower participation rates among older employees. In an attempt to account for these inconsistencies, we propose that older age poses a barrier for certain WHP activities, while younger age poses a barrier for others. To demonstrate, completing a web-based HRA requires computer and internet skills and older employees may be less likely to have these skills, as suggested by the knowledge gap hypothesis (Bonfadelli, 2002). On the other hand, attending a workshop may be more difficult for younger employees who have tighter schedules (especially if they have young children) and a lesser ability to control their work schedules. Following this rationale, we formulated the following hypothesis:

Hypothesis 1: Older employees will have higher rates of non-participation in the HRA, while younger employees will have higher rates of non-participation in the workshop.

Gender. Another demographic determinant of non-participation is gender. Robroek et al.'s review of WHP studies (2009) revealed significantly higher participation rates among

women than among men.. Higher percentages of women were found mainly in educational and multi-component WHP programs, but not in interventions consisting of fitness center programs. Men are also more likely than women to maintain unhealthy lifestyle behaviors (Dodson, 2007). The low proportion of men among WHP participants may reflect a potential barrier such as considering WHP activities as somewhat feminine in nature or refraining from revealing health-related weaknesses in public (Bauerle, 2011; Courtenay, 2000). Therefore, we expect to find lower participation rates among men in both stages of the WHP program.

Hypothesis 2: Men will have higher rates of non-participation in the HRA and in the workshop compared to women.

Position at work. Past studies found higher participation rates among white-collar employees (Crump et al., 1996; Sorensen, Stoddard, Ockene, Hunt, & Youngstrom, 1996) and among employees with higher education or income levels (for a review, see Robroek et al., 2009). In the academic setting, education level is generally related to employees' positions at work. Therefore, one may expect to find lower participation rates among employees in positions that entail lower occupational status, owing, in part, to limited access to organizational resources and knowledge, lower job flexibility, or work-home conflict (e.g., having a second job).

Hypothesis 3: Employees in lower status jobs will have higher rates of non-participation in the HRA and in the workshop compared with employees in higher status jobs.

Subjective potential barriers to participation. Participation in a WHP program can be seen as an act of health-related help-seeking; it involves being diagnosed (HRA), getting health-related advice (workshop), and engaging in various activities to promote one's health

(for a review on help-seeking, see Bamberger, 2009). An employee's participation in a WHP program may thus imply that he or she is seeking health-related help in the workplace.

According to Nadler's work (1991), in order for an employee to seek health-related help, three critical elements must be present: a person in need of health-related help, a source of help, and a specific desire to obtain help. In the context of WHP programs, each of these three elements is subject to the employee's health-related perceptions. First, *the person in need* can be seen as an employee who perceives his health to be impaired and wants to improve it, or an employee who perceives his health as good and wants to maintain it. Second, the degree to which the employee perceives the organization to be committed to his or her health may determine whether the organization will be considered as *a source of help*. Third, the degree to which it is important for the employee to make a lifestyle change (and thus change his current lifestyle, whether optimal or not), will determine whether there is a *specific need for help*. As will be elaborated in what follows, we assume that a perceived lack of one of the above three elements may hamper help-seeking and thus pose a potential barrier to participation in WHP programs.

Self-rated health. Assessing employees' health is the first step in most WHP programs (e.g., HRA, health screening). However, it is somewhat difficult to determine whether impaired health or good health will pose a barrier to participation. Employees who assess their health as good may either be motivated to participate in order to maintain their healthy lifestyle at work or lack any motivation to participate because they already maintain a healthy lifestyle outside the workplace or feel they do not need to change their current lifestyle. Likewise, employees who rate their health as poor may be either more motivated or less motivated to participate in WHP programs. They may choose not to participate because they have low risk perceptions, low self-efficacy, or low outcome expectations (Schwarzer, 2008). On the other hand, such employees may choose to participate in order to find out what

their real health status is (i.e., by taking the HRA) or getting some guidance through their participation in the workshops.

These conflicting scenarios are reflected in the findings of past studies that looked at objective measures of impaired health such as being overweight, having high cholesterol or having high blood pressure. These objective measures were found to be associated with both *higher* and *lower* participation rates in WHP programs (for a review see Robroek et al., 2009). Nevertheless, these objective measures do not necessarily promote our understanding of the role of perceived health in the decision to participate or not, as they do not represent employees' global subjective health assessment (e.g., "I have high blood pressure but I am a very healthy person in general"). In an attempt to move beyond specific health impairments and to reflect employees' general subjective health, we focus on employees' *self-rated health* as a potential subjective barrier to participation. Self-rated health has been shown in numerous studies to predict mortality and survival after adjustment for traditional risk factors, socio-demographic characteristics, and objective measures of health status, and hence is considered to be a valid measure of one's general health (for a meta-analysis, see DeSalvo, Bloser, Reynolds, He, & Muntner, 2006). To the best of our knowledge, self-rated health has not been assessed as a possible barrier to participation in WHP programs. We therefore hypothesize that self-rated health will be associated with non-participation, although we do not have a preliminary assumption as to whether this will be a positive or a negative association.

Hypothesis 4: Self-rated health will be associated with non-participation in a WHP program.

Importance of making a lifestyle change. As presented above, in order for an employee to seek health-related help in the form of WHP participation, he or she must have a specific need for help. As WHP programs involve mainly changes in lifestyle behaviors such

as physical activity, smoking habits and diet, it is important to find out to what degree the employee believes that it is important to make these changes. To the best of our knowledge, no study to date has looked at employees' perceptions of the importance of making a lifestyle change as a predictor of participation or non-participation in WHP programs, although the importance of measuring motivation for lifestyle change was stressed in a recently published review of WHP programs (Goetzel & Ozminkowski, 2008) and in health change models such as the Health Action Process Approach (Schwarzer, 2008). We therefore assume that employees who are not interested in making a lifestyle change will tend not to participate.

