Perform a mammography: Motives' inventory

Mathilde Lochmann, Myriam Guedj, Maria Teresa Muñoz Sastre, Etienne Mullet

European Review of Applied Psychology

Perform a mammography: Motives' inventory

--Manuscript Draft--

Manuscript Number:	ERAPSY-D-23-00017
Full Title:	Perform a mammography: Motives' inventory
Secondary Full Title:	Réaliser une mammographie: Inventaire des motifs
Article Type:	Original article

Corresponding Author:	Myriam GUEDJ, Maitre de conférences TOULOUSE, FRANCE
First Author:	Mathilde Lochmann
Order of Authors:	Mathilde Lochmann
	Myriam GUEDJ, Maitre de conférences
	María Teresa MUÑOZ SASTRE
	Etienne Mullet

Abstract:	Introduction: This study examines the motives of women for agreeing or refusing to have a mammogram. Method: Three hundred and ten participants were recruited. Two questionnaires listing the motives for undergoing or refusing to undergo a mammogram were developed. Intolerance of uncertainty, worry, anxiety, personality were respectively rated by: EII, QIPS, GAD-7, BHI-24. Result: Seven facilitators were interpreted within the framework of Reversal Theory: Interest of early diagnosis, Quality of care, Habit, Collectivist perspective, Following the doctor's advice, Cancer(s) in entourage, Hypochondriac beliefs. Six barriers were revealed: Absence of cancer in entourage, Anxiety, Physical and moral pain, Lack of information, Spatiotemporal difficulties, Aspiration for freedom. The frequency of mammography was positively linked to the age, number of children, Habit, and negatively to Physical and moral pain, Lack of information and Spatiotemporal difficulties. Age and Habit had a positive effect on the frequency of screening while the Spatiotemporal difficulties had a negative effect. Conclusion: This study provides a better understanding of the motives that lead women to accept or refuse performing this examination. It could be useful to the medical profession and more broadly to the field of public health.
Secondary Abstract:	Introduction : Cette étude examine les motifs des femmes à accepter ou refuser la réalisation d'une mammographie. Elle investigue également les liens entre les facteurs motivationnels, l'âge, le nombre d'enfant(s), l'intolérance à l'incertitude, l'inquiétude, l'anxiété, la personnalité et la fréquence de réalisation des mammographies. Méthode : Trois-cent-dix participantes ont été recrutées. Deux questionnaires répertoriant les motifs à accepter et à refuser la réalisation d'une mammographie ont été élaborés grâce aux données de la littérature et à des entretiens semi-directifs. L'intolérance à l'incertitude, l'inquiétude, l'anxiété et la personnalité ont été respectivement évaluées par l'EII, le QIPS, le GAD-7 et le BHI-24. L'âge, le nombre d'enfant(s) ainsi que la fréquence de réalisation des mammographies ont également été renseignés. Résultat : Sept facteurs motivationnels facilitateurs ont été mis en lumière et interprétés au regard de la Théorie du Renversement : « Intérêt du diagnostic précoce », « Qualité de la prise en charge », « Habituation », « Perspective collectiviste », « Suivre l'avis du médecin », « Cancer(s) dans l'entourage », « Croyances hypocondriaques ». Six facteurs motivationnels barrières ont également été révélés : « Absence de cancer dans l'entourage », « Angoisses », « Douleur physique et morale », « Difficultés spatio-temporelles », « Manque d'informations », « Aspiration à la liberté ». La fréquence de réalisation des mammographies est associée positivement à l'âge, au nombre d'enfant(s), au facteur motivationnel « Habituation » et négativement aux facteurs motivationnels « Difficultés spatio-temporelles », « Douleur physique et morale » et « Manque d'informations ». L'âge et le facteur « Habituation » avaient un effet prédicteur positif sur la fréquence mammographique tandis que le facteur « Difficultés spatio-temporelles » avait un effet prédicteur négatif.

	Conclusion : Cette étude offre une meilleure compréhension des motifs qui poussent les femmes à accepter ou à refuser la réalisation de cet examen. Elle peut être utile à la profession médicale et plus largement au champ de la santé publique.
Keywords:	Mammography; Breast cancer; Motive; Reversal theory
Secondary Keywords:	Mammographie; Cancer du sein; Motif; Théorie du renversement
Suggested Reviewers:	Felix NETO Full Professor, University of Porto fneto@fpce.up.pt He knows a lot about reversal Theory.
	Patricia Rulence Paques lecturer, University of Lille patricia.rulencepaques@gmail.com She knows a lot about the reversal theory
	Germano Vera Cruz Full Professor, University of Picardy Jules Verne germano.vera.cruz@u-picardie.fr He works a lot on health psychology.
	Nathalie lionet-przygodzki@univ-lille.fr Full Professor, University of Lille nathalie.lionet-przygodzki@univ-lille.fr
	Marie Préau Full Professor, University of Lyon marie.preau@univ-lyon2.fr She works on health psychology
Opposed Reviewers:	

Réaliser une mammographie : Inventaire des motifs.

Perform a mammography: Motives' inventory.

LOCHMANN Mathilde, PhD in health psychology.

Laboratoire CERPPS (Centre d'Études et de Recherches en Psychopathologie et Psychologie de la Santé)

Université de Toulouse, UT2J, France

5, Allées Antonio-Machado, F-31058 Toulouse Cedex 9, France

ORCID : https://orcid.org/0000-0002-5722-1555

mathilde.lochmann@univ-tlse2.fr

GUEDJ Myriam*, lecturer in health psychology

Laboratoire CERPPS (Centre d'Études et de Recherches en Psychopathologie et Psychologie de la Santé)

Université de Toulouse, UT2J, France

5, Allées Antonio-Machado, F-31058 Toulouse Cedex 9, France

ORCID : http://orcid.org/0000-0002-8855-1266

myriam.guedj@univ-tlse2.fr

MUÑOZ SASTRE María Teresa, professor in health psychology

Laboratoire CERPPS (Centre d'Études et de Recherches en Psychopathologie et Psychologie de la Santé)

Université de Toulouse, UT2J, France

5, Allées Antonio-Machado, F-31058 Toulouse Cedex 9, France

mtmunoz@univ-tlse2.fr

MULLET Étienne, director of study

École Pratique des Hautes Études (EPHE)

Les Patios Saint-Jacques,

4-14 rue Ferrus, 75014 Paris, France

ORCID : https://orcid.org/0000-0002-1707-3914

etienne.mullet@wanadoo.fr

E-mail et phone of correspondant author* : myriam.guedj@univ-tlse2.fr, 05.61.50.41.64

To undergo a mammography : an inventory of motives.

