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## **Consumption of medicine in France: a social groups approach**

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## Résumé

La vente de médicaments est en constante augmentation. En moyenne, ce sont 48 boîtes de médicaments qui sont vendues par personne et par an. La France est championne d'Europe de consommation de médicaments. Nous avons tenté de comprendre ce phénomène à la lumière des représentations sociales (Moscovici, 1961). Dans une étude exploratoire (N = 54) nous avons collecté, à l'aide de la technique d'associations verbales, les principaux éléments associés au médicament. Dans une seconde étude (N = 166), le test d'indépendance au contexte révèle des différences de représentations sociales en fonction de l'âge, le genre, et le niveau d'éducation. Il apparaît que chaque groupe social a une relation spécifique au médicament, ce qui doit être pris en compte dans les recommandations de santé.

**Mots clés :** Représentations sociales, noyau central, médicament, groupes sociaux, psychologie de la santé.

## Abstract

The demand for pharmaceutical medicine is constantly increasing. In average, a Frenchman buys 48 boxes of medicine a year. France's individual spending is higher than any other European country. We tried to analyze this fact in light of the social representations theory (Moscovici, 1961). In the exploratory study (N=54) we collected, with a classical verbal association task, the main words related to medicine. In the second study (N=166) the test of context independence revealed the representational differences according to age, gender, and level of education. It appears that social groups tend to have a specific interaction with medicine, which must be considered in order to adapt health recommendations to all social groups.

**Key words:** Social representations, central core, medicine, social groups, health psychology.

## Introduction

The average Frenchman purchases 48 boxes of medicines a year, which makes him the biggest consumer in the whole Europe. According to a report from the French National Health Service Online (Ameli, 2011), pharmaceutical industries earned 21 billion euros in 2009. The increasing of longevity and the decreasing of death rate could partly explain that phenomenon. However, in accordance to many authors (Mishara and Légaut, 2000; Pérodeau and al, 2005), we believe that this high consumption of medicines cannot be explained by biological factors only. Throughout the theory of *social representations* (Moscovici, 1961) we have tried to find out how people consider medication, not only relying on the actual knowledge of the medicine, but also on beliefs, hopes, and opinions, causing the theoretical framework to be based on the social representations (Moscovici, 1961).

## Background

The theory of social representations can be defined as a set of information, opinions, beliefs and values shared among a social group to describe a social object. Throughout their representations, social groups organize their social environment and simplify it. Afterwards, objects become understandable, so people can interact with it, and talk about it. A structural approach of this theory has been developed by French authors (see, among others, the works of Abric, 2003; Moliner, 1994; and Rateau, Moliner, Guimelli & Abric, 2011) who suggest a double system: the central core, which contains the strongest items of the representation, shared by the vast majority of the social group, and the peripheral system, more individualistic, and depending of the context. Amongst the different ways to comprehend the element of the central core, the most recent is the *test of context independence* (TCI) by Lo Monaco, Lheureux and Halimi-Falkowicz (2008). According to the authors: “the TCI aims to specify the trans-situational or contingent character of representational elements” (2008, p.119). Moreover, it provides the advantage of a reduced cognitive load perceived, compared to the calling into question technique (Moliner, 1989).

The 19<sup>th</sup> century marked the beginning of the modern medicine. The pharmaceutical industry started to develop synthetic molecules which reduced the high level of mortality. But in those days, research is stagnating. Hence, a significant focus has been set on the different forms a same medicine may take. In France for instance, the leader trademark of paracetamol, Doliprane, might be consumed as capsule, syrup, powder sachet or even suppository; sharing however the same molecule.

Niquette (2005) references the main relationships between the medicine and the users, among them; *utilitarian*: the medicine is perceived by users as the materialized part of the pain's answer. So, in this context, this object has to be efficient and relieving; *affective*: Gittelman and Squires (2011) showed the difficulty to discriminate a medicine from a candy, within two groups, both children and adults. The medicine has a strong symbolism power which refers to the sweetness of the childhood, *cognitive*, the medications require techniques, but they have been constructed, learned and acquired.