However, as discussed earlier, different phases of a WHP program may involve different barriers. Completing an online HRA survey (and receiving a monetary incentive for doing so), does not necessarily have to be perceived as helpful or supportive of a lifestyle change. In contrast, attending a workshop in order to be able to join the WHP program's activities may demand a higher level of motivation, as this is the real 'foot in the door'. Therefore, we hypothesize the following:

Hypothesis 5: Lower levels of perceived importance of making a lifestyle change will be associated with non-participation in WHP program, mainly in the 'active' stage (i.e. the workshop).

Organizational commitment to employees' health. As a WHP program is offered, subsidized and managed by the organization, it is important to find out whether employees perceive the organization as truly committed to their health (i.e., as a real source of health-related help). Organizational commitment to employees' health, defined as an objective organizational structure that supports engagement and dissemination of health promotion programs, has been found to be a significant predictor of participation in WHP programs (Taitel, Haufle, Heck, Loeppke, & Fetterolf, 2008). However, even within an 'objectively' committed workplace, diverse evaluations can be found among different employees; these

subjective evaluations may eventually hamper or promote participation behavior, and hence have the potential to serve as a potential subjective barrier.

Perceived organizational commitment to employee health draws in part on the construct of perceived organizational support (POS). POS relates to employees' general beliefs that their workplace values their contributions and cares about their well-being (Rhoades & Eisenberger, 2002). The consequences of high POS include, among others, affective commitment to the organization, lower strains, higher job satisfaction, better mood, higher performance and fewer withdrawal behaviors (for a review on POS, see Rhoades & Eisenberger, 2002). Withdrawal behaviors refer to employees' lessening of their active participation in the organization. As both HRA survey completion and workshop attendance are organizationally recommended, non-participation in each of these stages may reflect a withdrawal behavior. On the basis of the above arguments, we put forward the following hypothesis, which has not been explored in prior studies:

Hypothesis 6: The lower an employee's perception of the organization's commitment to employees' health, the higher the chances of non-participation.

In summary, in this study we integrate for the first time explicit and potential objective and subjective barriers among a sample of participants and non-participants in two stages of a WHP program. With no prior findings to rely on, this study is partially exploratory in nature, and hence no specific hypotheses are put forward regarding the specific associations between potential and explicit barriers.

Method

Design

Eight months after the WHP program was launched, we surveyed 5000 university employees (of whom 2035 responded) and asked them to elaborate the following: (a) their demographic and health-related characteristics (i.e. the potential barriers); (b) the extent of

their participation in the HRA and in the workshop; and (c) among those who had not participated, the nature of the explicit barriers to participation.

Procedure

In early August 2008 the university's HR division provided us with a random sample of email addresses for 5,000 employees (35% of the university's employees). A web-based survey was administered with a preliminary email notification sent beforehand. Two days after the notification, an official e-mail invitation to complete the survey was sent with a link to the web-based survey attached. As an incentive, we offered the first 100 participants who completed the survey a free gift card for one fruit smoothie at a local juice bar. Two follow-up e-mail reminders were sent during the two weeks that followed the first e-mail. The study was approved by the university's ethics committee.

Sample Characteristics

Following the four emails that were sent, 2035 out of 5000 employees (40.7%) completed the web survey. These respondents included participants as well as non-participants in the HRA and the workshop. We excluded 109 employees from the sample owing to missing data; we found that except for age differences (those with missing data were a bit older), there were no differences between the excluded employees and the other respondents. Due to confidentiality restrictions within the university, no population characteristics of the employees were available to the authors, except for gender distribution and participation rates in the WHP program. The gender distribution among the survey respondents (65% women) was very similar to that of the overall employee population (63% women). Likewise, the percentage of non-participants in the HRA among survey respondents (40%) was similar to the percentage of non-participants reported by the university authorities,

one month before the survey was sent to the employees (49%). As we assume that in the month that passed additional employees joined the WHP program, the percentages of participants and non-participants in our survey seem to reflect the population studied. The final sample characteristics appear in Table 1.

Survey and Measures

With the assistance of the WHP program staff, we designed a self-administered anonymous web-based survey. The survey had to be extremely short owing to university restrictions, the large number of surveys administered to employees, and the nature of the sample (e.g., employees who had chosen not to respond to an HRA even though they would receive \$150 were being asked to complete our survey for a chance to receive a \$5 gift card). Within these restrictions, the survey assessed the characteristics of participants and non-participants (i.e., objective and subjective potential barriers) as well as the explicit barriers to participation in the two different stages of the WHP program (HRA and workshop). The survey was edited and revised by the researchers and the WHP program's staff until a consensus was reached, and the clarity of the survey was assessed via five cognitive walk-through interviews with employees in different positions.

After accessing the web survey, respondents were presented with a message assuring their anonymity. The objective and subjective characteristics (i.e., potential barriers) were then introduced. Afterwards, respondents were asked whether they had participated in the HRA. For those who had not, a list of explicit barriers appeared and respondents were asked to check all that applied. In addition, an open text box was presented in which respondents were asked to report on additional barriers that came to mind. The subsample of employees who had participated in the HRA were introduced to another question asking whether they had participated in the workshop. Again, for those who had not participated, a list of explicit

barriers appeared, and respondents were asked to check all that applied. Here as well, an open text box was presented, asking respondents to report on additional barriers that came to mind.