This study examines the motives of women for agreeing or refusing to have a mammogram. Three hundred and ten participants were recruited. Two questionnaires listing the motives for undergoing or refusing to undergo a mammogram were developed. Intolerance of uncertainty, worry, anxiety, personality were respectively rated by: EII, QIPS, GAD-7, BHI-24. Seven facilitators were interpreted within the framework of Reversal Theory: “Interest of early diagnosis”, “Quality of care”, “Habit”, “Collectivist perspective”, “Following the doctor's advice”, “Cancer(s) in entourage”, “Hypochondriac beliefs”. Six barriers were revealed: “Absence of cancer in entourage”, “Anxiety”, “Physical and moral pain”, “Lack of information”, “Spatiotemporal difficulties”, “Aspiration for freedom”. The frequency of mammography was positively linked to the age, number of children, “Habit”, and negatively to “Physical and moral pain”, “Lack of information” and “Spatiotemporal difficulties”. Age and “Habit” had a positive effect on the frequency of screening while the “Spatiotemporal difficulties” had a negative effect.

Keywords: Mammography; Breast cancer; Motive; Reversal theory

Résumé :

Introduction : Cette étude examine les motifs des femmes à accepter ou refuser la réalisation d’une mammographie. Elle investigue également les liens entre les facteurs motivationnels, l’âge, le nombre d’enfant(s), l’intolérance à l’incertitude, l’inquiétude, l’anxiété, la personnalité et la fréquence de réalisation des mammographies.

Méthode : Trois-cent-dix participantes ont été recrutées. Deux questionnaires répertoriant les motifs à accepter et à refuser la réalisation d’une mammographie ont été élaborés grâce aux données de la littérature et à des entretiens semi-directifs. L’intolérance à l’incertitude, l’inquiétude, l’anxiété et la personnalité ont été respectivement évaluées par l’EII, le QIPS, le GAD-7 et le BHI-24. L’âge, le nombre d’enfant(s) ainsi que la fréquence de réalisation des mammographies ont également été renseignés.

Résultat : Sept facteurs motivationnels facilitateurs ont été mis en lumière et interprétés au regard de la Théorie du Renversement : « Intérêt du diagnostic précoce », « Qualité de la prise en charge », « Habituation », « Perspective collectiviste », « Suivre l’avis du médecin », «

Cancer(s) dans l'entourage », « Croyances hypocondriaques ». Six facteurs motivationnels barrières ont également été révélés : « Absence de cancer dans l'entourage », « Angoisses », « Douleur physique et morale », « Difficultés spatio-temporelles », « Manque d'informations », « Aspiration à la liberté ». La fréquence de réalisation des mammographies est associée positivement à l'âge, au nombre d'enfant(s), au facteur motivationnel « Habituation » et négativement aux facteurs motivationnels « Difficultés spatio-temporelles », « Douleur physique et morale » et « Manque d'informations ». L'âge et le facteur « Habituation » avaient un effet prédicteur positif sur la fréquence mammographique tandis que le facteur « Difficultés spatio-temporelles » avait un effet prédicteur négatif.

Conclusion : Cette étude offre une meilleure compréhension des motifs qui poussent les femmes à accepter ou à refuser la réalisation de cet examen. Elle peut être utile à la profession médicale et plus largement au champ de la santé publique.

Mots clés : Mammographie; Cancer du sein; Motif; Théorie du renversement

Introduction

In France, Europe and the United States, breast cancer is the most common cancer in women. It is also the one with the highest mortality rate (17.9% of female cancer deaths in France) (Jehannin Ligier et al., 2017). The Organized Screening (OS) program for breast cancer became widespread in France in 2004 with the following objectives: (a) lowering the specific mortality rate for breast cancer, (b) reducing the recourse to mastectomy, and (c) decreasing the incidence of late-stage breast cancer (Lousdal et al., 2016). Mammography screening is secondary prevention: it aims to intervene early in order to improve the progression of breast cancer. Since the work of Halsted, it has often been accepted that the smaller and the earlier this cancer is treated, the more curable it is. According to the National Cancer Institute (INCa, 2013), OS has made it possible to reduce specific mortality from breast cancer by 15 to 21% worldwide.

The question of breast cancer screening by mammography is nevertheless controversial. The main criticisms targeting OS are the following: (a) the incidence of breast cancer has increased since its introduction, (b) the phenomenon of overdiagnosis is considered to be underestimated by some, (c) stabilization (not a decrease) of the advanced stages has been observed and finally, (d) the regions where screening is the most intense are not associated with a low mortality rate specific to breast cancer (Autier and Boniol, 2018). Other negative repercussions linked to the examination are reported such as (e) irradiation (Yaffe and Mainprize, 2011), (f) the painful aspect of the mammogram, (g) the psychological impact (anxiety, depression), and (h) the occurrence of false positives and therefore the implementation of unnecessary treatments and/or invasive procedures (Gøtzsche and Jørgensen, 2013).

In France, the OS program recommends that women aged 50 to 74 should have a mammogram every two years. However, the level of participation has never managed to reach the 70% coverage rate targeted by the cancer plan (INCa, 2014) and has even been decreasing in recent years. The participation rate fell from 52.7% (peak in 2012) to 50.3% in 2018. Note that mammography screening is not limited to this age group. Thus, Individual Screening (IS) appears usual from the age of 40 in France (Haute Autorité de la Santé [HAS], 2013). Women under 40 who are worried about having breast cancer or have a family history may also decide to have a mammogram (Aquaviva et al., 2005).

Women's attitude to this test appears to depend on a multitude of factors. Some are seen as facilitators, others as barriers (Püschel et al., 2009). Among the facilitating factors, one can mention: (a) the place of perceived control in health (i.e., individuals attribute the health events they experience to an internal or external causality) (Epstein, 2014), (b) personality traits such as conscientiousness (Siegler and Costa, 1994) or type A personality traits (i.e., personality traits defined by competitiveness, sense of urgency and hostility, but

also associated with Consciousness and problem-centered coping strategies) (Ramanaiah et al., 1997), (c) worry about cancer (Consedine et al., 2004) , and (d) the perceived risk of having cancer (Ferrat et al., 2013).

Among the barrier factors, one can mention: (a) fear of disease in general (Lostao et al., 2001), (b) fatalism (Molaei-Zardanjani et al., 2019), (c) shame (Püschel et al., 2009), (d) personality traits such as emotivity (Savabi Esfahani et al., 2018) or lack of openness (Siegler and Costa, 1994), (e) fear of pain (Kalecinski et al., 2015; Lecompte, 2018), (f) the absence of a family history of breast cancer (Duport et al., 2005), and (g) the fact of having children (Savabi-Esfahani et al., 2018).