The sale of medication increased, and so the longevity. As we get older, as we take more and more medicines. 50% of the refund of the healthcare refunds is devoted to the 55 of age and older. 1.2 billion of elderly people consumes at least 7 medicines and more a day (Hordé & Gabillat, 2006). Last but not least, the consumption of psychotropic substances also increases with age (Collin & Ankri, 2003).

Aïach and al (2001) evoke a health inequality in regard of gender. Women consult the doctor more often than men but their working conditions are less painful. Also, they live much longer but their quality of life is relative, composed by an important part of widowhood and other losses. Women are also considered as the pharmacist in their house.

Boltanski (1971), made the connection between health behaviors and social class. Indeed, the perception of a treatment is different, according to the patient's social class. Higher social tend to transform a bad corporal sensation in a symptom. According to the author, it would be the result of the reduction of the patient / doctor hierarchy.

Elderly, gender, social class. Those three variables may show differences. In order to verify this hypothesis, analyses must be done.

## **Method**

### **Study 1**

#### **Participants, material and procedure**

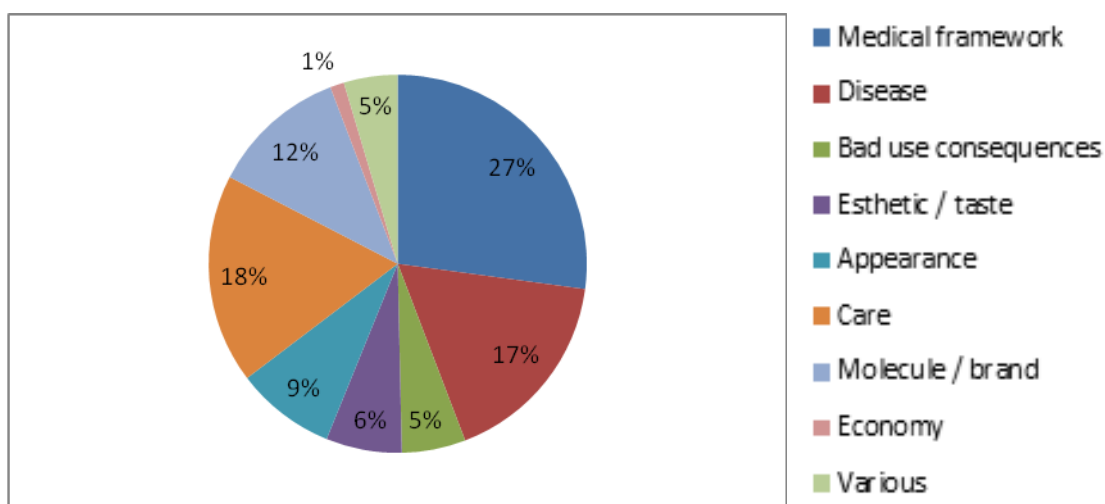
The present study mobilized 54 French males and females recruited online (M= 23.6, SD= 3.5). None of them was remunerated. Participants completed individually a verbal association task (VAT) online based on the word "medicine", containing blanks to fill in.

They could write from one to sixteen words, sentences, adjectives, ideas associated to this word.

## Results

The population produced 573 words ( $M=10.61$ ,  $SD= 4.08$ ) that we analyzed and split into nine categories: *medical frame*, which contains items related to medical staff, medical structures as pharmacy or hospital, *disease*, related to symptoms, *bad use consequences* are the secondary effects of medicine, *esthetic / taste*, are shape and flavor's medicine, *appearance*, the container, *care*, the relieved after the medication is taken, *molecule / brand*, the medications when they are named according to the active principle or the brand, *economy* are the items related to the price of medicine and *various*. The main items of those categories became the material of the questionnaire of the second study.

Graphic 1: repartition of the categories



The analysis of the distribution reveals the importance of the *medical framework* when the word medicine is thought (27%), followed by *care* and *disease*, which are also two important associations (respectively 18% and 17%). Then, the *molecules or brands* of the medicines are quoted (12%). The *appearance* of the container are named in the fifth instance (9%), and eventually, in approximately the same proportions, the *esthetic or taste* of the medicine itself (6%), the *bad use consequences* (5%), and *various* (5%). The minor category is related to the dimension of *economy* (1%).