Explicit barriers. We built the list of explicit barriers using an exploratory approach. First, the WHP program staff were interviewed and listed the possible reasons for non-participation in the HRA and the workshop, as reflected in conversations they had had with non-participants. After an initial list was built, we held cognitive interviews with 10 employees; interviewees were asked to name possible barriers to participation, and then they were shown the list and were asked whether they would add or delete any reason. Third, after the survey had been administered, we coded an additional barrier (exercising at home) on the basis of respondents' entries in the open text-boxes. After the survey was administered, two independent expert judges coded the explicit barriers into conceptual categories. The barriers to participation in the HRA were categorized as follows: *Didn't know*: 'I didn't know about the HRA survey'; *Low value*: 'I did not believe it would improve my health', 'I did not think \$150 was worth the effort'; *Time*: 'I did not have time to complete the HRA'; *Technical problems*: 'I could not find the survey', 'I thought it was too complicated'; *Confidentiality*: 'I did not want to give any personal information'. The barriers to participation in the workshop were categorized as follows: *Low value*: 'I did not think it was worth the effort', 'I did not think I would benefit from the workshop'; *Time & location*: 'I did not like the scheduled times', 'I did not like the location', 'I could not attend them while at work'; *Technical*: 'I did not know how to register', 'I had troubles registering'; *Exercise on my own*: 'I train at home', 'I have a personal trainer', 'I maintain my own health'.

Participation. Participation in the two different stages of the WHP was measured using the following two questions: (A) "Have you completed the HRA?" and (B) "Have you participated in the workshop?"

Objective implicit barriers. Respondents reported their *gender*, *age category* (20–29, 30–39, 40–49, 50–59, 60+) and *position at work*; we classified the latter according to the following five categories: academic, management, professional, administrative and blue-collar units.

Subjective implicit barriers. *Self-rated health* was measured by a single item: "In general, how would you rate your health?" Response categories included the following: 'excellent', 'very good', 'good', 'fair', and 'poor'. This single-item measure was found in several meta-analytic studies to be a valid tool for identifying persons with the greatest health needs and to have predictive validity relative to the criteria for all-cause morbidity and mortality (for a meta-analysis, see DeSalvo, et al., 2006). Additionally, this single-item measure demonstrated good reproducibility, reliability, and strong concurrent and discriminant scale performance with an established multi-item measure of health status (e.g., DeSalvo, et al., 2006).

Importance of making a lifestyle change was measured by a single item: "How important is it for you to make a lifestyle change to improve your health?" Response categories included the following: 'not important at all', 'a little important', 'somewhat important', and 'very important'.

Perceived organizational commitment to employees' health was measured by a single item: "How committed do you think your organization is to the health of all its employees?" Response categories included the following: 'not committed at all', 'a little committed', 'somewhat committed', and 'very committed'. Due to the small number of respondents who

marked the category 'not committed at all', we combined it with 'a little committed', and thus our final measure included three categories².

Statistical Analysis

We conducted the analysis in several consecutive steps: First we compared the characteristics of HRA participants with those of non-participants. This analysis involved the whole sample ($N = 1926$). Then, for each potential barrier, we divided employees into sub-categories () and conducted a χ^2 test, comparing the frequencies of participation and non-participation in the HRA across the different groups of employees (Table 1, left column). In order to reveal the specific unconfounded contribution of each objective and subjective barrier to the prediction of non-participation in the HRA, we ran a multivariate binary logistic regression, examining the association of the subjective and objective potential barriers with non-participation in the HRA (Table 2, regression A1, non-participation = 1, participation = 0). All variables were entered in one block. Age was entered as a continuous variable, and the other variables were entered as dummy variables with one category left out of the regression as a reference point. Results are expressed as odds ratios (ORs) together with their 95% confidence intervals (CIs).

In order to find out which objective and subjective barriers are associated with non-participation in the workshops, we carried out a similar procedure (comparing characteristics of participants vs. non-participants and conducting a multivariate binary logistic regression) for the subsample of employees ($N = 1611$) who had participated in the HRA and were

² This single-item measure draws on the Perceived Organizational Support (POS) construct. POS scales capture employees' beliefs that the organization has a general positive orientation toward employees' contribution and well being. Although the original Survey of Perceived Organizational support (SPOS) consists of 36 items, the use of shorter versions is common (for a review, see Rhoades & Eisenberger, 2002). Furthermore, we distributed this question along with a standard POS measure among 450 employees, and conducted a CFA. The single item loaded on the POS scale (.47) and one factor only was revealed. Results can be obtained from the authors upon request.

therefore eligible to proceed to the next step in the WHP program, and choose whether to participate in the workshops (see Table 1 right column and Table 2 regression A2).

The last step included an analysis of the frequencies of self-reported explicit barriers to participation in the HRA and in the workshops and the degree to which these explicit barriers are associated with potential objective and subjective barriers. We therefore ran multivariate binary logistic regressions for each implicit barrier (reporting this barrier = 1; not reporting = 0), with all implicit barriers entered in one block as predictors, in order to account for confounding effects. Age was entered as a continuous variable, and the other variables were entered as dummy variables with one category left out of the regression as a reference point (see Tables 3 and 4).

Results

The final sample included 65.4% women and 75% employees aged 30–59, and positions ranged from blue-collar (4%) to faculty (23%). Among respondents, 60.4% perceived their organization as very committed to employees' health, 45% perceived their health to be very good or excellent, and 48.7% reported that it is very important for them to make a lifestyle change.