Motives for agreeing or refusing to have a mammogram

Few studies have focused on the motives for agreeing or refusing to undergo mammography screening. Qualitative studies have shown that the motives given for undergoing mammography screening were related to fear of disease, a desire to control one's health, the influence of breast cancer experiences in others and recommendations from healthcare professionals (Ferrat et al., 2013; Nekhlyudov et al., 2003). The motives given for not having the exam related to fear, low priority given to health issues, traumatic experience of mammograms, worry about ionizing radiation, and the insensitive attitude of radiologists (Kalecinski et al., 2015).

Quantitative studies have shown that the reasons given for engaging in mammography screening were related to fear of breast cancer, an overestimation of the risk of suffering from it, doctor's recommendations and wanting to take care of one's health. The reasons given for not undergoing the examination were related to the lack of time, a fatalistic attitude in the event of a positive diagnosis, or increased risk of invasive procedures linked to this screening (Duport et al., 2005; Rakowski et al., 1992).

The present study

The specific determinants of having or refusing a mammogram have been extensively studied, but only a few studies have looked at the motives reported by women. Apter's Reversal Theory (RT) (Apter, 2001) is a motivational theory that offers the possibility of bringing together and synthesizing the available scientific data and of structuring them around large intelligible factors (Kpanake et al., 2010; Makris & Mullet, 2009). In addition, exploring a research theme through the lens of this theory offers the resources and the perspective necessary to take into account reasons that have sometimes never been examined before (Mullet et al., 2014).

RT considers that motives are dynamic and fluctuating entities influencing the way that humans engage with their environment. Apter (2001) identified ten motivational states divided into four domains: 1) Telic and Paratelic in the domain of Way-Goals; 2) Conformist and Negativist in the field of Rules; 3) Mastery and Sympathy in the field of Transactions; 4) Autocentric, Intra-autic, Allocentric and Pro-autic in the field of Relations.

The *Telic* state is goal-oriented. For example, a possible Telic motive in connection with the refusal to have a mammogram could be: "X-rays are harmful to health". The *Paratelic* state pays attention to pleasant behavior in the present moment. In the *Conformist* state, rules determine the way in which behaviors are ordered, while the *Negativist* state sees the rules as restrictions and seeks to oppose them. The *Mastery* state sees the transaction as a way to take or, conversely, to leave, while the *Sympathy* state considers the transaction as a way to give or receive. The *Autocentric* state aspires to be the center of the interests and concerns of others. The *Intra-autic* state is attentive to its own interests and concerns. The *Allocentric* state is attentive to the needs and interests of others. Finally, the *Pro-autic* state aspires to live the experiences of others by proxy.

Thus, in each domain we systematically find two or four opposing motivational states of which only one can be active at the same time. On the other hand, several domains can be activated simultaneously: combinations between a state of the domain of Transactions and a state of the domain of Relations are particularly frequent (e.g., Allocentric / Mastery or Autocentric / Sympathy) (Apter, 2007). In everyday life, under the influence of various factors, constant shifts called "reversals" can occur from one motivational state to another within the same domain.

The objectives of this research consisted in (a) interpreting the motivational factors inventoried with regard to the dimensions of RT and identifying two factor structures specific to the motives for agreeing and refusing to have a mammogram, (b) exploring whether the motivational factors are linked to the frequency of having mammograms, and beyond, the demographic and personality characteristics such as: age, number of children, intolerance of uncertainty, anxiety, anxiety, and personality traits. Anxiety related to mammography has often been invoked in the context of the disease, but it has never been measured as an individual variable in its own right.

Since, to our knowledge, no study has investigated the motives for consenting to or refusing mammography through the lens of RT, we investigated how the reasons for agreeing or refusing to have a mammogram would organise themselves around the ten motivational states of RT. We also wondered whether there were relationships between intolerance of uncertainty, worry, anxiety and the frequency of screening.

Method

Participants

Four hundred and seventy women were recruited in France by word of mouth, associations, social networks and a call for volunteers within Toulouse Jean-Jaurès University. Three

hundred and ten of them agreed to take part (refusal rate of 34%). The participants were between 18 to 92 years old (*M* = 48.92; *SD* = 13.95), with the following age-group distribution: 28 participants were 18 to 29 years old (9%), 49 were 30 to 40 years old (16%), 74 were 41 to 50 years old (24%), 112 were 51 to 63 years old (36%), 36 were 64 to 74 years old (12%), 7 were 75 to 90 years old (2%), and 4 did not specify their age (1%).

In our sample, 66% of the participants (*n* = 205) had a family history of breast cancer. Sixty-nine percent of participants reported having children (*n* = 212): 23% had 1 (*n* = 69), 31% had 2 (*n* = 96), 15% had 3 or more (*n* = 47), 18% had not (*n* = 56) and 13% did not provide this information (*n* = 42). Out of the entire sample, 80% of participants had already had at least one mammogram (*n* = 248), 18% had never had one (*n* = 57) and 2% did not wish to disclose this information (*n* = 5). In addition, 20% of the participants had already refused to have this examination (*n* = 63), 68% had never refused to have it (*n* = 209) and 12% did not provide this information (*n* = 38).

Material

Two questionnaires were constructed based on the motives identified in the literature and through the completion of a pre-survey.

Pre-survey

The objective of the pre-survey was to identify, through semi-structured interviews, the motives that led women to agree or refuse to have a mammogram. This procedure made it possible to inventory a large number of motivational factors, some of which have been little studied in the literature. Twelve participants, more or less favorable to mammographic screening, aged 25 to 61, freely agreed to participate. Four healthcare professionals also took part in this pre-survey, with a view to varying the data sources. Semi-structured interviews lasting an average of 30 minutes were carried out. They were all recorded, transcribed and then analysed. Content analyses were carried out on the entire corpus and several dimensions

emerged such as lack of information, need to be reassured, the phenomenon of habit, social influences, mistrust, opposition to medicine or to injunctions, desire to take preventive action or verify, desire to take care of oneself or to reassure one's entourage, dehumanization of care, fear of cancer, painful aspect of the examination, collectivist perspective or even identification with sick or healthy relatives. All of the motives identified during this pre-survey were interpreted with regard to the dimensions of RT and transposed into items in order to develop two questionnaires.

