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Social Representations, Correspondence Factor Analysis and Characterization Questionnaire: a Methodological Contribution

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The characterization questionnaire is inspired by Q-sort methodologies (i.e. qualitative sorting). It consists in asking participants to give their opinion on a list of items by sorting them into categories depending on their level of characterization of the object. This technique allows us to obtain distributions for each item and each response modality (i.e. characteristic vs. not chosen vs. not characteristic). This contribution intends to analyze these frequencies by means of correspondence factor analysis. The originality of this contribution lies in the fact that this kind of analysis has never been used to process data collected by means of this questionnaire. The procedure will be detailed and exemplified by means of two empirical studies on social representations of the good wine and the good supermarket. The interests of such a contribution will be discussed from both methodological points of view and an applications perspective.
Keywords: social representations, social anchoring, characterization questionnaire, correspondence factor analysis.

El cuestionario de caracterización se inspira en metodologías Q (es decir, clasificación cualitativa). Consiste en pedir a los participantes que den su opinión sobre una lista de artículos, clasificándolos en categorías en función de su nivel de caracterización del objeto. Esta técnica nos permite obtener distribuciones para cada artículo y cada modalidad de respuesta (característico vs. no elegido vs no característico). Esta contribución propone analizar estas frecuencias por medio de análisis factorial de correspondencias. La originalidad de este artículo radica en el hecho de que este tipo de análisis nunca se ha utilizado para procesar datos recogidos mediante este cuestionario. Se detallará y ejemplificará el procedimiento a través de dos estudios empíricos sobre las representaciones sociales del buen vino y el buen supermercado. El interés de dicha contribución será discutido tanto desde el punto de vista metodológico como desde la perspectiva de las aplicaciones.
Palabras clave: representaciones sociales, anclaje social, cuestionario de caracterización, análisis factorial de correspondencias.

We would like to dedicate this article to the memory of Jean-Claude Abric whose death came much too early. He had worked with us on this paper and did not live to see its final form.

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This study takes place in the field of social representations (Moscovici, 2008; Rateau, Moliner, Guimelli, & Abric, 2011). More specifically, the methodological contribution involves a technique used in this field of study and based on a structural approach (Abric, 2001a, 2003). However, our objective does not consist in locating the representational structure but in extending the use of this technique to the study of social anchoring. This contribution proposes to process data obtained by means of a characterization questionnaire, using statistical methodology able to reveal the existence of such social anchoring: correspondence factor analysis (CORR. F. A.). Indeed, while the characterization questionnaire is presented by Abric (2003) as able to give us information on the structural status of the elements forming the field of representation, the CORR. F. A. allows us to highlight social anchoring and therefore to identify ways in which the considered object is regarded according to positions occupied in the social field (Doise, Clémence, & Lorenzi-Cioldi, 1993).

In view of which, our objective is twofold: firstly, it concerns the proposition of an original method for the processing of data collected by means of the characterization questionnaire through the use of correspondence factor analysis (CORR. F. A.). Secondly, via examples related to objects such as the evaluation of wine quality and consumers' expectations about the supermarket, we want to show the relevance of this new way of processing data for applications.

However, before establishing a connection between the characterization questionnaire and the CORR. F. A., we will first describe the methodological procedure. Secondly, from an applied viewpoint, we will give an illustration of the relevance of such a connection. But, foremost, it seems to us essential to introduce them by presenting their theoretical and methodological backgrounds.

The characterization questionnaire

This type of questionnaire (see Abric, 2003; Vergès, 2001) allows us to collect subjective assessments which require a subtle ranking of items more efficiently than traditional questionnaires or attitude scales. From this point of view and an empirical perspective, the characterization questionnaire consists in presenting subjects with a set of *n* proposals, each one concerning a particular content of the social representation under study. We then ask participants to read all the proposals carefully and to evaluate them according to their own representation of the object.

From the viewpoint of the empirical procedure, participants are asked to rank items from the more to the less characteristic. For example, for a 15 item-list, participants have to identify the 5 items, which are the most characteristic of their own way of representing the object. These items are rated "+ 1". Among the 10 remaining items, they select the 5 items that are the least characteristic of their own way of representing the object. These items are rated "-1". Finally, five items remain which are rated "0".