Barriers to Participation in the HRA

Of the employees who responded to the survey, 39.7% reported that they had not completed the HRA. The frequencies of the objective and subjective barriers to participation in the HRA are presented in Table 1(left column). Higher rates of non-participation were found among older employees, among employees in academic or blue-collar positions, and among employees who perceived the organization as not committed to employees' health. In order to test the study's hypotheses and assess the unique and unconfounded role of each objective and subjective barrier in the prediction of non-participation in the HRA, we ran an ordinal logistic regression (see Table 2). Regression A1 presents the ORs for non-

participation in the HRA. We report the increased odds of *non-participation*, using the '1/Odds Ratio' formula, wherever a significant OR < 1.0 was obtained (Field, 2009). In concurrence with our hypotheses, age, gender, position at work, self-rated health and perceived organizational commitment were all associated with non-participation in the HRA.

Insert Table 1 here

Objective barriers to participation in the HRA. Older employees were 1.33 times more likely than younger employees to be non-participants (thus supporting hypothesis 1). Men were 1.62 times more likely than women to be non-participants (thus supporting hypothesis 2). Employees in blue-collar positions were 2.08 (OR= .48) and 1.85 (OR=.54) times more likely to be non-participants in the HRA compared with employees in professional and administrative positions, respectively, but were equally likely compared to employees holding academic and management positions to be non-participants (thus partially supporting hypothesis 3).

Subjective barriers to participation in the HRA. Employees who self-rated their health as good and those who rated it as poor/fair were, respectively, 1.58 and 1.71 times more likely to be non-participants compared with employees who rated their health as very good/excellent (thus supporting hypothesis 4). We assumed that lower levels of importance of making a lifestyle change would be associated with non-participation mainly in the workshop (hypothesis 5), and indeed we observed no association between this factor and non-participation in the HRA. Last, employees who perceived their organization to be somewhat or not at all committed to employee health were 1.68 and 3.39 times more likely (respectively) to be non-participants in the HRA, compared with employees who perceived their organization to be very committed to their health (thus supporting hypothesis 6).

Insert Table 2 here

Explicit barriers to participation in the HRA. Table 3 presents the frequencies of five barriers to participation in the HRA as reported by the 765 employees who did not complete the HRA. Three hundred eighteen employees (41.5%, regression B1) reported that they had not heard about the HRA. The odds of reporting this barrier were 1.42 times higher among men than among women, and 1.17 times higher among younger employees than among older employees. The remaining 447 employees who had heard about the HRA but chose not to participate reported the following barriers: 10.3% perceived the HRA to be of low value for them (regression B2); 51.4 % reported that they had not had the time to complete the HRA (regression B3); 16.3% had technical problems (regression B4); and 17% were worried about their confidentiality (regression B5). Among non-participants in the HRA, we observed different associations between some of the objective and subjective barriers: Older employees were 1.34 times more likely than younger employees to be worried about confidentiality; men were 3.05 times more likely than women to perceive the HRA as having low value for them; employees who perceived the organization as not committed to their health were 2.90 times more likely to report low value, and 3.13 times more likely to be worried about confidentiality, compared with employees who perceived the organization as committed to their health. Finally, employees with low perceived importance of making a lifestyle change were 2.88 times more likely than other non-participants to report that the HRA was not valuable to them.

Insert Table 3 here

Barriers to Participation in the Workshop

We analyzed the data of all respondents who completed the HRA ($N = 1161$) and therefore were eligible to participate in the workshop (See Table 1, right column). Within this sub-sample, 647 employees (55.7%) reported that they had not participated in the workshop. We observed higher rates of non-participation among the following employees: younger employees, men, employees in academic or blue-collar positions, employees with poor/fair health, and employees who perceived the organization as not committed to employees' health. In order to test the study's hypotheses and assess the unique and unconfounded role of each objective or subjective barrier in the prediction of non-participation in the workshop, we ran a logistic regression (See Table 2). Regression A2 presents the ORs for non-participation in the workshop. We report increased odds of *non-participation*, using the '1/Odds Ratio' formula, wherever a significant $OR < 1.0$ was obtained (Field, 2009). In concurrence with our hypotheses, age, gender, position at work, self-rated health and importance of making a lifestyle change were all associated with non-participation in the workshop, whereas in contrast with our hypotheses, perceived organizational commitment to employees' health was not.

Objective barriers to participation in the workshop. As appears in regression A2 (table 2), younger employees were 1.19 (OR 0.84) times more likely than older employees to be non-participants (thus supporting hypothesis 1). Men were 2.61 times more likely than women to be non-participants (thus supporting hypothesis 2). Employees in blue-collar positions were 4 times (OR= .25) more likely to be non-participants in the workshop compared with employees in professional and in management positions, but were not more likely to be non-participants in comparison with employees holding academic or administrative positions (thus partially supporting hypothesis 3).

Subjective barriers to participation in the workshop. Employees with poor/fair self-rated health were 2.25 times more likely to be non-participants compared with employees who rated their health as good, very good or excellent (thus supporting hypothesis 4). In addition, employees who reported that it was not at all important for them to make a lifestyle change were 1.96 times more likely to be non-participants compared with employees who reported that it was somewhat or very important to make a lifestyle change (thus supporting hypothesis 5). Finally, our sixth hypothesis was not supported in this subsample, as perceived organizational commitment to employees' health was not associated with non-participation in the workshop.