Survey

The first questionnaire listed 105 facilitating motives and the second 115 barrier motives. Each item started out the same way: *"One of the reasons that would drive me to have a mammogram is that…"* or *"One of the reasons that would drive me to refuse to have a mammogram is that…"*. These repetitions allow the respondent to adopt an open attitude towards these motives. Too often, we tend to consider that to one action corresponds one motive, and only one. All theoretically possible motivational states of RT were represented in each of the two questionnaires. To answer each item, the participants positioned themselves on an 8-point response scale (1-8) ranging from "strongly disagree" on the left to "strongly agree" on the right. Four additional tools were also used: the Uncertainty Intolerance Scale (EII) (Freeston et al., 1994), the Penn State Worry Questionnaire (PSWQ) (Meyer et al., 1990), the General Anxiety Disorder 7 (GAD-7) (Spitzer et al., 2006), and the 24-item Brief HEXACO Inventory (BHI) (De Vries, 2013). Lastly, a questionnaire to collect socio-demographic data as well as the frequency of mammography screening was included in the research protocol. To assess the latter variable, participants had to answer the following question "How often do you have a mammogram?" by positioning themselves on a 7-point Likert scale ("never", "every 8 to 10 years and more", "every 5 to 7 years", "every 4 years", "every 3 years", "Every 2 years", "once a year").

Procedure

The participants were asked to read an information sheet and then to answer the questionnaires in a quiet public place or at their home. Both paper and online versions were made available to them. The total test lasted on average 45 minutes. In order to limit the order effect, half of the participants answered first the questionnaire listing the facilitating motives and then the questionnaire listing the barrier motives. The second half of the sample responded in reverse order.

This research received a favorable notification from a Research Ethics Committee (CER).

Results

An exploratory factor analysis with principal component extraction was carried out on the 105 facilitating patterns using Statistica 12 software, on a first part of the sample (n = 168). In the scree test, seven factors with eigenvalues between 5.75 and 1.19 and explaining 65% of the total variance were observed. This solution was chosen and was subjected to a standardized VARIMAX rotation. Items that were complex or had too low saturations were gradually removed until the final model was obtained.

The first factor called “Interest of early diagnosis” explained 10% of the variance and referred to the Telic motivational state of RT. It was named thus because its items expressed the positive consequences linked to early diagnosis. The mean score of the items composing it was M = 7.18 (SD = 1.25). The second factor explained 10% of the variance and referred to the combination of Sympathy/Autocentric RT motivational states. It was called “Quality of care” because its items expressed the importance for women that radiologists should have technical but also interpersonal skills. The mean score of the items composing it was M = 5.38 (SD = 1.92).

The third factor explained 11% of the variance and referred to the Conformism state of RT. It was called “Habit” because its items expressed how mammography could become, over time, a full-fledged health habit. The mean score of the items composing it was *M* = 4.41 (*SD* = 2.12). The fourth factor explained 9% of the variance and referred to the Conformism state of RT. It was called the “Collectivist Perspective” because its items expressed an aspiration to undergo a mammogram linked to collective interest. The mean score of the items composing it was *M* = 2.50 (*SD* = 1.63).

The fifth factor explained 9% of the variance and referred to the combination of Mastery/Allocentric RT motivational states. It was called “Follow the doctor's advice” because its items expressed the influence of the doctor's advice on women's attitudes towards mammography. The mean score of the items composing it was *M* = 6.20 (*SD* = 1.52). The sixth factor explained 7% of the variance and referred to the Pro-autic state of RT. It was called “Cancer(s) in the entourage” because its items expressed the fact that cancer experiences in the near environment could be lived by proxy. The mean score of the items composing it was *M* = 5.13 (*SD* = 2.65). Finally, the seventh factor explained 9% of the variance and referred to the Intra-autic state of RT. It was called “Hypochondriac Beliefs” because its items expressed hypochondriac fears. The mean score of the items composing it was *M* = 4.13 (*SD* = 1.83).

The same procedure was applied to the 115 barrier motives. A six-factor solution presenting eigenvalues between 6.87 and 1.12 and explaining 70% of the variance was retained. The first factor explained 13% of the variance and referred to the Pro-autic state of RT. It was called “Absence of cancer in the entourage” because its items expressed immersion in an environment where this pathology does not exist (identification with a healthy entourage). The mean score of the items composing it was *M* = 1.91 (*SD* = 1.45).

The second factor explained 14% of the variance and referred to the combination of Intra-autic/Mastery RT motivational states. It was called “Anxiety” because its items expressed apprehension specific to the discovery of breast cancer and the lack of control over its consequences. The mean score of the items composing it was *M* = 2.99 (*SD* = 2.03). The third factor explained 13% of the variance and referred to the combination of Allocentric/Mastery RT motivational states. It was called “Physical and Moral Pain” because its items expressed the physiological and psychological impact that the exam could have on women. The mean score of the items composing it was *M* = 3.17 (*SD* = 1.94).

The fourth factor explained 10% of the variance and referred to the intra-autic motivational state of RT. It was called “Spatio-temporal difficulties” because its items expressed practical constraints such as lack of time or accessibility. The mean score of the items composing it was *M* = 2.46 (*SD* = 1.76). The fifth factor explained 11% of the variance and referred to the Paratelic state of RT. It was called “Lack of information” because its items expressed the problem of the insufficiency of the information provided, questioning the practice of mammography itself. The mean score of the items composing it was *M* = 3.46 (*SD* = 1.90). Finally, the sixth and final factor explained 9% of the variance and referred to the negativist state of the RT. It was called “Aspiration for Freedom” because its items expressed opposition to being pressured into doing a health exam. The average score of the items composing it was *M* = 1.74 (*SD* = 1.09).

Confirmatory factor analyses were performed on a second part of the sample (*n* = 126). A first confirmatory factor analysis was carried out on the motives for undergoing a mammogram using Statistica 12 software (see Table 1). Of the 26 items that emerged from the exploratory factor analysis, 22 were retained for confirmatory factor analysis. Four items were removed because they saturated less than the other items on their dimension. The GFI value was .84; the CFI value was .91; the RMSAE value was .05 [.00-.08]; the Chi^2/Df ratio (265.55/188)

was 1.41, the p-value was .001. The fit index of the data model confirmed that this solution of the motives for having a mammogram in seven factors was satisfactory. The internal consistency of the seven patterns retained was generally good (respectively from I to VII, α = .80, .76, .78, .74, .70, .69, .70).

A second confirmatory factor analysis was carried out on the motives for refusing to have a mammogram (see Table 2). To conduct this analysis, all the items that emerged from the exploratory analysis were kept. The GFI value was .80; the CFI value was .87; the RMSAE value was .08 [.00-.08]; the Chi²/Df ratio (406.81/194) was 2.10, the p-value was .001. Although this model was slightly less satisfactory, it was still acceptable since the values of the indices approached the significance thresholds and the internal consistency of the factors composing it was excellent (respectively from I to VI, α = .87, .86, .90, .75, .87, .81).