## Study 2

### Participants, material and procedure

166 participants were divided into age bracket (from 18-24, 25-34, 35-44, 45-54, to 55 and more), gender (male, female), and level of education (no diploma, BEP or CAP (technical school certificates), High School Certificate, Bachelor, or Master's degree).

**Table 1.** Number of participants per age, gender or level of education.

Age bracket	18-24	25-34	35-44	45-54	55 and more
	92	44	10	11	8

Gender	Males	Females
	43	123

Level of education	No diploma	BEP/CAP	High school certificate	2 <sup>nd</sup> year of Bachelor	Bachelor's degree	Master
	8	8	10	45	39	56

The more the category was overriding among the whole entity, the more items were extracted from it. A total of twenty items were presented: *from the medical and pharmaceutical research, prescribed by a doctor, sold in pharmacy, covered by social welfare, associated to a disease, associated to a symptom, presents a danger, presents a constraint for the patient, consumed in an abusive way, provides care for the patient, cures, relieves the patient, contains an active substance, sold under a brand, has a defined function, expensive, has an unpleasant taste, sold in a big quantity, sold into a box, and distributed in hospital*. According to the test of context independence (TCI) of Lo Monaco, Lheureux and Halimi-Falcowicz (2008), each item was presented as an affirmation. For the word “pharmacy” for example, the sentence was “a medicine is, always, in any case, sold in pharmacy”. Participants responded to the items on a 4-point Likert scale, ranging from *strongly disagree* (1) to *strongly agree* (4). A large part of the social group analyzed has to be strongly agreed on an item to consider it as central. According to the TCI, the threshold of consensually in each group is defined by the Kolmogorov-Smirnov test (Kanji, 1999).

## Results

In order to identify the homogeneous groups of variables, a hierarchical cluster analyze has been done. Based on the participants' answers, this statistical test aims to understand the links between the items. Three main dimensions have been isolated: "knowledge of the processes of fabrication and selling of medicine" containing the items *from the medical and pharmaceutical research, contains an active substance, has a defined function, associated to a symptom, sold in pharmacy and sold into a box*, "legitimacy of medicine use" (*prescribed by a doctor, associated to a disease, covered by social welfare and distributed in hospital*). The last dimension is the "impact of medicine" (*presents a danger, consumed in an abusive way, provides care for the patient, relieves the patient, sold under a brand, expensive, has an unpleasant taste and sold in a big quantity*).

## Social representations and age

Quantitatively, the number of elements in the central core increase with age: one in the 18-24 age group, four in the 25-34 age group, thirteen for the 35-44 age group, sixteen for the 45-54 age group and the older group, the 55 and over, has also sixteen central items. The relieving associated to the medicine seems to be an important part of any representation. But, as the age bracket is older, as the medicine contains various dimensions. For the 25-34, a medicine has to be the product of the research but has to be associated to a symptom to relieve, and contained in a box, which is not the case with the youngest. For the 35-44 age bracket, we can notice the superiority of items linked to the misuse of medicine but at the same time the care provided by it. The cost is considered as higher, considered as the previous age brackets. The 45-54 age bracket includes almost all the items in its central core but the fact that a medicine is necessary covered by the social welfare, the abuse, the taste and the drug administration in hospital. Eventually, the oldest has almost the same representation, except they don't consider that the medicine has to be associated to a disease, and it does not represent a constraint. But on the other hand, they consider that the medicine is always covered by social welfare and has an unpleasant taste.

The hierarchical cluster analyses shows a statistically significant difference for the "legitimacy of medicine use" dimension  $F(4,161) = 3.54$ ,  $p < .01$  among the different age brackets but the other dimensions did not show significant differences among the groups.

Table 2. Centrality per age bracket.