Explicit barriers to participation in the workshop. Table 4 presents the frequencies and predictors of the four different barriers to participation, as reported by the 647 employees who completed the HRA but chose not to participate in the workshops. The leading barriers were inconvenient time or location of the workshops (56%, regression C2), low value of the workshops (28%, regression C1), and technical problems with the registration process (10%, regression C3). Forty-four additional employees (7%, regression C4) reported that they exercise on their own and therefore do not need the activities offered by the WHP program. Again, we observed different associations between subjective and objective barriers. We found that men tended to focus on the value of the program while women focused on time, location and technical constraints: Men were 1.80 times more likely than women to report that the value of the workshop is low, while women were 1.64 times more likely (OR = .61) than men to report time and location barriers, and 2.38 times more likely (OR=.42) to report technical barriers to participation in the workshops. We also found that employees in blue-collar positions were 2.70 times (OR=.37) more likely to report time and location barriers, compared with employees in academic positions. Looking at employees' health related perceptions, we found that the lower employees rated their health, or the more important it

was for them to make a lifestyle change, the more likely they were to report that time and location barriers prevented them from participating. At the same time, employees with good health and employees for whom it was not important to make a lifestyle change were more likely to report that the workshop was not valuable enough.

Insert Table 4 here

Discussion

To the best of our knowledge, this is the first study to examine non-participation in two distinct phases of a WHP program, using a random sample of employees that includes both participants and non-participants. Although the results indicate that employee characteristics (such as age and gender), type of job, and employee perceptions of their health and their organization are all associated with non-participation, the magnitude and nature of these associations differ across the two phases of the WHP program. In addition, the reasons employees gave for their non-participation differed across the phases of the program and across sub-groups of employees defined by the characteristics listed above.

Non-participation in the HRA

Older employees, male employees, blue collar employees, faculty and academic researchers, employees who report being in poorer health, and employees who perceive their organization not to be strongly committed to their health were more likely not to participate in the first step of the WHP—the completion of the HRA.

More than 40% of the non-participants in the HRA claimed that they did not know about it. Given the herculean efforts of the program staff to market the program through e-mail, university-wide events and signage throughout campus, this percentage seems surprisingly high. However, it should be noted that younger, male, blue-collar and

employees who do not perceive the organization to be committed to their health were the most likely to report that they did not know about the opportunity to participate. Thus, one possible explanation is that the channels of communication or the campaign messages were too general or were not targeted at these segments of the employee population. Posting personalized messages in employee mailboxes or posting signs tailored to specific employee groups might have created greater awareness.

Among those who knew about the HRA but still chose not to complete it, a lack of time was the reason given most often, across all of the employee sub-groups defined by our study variables. The reasons for experiencing a lack of time likely vary among individual employees and across employee groups. For example, some workers may have little flexibility in their work schedules, some may be burdened by heavy workloads, and others may be experiencing the demands of multiple jobs and/or multiple roles (e.g., employee, parent, caregiver for frail family member). Allowing and encouraging all employees to use designated work time to complete this finite first step of the WHP program (and providing technical support for those who need it) might be the best strategy for encouraging participation among all employees.

Older employees were more likely to report confidentiality concerns as a barrier to participation. Older employees may be less comfortable with the security of the internet, and thus more concerned about entering personal information on a website (Campbell, 1997; Milne, Beckman & Taubman, 1996, Paine, 2007). In addition, since chronic diseases are more prevalent among older adults (Mokdad, Marks, Stroup & Gerberding, 2004) and employees may be concerned about sharing information about existing health conditions with their employers (Munir, Leka & Griffiths, 2005), older employees may be more fearful of sharing their health information.

Those employees who were more skeptical of the organization's commitment to their health and well-being were more likely to voice confidentiality concerns and to report that the HRA was not likely to have value to them. These findings may reflect a cynical, suspicious view that poses as a barrier to participation in any program sponsored by the employing organization, such as employee assistance programs (Bamberger, 2009). These employees may not perceive the organization nor the program as a legitimate source of help (Nedler, 1991) and thus refrain from participating. Involving employees in the development and implementation of the WHP program may aid in decreasing suspicion and cynicism about the employer's motives (Taitel et al. 2008, Wanous, Reichers, & Austin, 2000).

Non-participation in the WHP workshop

Those who completed the HRA were eligible to participate in the workshop that addressed how employees could use their HRA results to inform a personalized action plan for health promotion. The profile of employees who chose not to participate in the workshop differs somewhat from that of those who did not participate in the HRA. Younger, male and blue collar workers were less likely to participate. The reasons for non-participation seemed to belong to one of two categories: the workshop was not easily accessible (time, location or technical barriers) or the workshop was not perceived as useful (low value or exercise on my own).

Those employees who reported being in poorer health were less likely to report that the workshop was of little value, but were more likely to report that it was difficult to access. Non accessibility may reflect employees' inability to control their work schedule or workload and has been found in previous studies to be associated with increased health care costs (e.g., Ganster, Fox & Dwyer, 2001).

Increasing access for these employees (e.g., having a designated health educator available at scheduled times in the workplaces that have a concentration of employees in poorer health)

might be beneficial for engaging these high risk employees. For those employees who perceived little value in the workshop, it may be because they consider themselves to be well-informed about behavioral risk factors and/or already successful in incorporating health promoting behaviors into their lifestyles. For such employees, it may be beneficial to provide the opportunity to participate in subsequent phases of the program (e.g. physical activity classes) without having to attend the workshop.