[Insert here Table 1]

[Insert here Table 2]

On this same sample (n = 126), bivariate correlation analyses were then carried out between motivational factors, variables such as age, number of children, intolerance to uncertainty, worry, anxiety, personality traits and mammogram frequency (see Table 3). The frequency of mammography screening was strongly associated with age r = .64, p < .01, with the "Habit" factor, r = .55, p < .01, and more moderately with the number of children(s), r = .25, p < .01. It was negatively associated with the factors "Spatio-temporal difficulties", r = -.40, p < .01, "Physical and moral pain", r = -.31, p < .01, and "Lack of information", r = -.25, p < .01. In other words, the older a woman was, had a high number of children, was accustomed to mammography, had little regard for spatio-temporal constraints, perceived this examination less as physically and psychologically painful, had less the feeling of lacking information, the more frequently she underwent mammograms. No personality trait was significantly

associated with the frequency of mammogram screening. No association was found between intolerance of uncertainty, worry, anxiety and frequency of the exam.

A series of regression analyses was carried out on the variable "Frequency of mammogram screening". Intolerance to uncertainty, worry and anxiety were tested first and explained 4% of the variance ($F(1,114) = 4.24$, $p = 0.04$): only worry was significant ($\beta = - 0.19$). Personality traits were tested second and explained 7% of the variance ($F(2,113) = 4.21$, $p = 0.01$): only the Consciousness trait was significant ($\beta = -0.23$). Sociodemographic characteristics were tested third and explained 42% of the variance ($F(2,113) = 40.34$, $p < 0.01$): only age was significant ($\beta = 0.61$). Motivational factors were tested fourth and explained 38% of the variance ($F(3, 112) = 23.01$, $p < 0.01$): the factors "Habit" ($\beta = 0.48$) and "Spatio-temporal difficulties" ($\beta = -0.31$) were the only significant ones.

A final step-by-step regression analysis was performed on the predictors integrated simultaneously. Age ($\beta = 0.46$) as well as the factors "Habit" ($\beta = 0.30$) and "Spatio-temporal difficulties" ($\beta = -0.21$) were related to the frequency of mammogram screening. These variables explained 54% of the variance ($F(3, 112) = 43.66$, $p < 0.01$). Their high intensities neutralized the low weight of the "Worries" and "Consciousness" predictors that emerged during the first regression analyses. Thus, being older, being more sensitive to the argument that mammography is common practice and being less sensitive to the motive inherent in space-time constraints, predicted a regular frequency of undertaking this examination.

Discussion

The first objective of this study was to identify the motivational barriers and facilitators to undergoing a mammogram and to interpret them with respect to RT.

The motives in favour of screening appeal, in the order of importance given by women on the response scale, to the Telic state ("Interest of early diagnosis"), the combination of the

Allocentric/Mastery states (“Following the doctor's advice”), the combination of the Sympathy/Autocentric states (“Quality of care”), the Pro-autic state (“Cancer in the entourage”), the Conformism state (“Habit”), the Intra-autic state (“Hypochondriac Beliefs”) and the Conformism state again (“Collectivist Perspective”). The motives for refusal appeal, in the order of importance given by the women on the response scale, to the Paratelic state (“Lack of information”), the combination of the Allocentric/Mastery states (“Physical and moral pain”), the combination of the Intra-autic/Mastery states (“Anxiety”), the Intra-autic state (“Spatio-temporal difficulties”), the Pro-autic state (“Absence of cancer in the entourage”) and the Negativist state ("Aspiration for freedom"). Most of the patterns identified in this research are consistent with the evidence in the literature, but RT has allowed us to deepen our understanding.

The factors “Following the doctor's advice” and “Quality of care” already highlighted elsewhere (Domenighetti et al., 2003; Lecompte, 2018) indicate that while women generally prefer the doctor to have control of their health, they aspire to control the behavior of the technician performing the examination and in particular wish it to be sympathetic and human. The factor “Cancer(s) in the entourage” has also been mentioned in the literature (Duport et al., 2005; Ferrat et al., 2013; Savabi Esfahani et al., 2018). It points to the fact that the experience of breast cancer in the entourage can be lived by proxy – or at least that an identification process can take place – which makes it easier to decide to have a mammogram.

The factor “Hypochondriac beliefs” emerged in our study as a facilitating motive whereas the work of Lostao et al. (2001) suggested that having hypochondriac beliefs was associated with a decrease in mammography practice. Our understanding of the motives for doing this exam, which revolve around fear of disease and the anxieties inherent in cancer, seems tenuous. It is true that in individuals with a form of hypochondria, there is complacency with regard to medical exploration (Lionet and Tiberghien, 2018).

The factor “Interest of early diagnosis” is one of the main arguments used by health professionals (Perry et al., 2007). The goal to be achieved by performing a mammogram is therefore to detect cancer as early as possible in order to benefit from the best care. Finally, the “Habit” and “Collectivist Perspective” factors are motives which have been mentioned very little in the literature dealing with mammography. Regarding the “Habit” factor, it appears that over time mammography becomes a mechanical behavior until it evolves into a health habit. Regarding the factor “Collectivist perspective”, the 100% coverage of mammography by Health Insurance certainly reinforces the idea that this examination is a gift offered by national solidarity in order to serve the common interest – which undoubtedly directs women towards a more collectivist than individual positioning. This is consistent with the results of the study by Domenighetti et al. (2003) reporting that women residing in England and Italy (countries where the health service is public) overestimate the benefits of screening compared to women residing in Switzerland and United-States (countries where the health service is private).

Among the six motivational barriers identified, all have been cited in the literature. Note that few of them report a total rejection of mammography screening and that, judging from the average responses of the participants, the reasons for refusal are much weaker than the reasons for acceptance. However, these motivational factors are still good indicators for the medical profession and the preventive health field. The factor “Absence of cancer(s) in the entourage” shows that not being around women with breast cancer probably induces a feeling of less vulnerability (Duport et al., 2005; Ferrat et al., 2013; Savabi Esfahani et al., 2018).

The “Anxiety” factor has also been addressed in the literature (Consedine et al., 2004; Ferrat et al., 2013). It appears here to be a barrier motif which contradicts the results of Consedine et al. (2004) stating that concerns about cancer are positively associated with mammography practice. The terminologies used to describe the anxiety associated with

mammography vary from study to study, which no doubt contributes to maintaining these discrepancies in results. In our research, RT explains that barrier anxiety refers to mental insecurity related to the lack of control over breast cancer and its consequences. Thus, the subject's concerns center on the inability to control future unpleasant events in the event of a positive diagnosis. The “Physical and moral pain” factor has also been highlighted in previous studies (Kalecinski et al., 2015; Lecompte, 2018). However, RT enriches this knowledge by specifying that the difficulty inherent in physical and moral pain is, in part, due to the fact of not being able to control the degree of interest shown by health professionals in the patient during the examination.