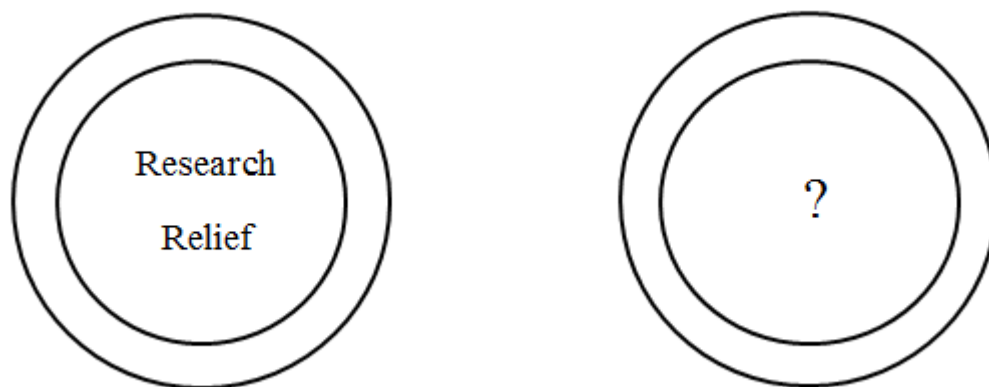
Age bracket	18-24	25-34	35-44	45-54	55 and more
Items					
Research	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>
Prescription	Peripheral	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>
Pharmacy	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>
Social welfare	Peripheral	Peripheral	Peripheral	Peripheral	<b>Central</b>
Disease	Peripheral	Peripheral	Peripheral	<b>Central</b>	Peripheral
Symptom	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>
Danger	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>
Constraint	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>	Peripheral
Abuse	Peripheral	Peripheral	<b>Central</b>	Peripheral	Peripheral
Care	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>
Cure	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>
Relief	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>
Active substance	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>
Brand	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>
Defined function	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>
Expensive	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>	<b>Central</b>
Taste	Peripheral	Peripheral	Peripheral	Peripheral	<b>Central</b>
Big quantity	Peripheral	Peripheral	Peripheral	<b>Central</b>	<b>Central</b>
Box	Peripheral	<b>Central</b>	Peripheral	<b>Central</b>	<b>Central</b>
Hospital	Peripheral	Peripheral	Peripheral	Peripheral	Peripheral
$\Sigma$ central items	1	4	13	16	16

### Social representations and gender

None of the elements submitted to the men group reached the threshold of consensually, but on the other hand, women have two items in their central core: the research and the relief associated to the medication.

The hierarchical cluster analyses showed a significant difference regarding the dimension “knowledge of the processes of fabrication and selling of medicine” ( $U=2057,5$ ,  $p<.03$ ). It appears indeed that there is a difference in the perceived importance of the research ( $U=1739$ ,  $p<.001$ ), the active substance ( $U=1961$ ,  $p<.01$ ), and the selling place (the pharmacy) ( $U=1980$ ,  $p<.01$ ). But there are not significant differences in the items defined function ( $U=2242$   $p=.168$ ), symptom ( $U=2420$ ,  $p=.509$ ) nor sold in the box ( $U=2115$ ,  $p=.061$ ).

Figure 1. Central core per gender (on the left: women, on the right: men).



### Social representation and level of education

Participants had to choose a level of education in a list of six levels: *no diploma*, *BEP* or *CAP* (technical school certificates), *High School Certificate*, *2<sup>nd</sup> year of Bachelor*, *Bachelor*, or *Master*. Then, their answers were analyzed regarding the 20 items.

Table 3. Centrality per level of education

Level of education Items	No diploma	BEP / CAP	High School Certificate	2 <sup>nd</sup> year of Bachelor	Bachelor	Master
Research	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral
Prescription	<b>Central</b>	<b>Central</b>	Peripheral	Peripheral	Peripheral	Peripheral
Pharmacy	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral	Peripheral	Peripheral
Social welfare	Peripheral	Peripheral	Peripheral	Peripheral	Peripheral	Peripheral
Disease	Peripheral	Peripheral	<b>Central</b>	Peripheral	Peripheral	Peripheral
Symptom	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral
Danger	<b>Central</b>	Peripheral	<b>Central</b>	Peripheral	Peripheral	Peripheral
Constraint	Peripheral	Peripheral	<b>Central</b>	Peripheral	Peripheral	Peripheral
Abuse	Peripheral	<b>Central</b>	<b>Central</b>	Peripheral	Peripheral	Peripheral
Care	<b>Central</b>	Peripheral	<b>Central</b>	Peripheral	Peripheral	Peripheral
Cure	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral	Peripheral	Peripheral
Relief	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>
Active substance	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral	Peripheral	Peripheral
Brand	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral	Peripheral	Peripheral
Defined function	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral
Expensive	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral	Peripheral	Peripheral
Taste	<b>Central</b>	Peripheral	Peripheral	Peripheral	Peripheral	Peripheral
Big quantity	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral	Peripheral	Peripheral
Box	<b>Central</b>	<b>Central</b>	<b>Central</b>	<b>Central</b>	Peripheral	Peripheral
Hospital	Peripheral	Peripheral	Peripheral	Peripheral	Peripheral	Peripheral
Central items	15	13	16	5	4	1