It is interesting to note that employees' perceptions of the organization's commitment to employee health were not associated with non-participation in the workshop. Perhaps once employees have overcome their doubts about the organization's motives in providing the WHP program and choose to participate in the first phase of the program, these doubts no longer play a role. Thus, making the first stage easy to accomplish and tied to external rewards may increase employees' openness toward this new organizational initiative (Wanberg & Banas, 2000), and serve as "foot in the door" strategies (Cialdini, 2008) that ultimately increase participation in subsequent stages of the program.

Implications for theory

Although the current study was exploratory in nature and did not utilize a specific theoretical model, our findings suggest the potential relevance of two leading theories in the field of organizational behavior. First, the fit between a person and his or her organizational environment (P-E fit) has served, for decades, as a major framework for understanding employee behavior (for a review, see Edwards, 2008). An employee's decision to not participate in a WHP program can be viewed as the result of a lack of fit between an employee's needs and preferences on the one hand, and the resources offered by the organization on the other. Furthermore, the nature of the lack of fit might be illuminated through the application of the Conservation of Resources (COR) theory developed by Hobfoll (2001).

According to COR, individuals strive to obtain, retain, protect and foster the things that they value. These valued entities are termed resources and include one's health (Hobfoll & Shirom, 2000). COR emphasizes the importance of resource investment in order to protect against resource loss. In order to protect one's health, a person has to invest other resources such as time, money and energy. Although COR theory has been proposed and tested predominantly as a theory of stress and health, the findings of the present study suggest that COR theory may be relevant to the decision to participate in WHP programs (see Figure 1). More specifically, employees with poorer health status will strive to obtain better health by utilizing the WHP program only if they (a) have enough resources (such as time, access and necessary skills) to invest in the first place and (b) believe that participation in the WHP program will lead to resource gain (e.g., improve their health) and not to resource loss (e.g., confidentiality breaches). These criteria are consistent with the barriers to participation found in this study.

Insert Figure 1 here

Strengths and limitations

As mentioned previously, this is the first study to utilize a large random sample of employees to investigate non-participation in a WHP program, incorporating both self-reported barriers to participation and empirically-derived barriers identified through analysis of the associations of employee characteristics with participation. The uniqueness of our sample stems in part from the fact that 765 employees who chose not to complete a 10-minute long on-line HRA survey (thus passing up a \$150 incentive) did complete our survey (thus earning the chance for a \$5 gift card for a fruit smoothie). This is further evidence that

barriers other than time constraints and limited channels of communication are influencing employees' decisions not to participate in the WHP program.

However, this study does have its limitations. First, the survey data was collected after employees had decided whether or not to participate. Therefore, it is possible that non-participation in the WHP program affected respondents' reports of their subjective potential barriers, including their self-reported health. However, previous studies (see e.g., Singh-Manoux et al., 2006) have found that self-reported health is determined mainly by symptoms and not by health behaviors (i.e., participation in a WHP program). Nevertheless, the strongest study would include a true longitudinal design with a pre-program survey to assess potential barriers, rigorous assessment of participation in various components of the program, and then a post-program survey to assess self-reported reasons for participating or not participating. Second, due to the anonymity of the survey, we were not able to validate employees' self-reported participation in the program. Still, by comparing aggregated employee responses with official data from the program office, we were able to demonstrate that our sample's responses were quite similar to the overall participation rates calculated from organizational records. Third, due to constraints on the length of the survey, we were not able to use previously validated measures such as the multi-item perceived organizational support scale (Eisenberger, Huntington, Hutchison, & Sowa, 1986). Nor were we able to include additional potential barriers for analysis.

Conclusion

In spite of these limitations and consistent with previous research, this study strongly supports the strategy of tailoring WHP programs for specific employee groups (Robroek et al., 2009). Furthermore, incorporating both self-reported and empirically-derived barriers to participation into our analysis allowed us to identify sub-groups of employees most at risk for non-participation and to explore employees' decision processes with regard to participation.

Employees may be trying to optimize their resources by avoiding resource loss and investing strategically to experience resource gain. Both WHP practitioners and researchers may benefit from considering this COR framework as they explore ways of increasing participation in WHP among all employees.

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Table 1
Sample Characteristics and Non-Parametric Tests Comparing the Frequencies of Participation and Non-Participation in Each Sub-Category of the Objective and Subjective Potential Barriers.

	Step 1: HRA (n=1926)				Step 2: Workshops (n = 1161)			
	n	Participants (n=1161)	Non participants (n=765)	Chi-sq (df)	n	Participants (n=514)	Non- participants (n=647)	χ^2 (df)
Age Categories								
20-29	222	74.8%	25.2%	47.3 (4)**	166	38.0%	62.0%	16.5(4)**
30-39	471	66.5%	33.5%		313	40.9%	59.1%	
40-49	505	59.8%	40.2%		302	40.7%	59.3%	
50-59	494	53.0%	47.0%		262	52.3%	47.7%	
60+	234	50.4%	49.6%		118	53.4%	46.6%	
Gender								
Women	1260	66.2%	33.8%	53.2(1)**	834	51.2%	48.8%	57.6(1)**
Men	666	49.1%	50.9%		327	26.6%	73.4%	
Position								
Faculty / Academic	457	44.2%	55.8%	88.1(4)**	202	32.2%	67.8%	28.6(4)**
Management	222	59.9%	40.1%		133	50.4%	49.6%	
Professional	644	67.9%	32.1%		437	48.5%	51.5%	
Administrative	532	67.7%	32.3%		360	46.1%	53.9%	
Blue collar	71	40.8%	59.2%		29	13.8%	86.2%	
Self rated health								
Poor / Fair	281	55.9%	44.1%	14.5(2)**	157	32.5%	67.5%	10.8(2)**
Good	762	56.6%	43.4%		431	44.8%	55.2%	
Very good / Excellent	883	64.9%	35.1%		573	47.1%	52.8%	
Lifestyle change								
Not at all / A little	346	53.5%	46.5%	8.3(2)*	185	30.3%	69.7%	21.2(2)**
Somewhat	642	62.3%	37.7%		400	43.3%	56.8%	
Very	938	61.4%	38.6%		576	49.5%	50.5%	
Organizational commitment								
Not at all / A little committed	157	35.0%	75.0%	84.9(2)**	55	32.7%	67.3%	9.7(2)**
Somewhat	605	52.4%	47.6%		317	38.8%	61.2%	
Very	1164	67.8%	32.2%		789	47.3%	52.7%	