The “Spatio-temporal difficulties” factor has already been noted in several studies (Duport et al., 2005; ORS, 2001). It essentially refers to the issue of time management or the difficulties inherent in making an appointment. The “Lack of information” factor has often been deplored in the literature (Cases et al., 2016; Hersch et al., 2016). It is suggested that the goal that women seek to achieve by refusing to have a mammogram is to protect themselves from an examination they feel suspicious of due to the vagueness of the information provided. The “Aspiration for freedom” factor has also been mentioned in the literature, but succinctly and only in a few studies (Kalecinski et al., 2015; Lecompte, 2018). In this factor, the rule is experienced as a restriction which women seek to oppose by adopting an unconventional attitude in order to feel free.

The second objective of this study was to examine whether motivational factors, and variables such as age, number of children, intolerance of uncertainty, worry, anxiety, and personality were linked to the frequency with which mammograms were performed. First, intolerance of uncertainty, worry and anxiety were not related in our study to the frequency of having mammograms (neither were the motivational factors “Anxiety” and “Hypochondriac Beliefs”). Thus, although the literature has been very interested in this type of variable in this

particular context, their links with mammographic frequency remain insignificant in our study. Personality traits are also unrelated to how often mammograms are performed. The observations of Siegler and Costa (1994) about a positive effect of the Awareness factor and a negative effect of the Openness factor on the decision to undergo mammography are therefore not verified here. Regarding socio-demographic characteristics, it was observed that the more children the women have, the higher the frequency of having mammograms. In addition, it was also observed that the older women get, the more frequently they tend to have this exam – which appears consistent with the age groups targeted by breast cancer screening. It therefore appears that women's attitudes towards mammography are not linear and are likely to vary over time. RT claims that human motivations are subject to fluctuations. In addition, four motivational factors – "Habit", "Physical and moral pain", "Spatio-temporal difficulties" and "Lack of information" – maintain a relationship with the frequency of screening. The factors "Spatio-temporal difficulties" and "Physical and moral pain" involve transactional emotions (Apter, 2001). Thus, the frequency of having a mammogram is negatively linked to individual concerns which nevertheless form part of the social universe of women. They focus their attention on their personal interests and on their desire to be recognized for who they are – that is, full individuals who must be distinguished from others. In addition, the factors "Habit" and "Lack of information" involve somatic emotions (Apter, 2001). Thus, mammographic frequency is positively linked to internal feelings such as the desire to be integrated into the community by adopting the majority behavior. It is also negatively linked to internal feelings such as trying to protect oneself from an exam for which there is insufficient information.

The question then arises as to how these elements of knowledge can be discussed in the medical consultation. And how can they help initiate new thinking in terms of breast cancer screening policy? It seems necessary for health actors (ministry and doctors included) to

provide women with clear and fair information about the benefits and risks of mammography. Screening policies should certainly value informed choice rather than maximizing the use of mammography (Hersch et al., 2015). In addition, the physician can listen to and understand women's need for control and freedom, while being careful not to clumsily adopt a defensive attitude that may be counterproductive. It could be interesting in future research to question how physicians are emotionally affected by the attitude and arguments of reluctant women. Better understanding the emotions at play during this type of consultation can help to reorganize the framework and the content of the doctor/patient exchanges. In addition, detecting the health habits of women resistant to mammography is also crucial.

Limits

This study has several limitations. First, the research protocol was relatively substantial: cognitive fatigue may have appeared at the end of the test. Second, this study had a virtual nature: it is possible that in a real situation, the motives given are not the same as in a hypothetical situation (especially for the women who have never had a mammogram) (Coniasse Brioude, 2011). Finally, third, the sample did not appear to be fully representative. It was mainly made up of women who had already agreed to have at least one mammogram (those refusing to have one mostly refused to participate in the study). According to the work of Mulot (2009) on the wearing of condoms “the answers given in the context of quantitative surveys correspond to the official public register, that of the norm, and do not always reflect the reality of effective behaviour”. We are then faced with a paradox: how to readjust large-scale public health policies such as organized screening if one is unable to consider the opinion of those who are the most resistant? Doesn't that make the turnout problem insoluble? It might be interesting to understand why women opposed to mammography also oppose research into it. Is this an expression of a broader mistrust that needs to be further explored? The lack of access to certain populations is in any case a problem that affects all research in

general.

Statements and Declarations

Conflict of interest : The authors declare no conflict of interest.

Acknowledgment : No acknowledgment.

Ethic approval and consent to participate : This research received a favorable notification (N ° 2018-119) from the Research Ethics Committee (CER) of Toulouse, France.

Research Data Policy and Data Availability Statements: The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

References

Apter MJ (2001) *Motivational styles in everyday life: A guide to reversal theory.* Washinghton: American Psychological Association.

Apter MJ (2007) *Reversal theory: The Dynamic of Motivation, Emotion and Personality.* London: Oneworld Publications.

Aquaviva E, Aubron V, Bajos N, Baudier F, Beaulleu Prévost D, Beck F, Blanchet A, Bourdessol H, Briffault X, Collin JF, Dardennes R, Erpelding ML, Escalon H, Gautier A, Guilbert P, Jouvin E, Julien D, Kubiak D, Lamboy B, … Wilquin JL (2005) Baromètre santé 2005. Available at: www.santepubliquefrance.fr/docs/barometre-sante-2005

Autier P and Boniol M (2018) Mammography screening: A major issue in medicine. *European Journal of Cancer* 90: 34-62. DOI: 10.1016/j.ejca.2017.11.002

Cases C, Di palma M, Drahi É, Fainzang S, Landais P, de Montgolfier S, Paccaud F, Rivière JP and Thouvenin D (2016) *Ensemble améliorons le dépistage du cancer du sein*. Report, Citizen and scientific consultation, Paris, September.

Coniasse Brioude D (2011) *Déterminants psychologiques de l'acceptation et du refus de participer à un essai clinique destiné à prevenir la maladie d'Alzheimer en population âgée fragilisée*. PhD Thesis, University of Toulouse, France.

Consedine NS, Magai C and Neugut AI (2004) The contribution of emotional characteristics to breast cancer screening among women from six ethnic groups. *Preventive Medicine: An International Journal Devoted to Practice and Theory* 38(1): 64-77. DOI: 10.1016/j.ypmed.2003.09.030

de Vries RE (2013). The 24-item Brief HEXACO Inventory (BHI). *Journal of Research in Personality* 47(6): 871-880. DOI: 10.1016/j.jrp.2013.09.003

Domenighetti G, D'Avanzo B, Egger M, Berrino F, Perneger, T, Mosconi and Zwahlen M (2003) Women's perception of the benefits of mammography screening: Population-based survey in four countries. *International Journal of Epidemiology* 32(5): 816-821. DOI: 10.1093/ije/dyg257

Duport N, Ancelle Park R, Boussac Zarebska M, Urhy Z and Bloch J (2005) Facteurs d'adhésion au dépistage organisé du cancer du sein : étude Fado-sein. *Bulletin Épidémiologique Hebdomadaire* 44: 429-431.