Concerning the number of elements in the central core, the more the diploma is high, the less the items are considered as a necessity. The no diploma group has the highest rank with fifteen central words associated to medicine. The product does not have to be covered by

social welfare, associated to a disease, be a constraint, consumed in an abusive way or distributed in hospital to be considered as a medicine. The BEP / CAP group has a similar central core, except that it does not consider the medicine as a danger, a care and it does not have to have an unpleasant taste. But it considers that a medicine is always consumed in an abusive way. The only few elements that the high school certificate group does not consider as representative of medicine are the prescription by the doctor, the covering by social welfare, the unpleasant taste and the distribution in hospital. But we observe an opposite trend from the 2<sup>nd</sup> year of bachelor to the master groups. Indeed; the 2<sup>nd</sup> year of bachelor perceives the medicine in its functional way: it has to be from the research, associated to a symptom, to relieve, to have a defined function and only an element refers to its appearance; sold in a box. The bachelor has the same construction but the necessity of the sell into a box. The Master group has only one item: the medicine has to relieve.

We hypothesized that the highest levels of education should have a better knowledge of medicine than the lowest ones. They should also develop much more elements in their central core. But, there is not a statistically significant difference between the different levels  $F(5,160) = 2.14$   $p > .05$  and  $F(5,160) = 1.026$ ,  $p > .05$ . The other dimensions did not show significant differences.

### Discussion

Since the exploratory study, we saw that the social object medicine is polymorph. Indeed, the participants were very expressive about this term. The difficulty was more about finding a consensus. At every step of the study, it has been felt that the population had an individual link to the medicine products. We regret that we could not develop the discourse of any of those people.

Concerning the elderly, the oldest population has more interest on this social object with a record of sixteen elements in the central core. Older people have very specific central items that the other groups did not share, for example the necessity for the medicine to be covered by social welfare or to have an unpleasant taste. The rising number of central items in regard of age brackets indicates that there is an age effect on the social representation of medicine, probably associated to the consumption.

The legitimacy of medicine use has also its importance as the age bracket is older. We can hypothesize here that this population members, very influenced by doctor's prescription, is not interested in making their own research, which became accessible via Internet and is done by a large part of the whole population. According to the French Medical Association's website, seven out of ten people in France search for medical advices online. The only consensual item for every age bracket is the relief.

About the gender, it can be noted that only the women have central items in the elements presented in the TCI. Again, an explanation could come from the relation between the doctor and the patient. In 1991, women consulted the doctor 9.3 times a year, versus 6.7 times a year for the men (Aïach, 2001). It's 37% more. That means that women may have a close link to medicine due to this consultation frequency. These results tend to accentuate the differences already shown in the literature about the gender discrimination in regard of health.

The level of education shows a reversed tendency compared to age brackets: the lower the diploma is, the higher the number of central items is. Following the observation of Boltanski (1971) we can infer that the higher diploma tend to describe in a better way their symptom; and possibly get rid of it easily, whereas the lower diplomas groups need to mark the whole symbolic relations in order to feel a well-being. Here, the relief is, again, shared by all the groups, but the structure around this sensation helps us to understand that it is not the same perception according to the group: the relief has to come from a symptom and the medicine has to cure for the lower diplomas, whereas for the highest ones, it comes with the knowledge of the processes of fabrication and selling of medicine.

The results of this research tend to verify our hypothesis. We assume that age, gender, and social class have an impact on the social representation structure. Elderly people, women, lower diplomas are the most concerned by medicine. We think that this is closely related to practices.

There is not one, but many medicine's consumers, with many social representations associated. This idea must be shared by the health actors, who contribute to the fabrication, the conception of the boxes, medical instructions, and form of the medicine and also the doctors who prescribe it, the pharmacists... in order to adapt the product to the consumers' representations.

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