Note: Lifestyle change= Importance of making a lifestyle change; Organizational commitment = Organizational commitment to employees' health.

* p < .05, ** p<.01

Table 2

Odds for Non-Participation in the HRA (A1) and in the Workshops (A2) According to Employees' Objective and Subjective Potential Barriers, Using Multivariate Binary Logistic Regression Analysis.

Variables	(A1) HRA Non participation (n=1926)		(A2) Workshop Non participation (n=1161)	
	OR	95% CI	OR	95% CI
Age	1.33**	[1.23, 1.45]	0.84**	[0.76, 0.93]
Gender				
Women	1.00		1.00	
Men	1.62**	[1.30, 2.01]	2.61**	[1.93, 3.53]
Position				
Blue collar	1.00		1.00	
Academic	1.18	[0.69, 2.02]	0.49	[0.16, 1.52]
Management	0.62	[0.35, 1.10]	0.25*	[0.08, 0.78]
Professional	0.48**	[0.28, 0.82]	0.25*	[0.08, 0.77]
Administrative	0.54*	[0.31, 0.94]	0.33	[0.11, 1.02]
Self rated health				
Very good / Excellent	1.00		1.00	
Good	1.58**	[1.27, 1.96]	1.21	[0.93, 1.59]
Poor / Fair	1.71**	[1.27, 2.30]	2.25**	[1.52, 3.34]
Lifestyle change:				
Very	1.00		1.00	
Somewhat	0.96	[0.77, 1.20]	1.20	[0.91, 1.57]
Not at all / A little	1.12	[0.85, 1.48]	1.96**	[1.33, 2.87]
Organizational commitment				
Very	1.00		1.00	
Somewhat	1.68**	[1.36, 2.08]	1.18	[0.89, 1.57]
Not at all / A little	3.39**	[2.34, 4.91]	1.50	[0.82, 2.76]
Tests	R ² = .12 (Cox & Snell) R ² = .16 (Nagelkerke) Model $\chi^2(12)=239.88**$		R ² = .10 (Cox & Snell) R ² = .14 (Nagelkerke), Model $\chi^2(9)=124.56**$	

Note: OR = odds ratio; CI = confidence interval. Odds ratios were adjusted by logistic regression for all other variables in the table. Lifestyle change= Importance of making a lifestyle change; Organizational commitment = Organizational commitment to employees' health.

* p < .05, ** p < .01

Table 3

Odds for Reporting Explicit Barriers to Participation in the HRA (Regressions B 1-5), by Employees' Objective And Subjective Potential Barriers, Using Multivariate Binary Logistic Regression Analysis, n=765.

	Not knowing (n=318)		Other Barriers to participation in the HRA (n= 447, a subsample of employees who knew about the HRA)							
	(Regression B1) Didn't know n=318 (41.5%)		(Regression B2) Low Value n=46 (10.3%)		(Regression B3) Time n=230 (51.4%)		(Regression B4) Technical n=73 (16.3%)		(Regression B5) Confidentiality n=76 (17%)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age	0.85*	[0.75, 0.97]	1.11	[0.83, 1.50]	0.86	[0.73,1.03]	1.04	[0.82, 1.30]	1.34*	[1.05, 1.71]
Gender										
Women	1.00		1.00		1.00		1.00		1.00	
Men	1.42*	[1.03, 1.96]	3.05**	[1.51, 6.13]	0.97	[0.63, 1.49]	0.68	[0.37, 1.25]	0.65	[0.36, 1.18]
Position										
Blue collar	1.00		1.00		1.00		1.00		1.00	
Academic	0.75	[0.38, 1.49]	4.05	[0.45, 36.65]	2.51	[0.80, 7.84]	0.45	[0.12, 1.67]	0.55	[0.14, 2.13]
Management	0.42*	[0.19, 0.92]	3.01	[0.27, 33.10]	1.59	[0.47, 5.39]	0.23	[0.05, 1.05]	0.66	[0.15, 2.88]
Professional	0.39*	[0.19, 0.80]	6.17	[0.68, 55.94]	1.36	[0.43, 4.23]	0.32	[0.08, 1.20]	0.66	[0.17, 2.59]
Administrative	0.37*	[0.17, 0.77]	3.76	[0.37, 38.21]	1.41	[0.43, 4.58]	0.58	[0.15, 2.27]	0.59	[0.14, 2.46]
Self rated health										
Very good / Excellent	1.00		1.00		1.00		1.00		1.00	
Good	0.94	[0.67, 1.31]	0.78	[0.39, 1.56]	1.75*	[1.14, 2.67]	0.73	[0.41, 1.31]	.84	[0.49, 1.46]
Poor / Fair	1.12	[0.72, 1.75]	0.36	[0.10, 1.30]	1.47	[0.82, 2.64]	1.42	[0.69, 2.92]	.56	[0.23, 1.39]
Lifestyle change:										
Very	1.00		1.00		1.00		1.00		1.00	
Somewhat	0.93	[0.66, 1.31]	1.17	[0.51, 2.67]	1.32	[0.85, 2.05]	0.74	[0.41, 1.34]	1.54	[0.85, 2.80]
Not at all / A little	0.88	[0.59, 1.32]	2.88**	[1.32, 6.25]	0.66	[0.39, 1.12]	0.78	[0.38, 1.58]	1.85	[0.95, 3.61]
Organizational commitment										
Very	1.00		1.00		1.00		1.00		1.00	
Somewhat	1.39	[1.00, 1.93]	1.27	[0.61, 2.65]	0.90	[0.59, 1.37]	0.97	[0.55, 1.72]	1.90*	[1.07, 3.37]
Not at all / A little	1.91*	[1.20, 3.03]	2.90*	[1.17, 7.17]	0.51	[0.26, 1.00]	1.10	[0.47, 2.60]	3.13**	[1.47, 6.69]
Tests										
R ² (Cox & Snell)		0.07		0.08		0.06		0.03		0.06