Epstein L (2014) *The Influence Of Perceived Control On Breast Cancer Screening In Hispanic/latino Women*. PhD Thesis, University of Yale, Connecticut.

Ferrat E, Le Breton J, Djassibel M, Veerabudun K, Brixi Z, Attali C and Renard V (2013) Understanding barriers to organized breast cancer screening in France: women's

perceptions, attitudes, and knowledge. *Family Practice* 30(4): 445-451. DOI: 10.1093/fampra/cmt004Fink R, Shapiro S and Roester R (1972) Impact of efforts to increase participation in repetitive screenings for early breast cancer detection. *American Journal of Public Health* 62(3): 328-336. DOI: 10.2105/ajph.62.3.328

Freeston MH, Rhéaume J, Letarte H, Dugas MJ and Ladouceur R (1994). Why do people worry? *Personality and Individual Differences* 17(6): 791-802. DOI: 10.1016/0191-8869(94)90048-5

Gøtzsche PC and Jørgensen KJ (2013). Screening for breast cancer with mammography. *The Cochrane Database System of Systematic Reviews 6.* Article CD001877. DOI: 10.1002/14651858.CD001877

Haute Autorité de la Santé. (2013, 21 mars). *Dépistage du cancer du sein chez les femmes de 40 à 49 ans et de 70 à 79 ans en France.* [Note de cadrage]. https://www.has-sante.fr/upload/docs/application/pdf/2013-10/note_de_cadrage_-_depistage_du_cancer_du_sein_chez_les_femmes_de_40-49_ans_et_70-79_ans.pdf

Hersch J, Barratt A, Jansen J and Irwig L (2016) The importance of enabling informed decision making for women considering breast cancer screening. *Journal of Medical Screening* 23(1): 55-55. DOI: 10.1177/0969141315612818

Hersch J, Barratt A, Jansen J, Irwig L, McGeechan K, Jacklyn G, Thornton H, Dhillon H, Houssami N and McCaffery K (2015) Use of a decision aid including information on overdetection to support informed choice about breast cancer screening: a randomised controlled trial. *The Lancet* 385(9978): 1642-1652. DOI: 10.1016/S0140-6736(15)60123-4

Institut National du Cancer (2013) Bénéfices et limites du programme de dépistage organisé du cancer du sein : Quels éléments en 2013 ? Available at: www.e-

cancer.fr/content/download/64036/575100/file/Benefices-limites-du-programme-de-depistage-cancer-sein2013.pdf+&cd=1&hl=fr&ct=clnk&gl=fr&client=firefox-b-d

Institut National du Cancer (2014) Cibles et Indicateurs du Plan Cancer 2014-2019. Available at: www.e-cancer.fr/content/download/86063/875281/file/Indicateurs-Plan-Cancer-3-Document-de-synthese-2014-10-24.pdf

Jehannin Ligier K, Molinie F, Defossez G, Daubisse Marliac L, Dantony E, Uhry Z, Remontet L and Bossard N (2017) Projection de l'incidence et de la mortalité par cancer en France métropolinaine en 2017. Available at: www.santepubliquefrance.fr/docs/projection-de-l-incidence-et-de-la-mortalite-par-cancer-en-france-metropolitaine-en-2017

Kalecinski J, Régnier Denois V, Ouédraogo S, Dabakuyo Y, Dumas A, Arveux P and Chauvin F (2015) Dépistage organisé ou individuel du cancer du sein ? Attitudes et représentations des femmes. *Santé Publique* 27(2): 213-220. DOI: 10.3917/spub.152.0213

Kpanake L, Muñoz Sastre MT and Mullet E (2010) Skin Bleaching Among Togolese: A Preliminary Inventory of Motives. *Journal of Black Psychology* 36(3): 350-368. DOI: 0.1177/0095798409353759

Lecompte H (2018) Dépister les cancers du sein… Représentations des médecins, informations délivrées aux femmes et enjeux du dépistage organisé. Report, University of Bretagne, France, April.

Lemogne C, Turinici M, Panjo H, Ngo C, Canoui Poitrine F, Chauvet Gelinier JC, Limosin, F, Consoli SM, Goldberg M, Zins M and Ringa V (2018) Personality and breast cancer screening in women of the GAZEL cohort study. *Cancer Medicine* 7(2): 515-524. DOI: 10.1002%2Fcam4.1268

Lionet B and Tiberghien S (2018) Les fonctions du masochisme dans l'aménagement somatopsychique du patient douloureux. *Douleur et Analgésie* 31(1): 16-20. DOI: 10.1007/s11724-017-0523-2

Lostao L, Joiner TE, Pettit JW, Chorot P and Sandin B (2001) Health beliefs and illness attitudes as predictors of breast cancer screening attendance. *The European Journal of Public Health* 11(3): 274-279. DOI: 10.1093/eurpub/11.3.274

Lousdal ML, Kristiansen IS, Møller B and Støvring H (2016) Effect of organised mammography screening on stage-specific incidence in Norway: population study. *British Journal of Cancer* 114(5): 590-596. DOI: 10.1038/bjc.2016.8

Makris I and Mullet E (2009). A systematic inventory of motives for becoming an orchestra conductor: a preliminary study. *Psychology of Music* 37(4): 1-16. DOI: 10.1177/0305735608100373

Meyer TJ, Miller ML, Metzger RL and Borkovec TD (1990) Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy* 28(6): 487-495. DOI: 10.1016/0005-7967(90)90135-6

Molaei Zardanjani M, Savabi Esfahani M and Taleghani F (2019) Fatalism in breast cancer and performing mammography on women with or without a family history of breast cancer. *BioMedCentral Women's Health* 19(116): 1-5. DOI: 10.1186/s12905-019-0810-6

Mullet E, Kpanake L, Zounon O, Guedj M and Muñoz Sastre MT (2014) Putting Reversal Theory's Model of Four Domains of Experience in the Hot Seat. *Journal of Motivation, Emotion, and Personality* 2(1): 1-9. DOI: 10.12689/jmep.2014.201

Mulot S (2009) Comment les représentations des rapports de sexe influencent-elles la prévention du sida ? *Revue française de sociologie* 50(1): 63-89. DOI: 10.3917/rfs.501.0063

Nekhlyudov L, Ross Degnan D and Fletcher SW (2003) Beliefs and expectations of women under 50 years old regarding screening mammography: a qualitative study. *Journal of General Internal Medicine* 18(3): 182-189. DOI: 10.1046/j.1525-1497.2003.20112.x

Perry N, Broeders M, de Wolf C, Törnberg S, Holland R and von Karsa L (2007) European guidelines for quality assurance in breast cancer screening and diagnosis. Fourth edition-summary document. *Annals of Oncology : Official Journal of the European Society for Medical Oncology* 19(4): 614-622. DOI: 10.1093/annonc/mdm481

Püschel K, Thompson B, Coronado G, Gonzalez K, Rain C and Rivera S (2009) "If I feel something wrong, then I will get a mammogram": Understanding barriers and facilitators for mammography screening among Chilean women. *Family Practice* 27(1): 85-92. DOI: 10.1093/fampra/cmp080

Raffle AE (2001) Information about screening - is it to achieve high uptake or to ensure informed choice? *Health Expectations* 4(2): 92-98. DOI: 10.1046/j.1369-6513.2001.00138.x

Rakowski W, Dube CE, Marcus BH, Prochaska JO, Velicier, WF and Abrams DB (1992) Assessing elements of women's decisions about mammography. *Health Psychology* 11(2): 111-118. DOI: 10.1037//0278-6133.11.2.111

Ramanaiah NV, Sharpe JP and Byravan A (1997) Type A Behavior and the Five-Factor Model of Personality. *Psychological Reports* 81(2): 368-370. DOI: 10.2466/pr0.1997.81.2.368

Savabi Esfahani M, Taleghani F, Tabatabaeian M and Noroozi M (2018) A qualitative exploration of personality factors in breast cancer screening behavior. *Social Behavior and Personality* 46(1): 91-98. DOI:10.2224/sbp.6564

Siegler IC and Costa P (1994) Personality and breast cancer screening behaviors. *Annals of Behavioral Medicine* 16(4): 347-351.

Spitzer RL, Kroenke K, Williams JB and Löwe B (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of Internal Medicine* 166(10): 1092-1097. DOI: 10.1001/archinte.166.10.1092

Yaffe MJ and Mainprize JG (2011) Risk of Radiation-induced Breast Cancer from Mammographic Screening. *Radiology* 258(1): 98-105. DOI: 10.1148/radiol.10100655

Table 1

Results of the confirmatory factor analysis concerning the motives for agreeing to have a mammogram

One of the reasons that would drive me to have a mammogram is that…	Factors								
	I	II	III	IV	V	VI	VII	*M*	SD
… early diagnosis could increase the chances of recovery.	.83							7.36	1.52
… early diagnosis could allow better care	.78							7.49	1.32
… I want us to be able to detect a tumor as soon as possible.	.73							7.35	1.62
… early diagnosis could allow less burdensome treatment.	.69							7.22	1.42
… the radiology center team is friendly.		.87						4.75	2.51
… the radiology center team is human.		.79						6.13	2.23
… I've got into the habit of doing this exam.			.83					5.33	2.81
… as a woman, I am used to breast examinations.			.76					5.58	2.38
… It is a common exam for me.			.73					4.57	2.58
… I tolerate the pain of the exam well.			.64					4.23	2.66
… I would feel guilty about the public money that would be spent is I was diagnosed with cancer late.				.76				2.31	2.01
… I would feel guilty for refusing what social security offers me.				.75				2.82	2.31
… I want to get the sympathy of my relatives who tell me to do it.				.71				2.08	1.72
… I perform this exam in a collective interest, out of civic duty.				.60	.32			3.06	2.23
… my gynecologist encouraged me to do so.	.30				.79			6.74	1.82
… my doctor convinced me.					.77			5.99	2.19
… I have a family history of breast cancer.						.85		5.91	2.88
… relatives have had breast cancer.						.81		5.93	2.65
… the possibility of having breast cancer regularly scares me.							.77	4.99	2.45
… I often feel like I'm going to get sick.		.35					.67	2.67	1.88
… even though my doctor thinks I have nothing, I still have some doubts.					.41		.63	5.15	2.67
… I fear dying and leaving my children, my family.				.36			.56	4.76	2.44
M	7.34	5.44	4.92	2.56	6.36	5.92	4.38		
SD	1.23	2.14	2.01	1.57	1.76	2.42	1.73		
Cronbach alpha	.80	.76	.78	.74	.70	.69	.70		

Note. I, Interest of early diagnosis; II, Quality of care; III, Habit; IV, Collectivist perspective; V, Following the doctor's advice; VI, Cancer(s) in entourage; VII, Hypochondriac beliefs

Table 2

Results of the confirmatory factor analysis concerning the motives for refusing to have a mammogram

One of the reasons that would drive me to refuse to have a mammogram is that…	Factors							
	I	II	III	IV	V	VI	*M*	SD
… we never talk about cancer in my closedenvironment.	.79						1.68	1.57
… none of my relatives have had breast cancer.	.79						1.43	1.39
… no one does this exam in my family.	.78						1.41	1.33
… I have no family history of breast cancer.	.78					.31	1.71	1.72
… I am worried about waiting for the exam results.		.79					2.96	2.43
… this exam makes me think of my own death.		.78					2.46	2.25
…I am afraid I won't know how to deal with it if I find out that I have cancer.		.77					3.04	2.44
… I don't want cancer to be found because I won't be able to live normally.		.59	.33				2.16	2.08
… I find the exam violent.			.88				3.28	2.45
… I am afraid of suffering during the exam, afraid of pain.			.84				2.88	2.46
… I find the examination dehumanizing (loss of dignity).			.74				2.52	2.22
… radiologists have no regard for the pain experienced during the exam.			.71	.31			3.48	2.22
… I have a lot of difficulty making an appointment (medical or otherwise).				.82			2.11	1.94
… I don't have the time.				.75			2.46	2.22
… I can't put up with having to schedule an appointment.				.70		.39	2.06	1.90
… we are only given information on why to do it, and not on why not to do it.					.78		3.40	2.54
… there is not enough information to make an informed decision.			.35		.76		3.14	2.50
… some scientific researchers question this examination.					.75	.35	3.38	2.35
… there is a lack of quantitative information on the benefits of screening.		.38			.68		3.43	2.40
… I am satisfied with myself when I resist the "injunction to do".						.79	1.71	1.63
… I don't want to encourage other people to perform this exam by doing it myself.	.38					.74	1.42	1.23
…I can't put up with others telling me what to do.						.70	1.90	1.74
M	1.57	2.65	3.04	2.21	3.34	1.69		
SD	1.34	1.93	2.12	1.65	2.07	1.38		
Cronbach alpha	.87	.86	.90	.75	.87	.81		

Note. I, Absence of cancer in entourage ; II, Anxiety ; III, Moral and physical pain ; IV, Spatio-temporal difficulties ; V, Lack of information ; VI, Aspiration to freedom