R ² (Nagelkerke)	0.09	0.16	0.06	0.05	0.10
Model χ^2 (df)	54.65 (12) **	36.95 (12) **	27.6 (12) **	14.6 (12)	26.5 (12)**

Note: O.R. = odds ratio; CI = confidence interval. Odds ratios were adjusted by logistic regression for all other variables in the table.

Reasons for non-participation: (C) Didn't know: 'I didn't know about the HRA survey', (D) Low value: 'I did not believe it would improve my health', 'I did not think \$150 was worth the effort', (E) Time: 'I did not have time to complete the HRA', (F) Technical problems: 'I could not find the survey', 'I thought it was too complicated', (G) Confidentiality: 'I did not want to give any personal information'.

* p < .05, ** p < .01

Table 4

Odds for Reporting Explicit Barriers to Participation in the Workshops (Regressions C 1-4), by Employees' Objective and Subjective Implicit Barriers, Using Multivariate Binary Logistic Regression Analysis.

	Barriers to participation in the workshop (n=647)							
	(Regression C1) Low Value N=183 (28%)		(Regression C2) Time & Location N=364 (56%)		(Regression C3) Technical N=67 (10%)		(Regression C4) Exercise at home N=44 (7%)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age	.89	[0.76, 1.04]	.93	[0.81, 1.07]	1.04	[0.84, 1.30]	.82	[0.62, 1.08]
Gender								
Women	1.00		1.00		1.00		1.00	
Men	1.80**	[1.22, 2.65]	.61**	[0.43, 0.88]	.42**	[0.21, 0.81]	1.27	[0.66, 2.47]
Position								
Blue collar	1.00		1.00		1.00		1.00	
Academic	1.34	[0.47, 3.86]	.37*	[0.14, 0.99]	1.24	[0.25, 6.07]	2.36	[0.28, 19.8]
Management	1.20	[0.39, 3.75]	.44	[0.15, 1.25]	.73	[0.13, 4.11]	1.77	[0.18, 17.4]
Professional	1.36	[0.49, 3.78]	.51	[0.20, 1.31]	.48	[0.10, 2.36]	1.91	[0.23, 15.5]
Administrative	1.14	[0.40, 3.31]	.40	[0.15, 1.07]	1.03	[0.21, 4.95]	1.26	[0.14, 11.1]
Self rated health								
Very good / Excellent	1.00		1.00		1.00		1.00	
Good	.56**	[0.38, 0.84]	1.63**	[1.13, 2.34]	1.18	[0.65, 2.13]	.50	[0.25, 1.02]
Poor / Fair	.28**	[0.14, 0.54]	1.82*	[1.12, 2.97]	1.47	[0.71, 3.05]	.29*	[0.08, 0.99]
Importance of lifestyle change:								
Very	1.00		1.00		1.00		1.00	
Somewhat	1.59*	[1.03, 2.45]	.92	[0.63, 1.33]	.93	[0.52, 1.69]	.76	[0.37, 1.58]
Not at all / A little	3.14**	[1.93, 5.11]	.42**	[0.27, 0.67]	1.29	[0.62, 2.67]	.67	[0.29, 1.57]
Organizational commitment								
Very	1.00		1.00		1.00		1.00	
Somewhat	1.29	[0.86, 1.92]	.94	[0.66, 1.36]	1.03	[0.57, 1.85]	1.60	[0.81, 3.14]
Not at all / A little	2.02	[0.97, 4.23]	.57	[0.28, 1.17]	1.52	[0.55, 4.24]	1.90	[0.60, 5.99]
Tests								
R ² (Cox & Snell)	.12		.08		.03		.02	

R ² (Nagelkerke)	.18	.10	.06	.06
Model χ^2 (df)	84.4(12) **	57.2(12) **	19.7(12) *	5.7(12)

Note: OR, odds ratio; CI, confidence interval. Odds ratios were adjusted by logistic regression for all other variables in the table.

Reasons for non-participation: (H) Low Value: 'I did not think it was worth the effort', 'I did not think I would benefit from the workshop', (I) Time & location: 'I did not like the scheduled times', 'I did not like the location', 'I could not attend them while at work', (J) Technical: 'I did not know how to register', 'I had trouble registering',

(K) Exercise at home: I train at home.

* p < .05, ** p < .01

Figure 1:

Conceptual Framework for Employee Decision-Making about WHP Participation