For each item, we obtain a distribution of answers on a 3-point scale. Thus, we can compute an average rank for each item in a given sample. A given item is considered as characteristic of the object when its average rank tends to "+1". Conversely, when the average rank tends to "-1", a given item is considered as being far removed from the social representation of the object shared by the group.

We can also ask the participants to rank items in five categories. For example, they can rank 15 items in five categories, each one containing three items. In this case, for each item, we obtain a distribution of answers on a 5-point scale.

Concerning this questionnaire, several proposals have been made about the processing of data. Abric (2003, pp. 67-68) recommends examining data distributions for each item. It is therefore possible to refer to the data distributions and compare them to these patterns of distributions proposed by the author. For each category of characterization and for each item they reveal the number of participants. This descriptive orientation allows us to identify the most characteristic items which are actually the most consensual.

We can also compute analyses by considering different statistical indexes. This is particularly the case when one is interested in the average rank of each item by computing a mean score. So, we obtain a mean which gives us more options in terms of statistical analyses. Then, we can check the effect of independent variables by computing means comparisons statistical tests.

One can, for example, study mean differences between various groups using the analysis of variance (ANOVA) or even the Student *t*-test. In fact it was through such an analysis that Guimelli (1989) was able to show whether or not social representations of hunting were significantly different, depending on whether the subjects had access to ecological practices. Salesses (2004) also reports an interesting study in which data collected by means of this questionnaire was processed in a different way. The author studied Internet social representations and showed that different representations of this object can exist depending on the level of practice. In addition to processing data by means of the Student *t*-test or ANOVA, she opened an interesting perspective by studying distribution differences using the Kolmogorov-Smirnov test. This enabled her to show that variations in the representation were dependent on the maintained level of practice towards the object.

These analyses are undoubtedly relevant for highlighting relations between the different items. Indeed, using the "D" (i.e. distance) index proposed by Guimelli (1998, pp.172-185), it is possible to carry out an analysis of similarity (Flament, 1981). Moreover, we can identify the social anchorings (Doise, 1992; Doise et al., 1993; Doise, 2002; Spini & Doise, 1998) which are able to reveal the existence

of the social regulations involved in the ways of representing a given object as demonstrated by the work of Guimelli (1989, 1998) and Salesses (2004). Nevertheless, in the latter case, it is clear that several analyses are required to reveal these aspects. We should also add, in this connection, that the social anchorings highlighted in the above mentioned works were assumed by the authors and were related to the problematic of the research which outlined well-defined hypotheses. However, in the case of exploratory research we would be forced to proceed to several analyses to reveal a variable which can indicate the existence of a social anchoring.

We remember that from a descriptive viewpoint, the characterization questionnaire allows us to obtain a distribution for each item according for example to the three following response modalities: "very little characteristic" vs. "not selected" vs. "very characteristic". The number of participants for each modality of answer represents a categorical dependent variable and allows, when independent variables are of the same nature, to use the Khi²-test and therefore the CORR. F. A., which is based on this statistics test. Thus, by its capacity to establish correspondences between the characterization's response modalities and the various groups that could compose a given sample, we considered the CORR. F. A. as able to reveal social anchoring which regulates the differentiated ways of representing the object.

Firstly, we will present the empirical procedure to be followed in order to compute this new way of analyzing data collected by means of the characterization questionnaire. Secondly, we will illustrate this new data processing by presenting two empirical studies on "good wine" quality cues and consumer expectations related to the "good supermarket".

The correspondence factor analysis (CORR. F. A.)

The CORR. F. A. can be included amongst exploratory statistical methods that according to Deschamps (2003, p.180) *"are useful for summarizing a set of data"*. This method is rooted in the CORR. F. A. theory developed by Benzécri (1976), and allows the identification of the most significant factorial axes. Exploratory statistical methods are grouped under the name "data analysis" and have the same objective: to provide a special structure that renders most of the information while reducing the mass of data. From this viewpoint the CORR. F. A. is similar to the principal component analysis (PCA), which is often used in this purpose. However, the use of the CORR. F. A. is more fitted to the processing of data obtained by characterization questionnaires than the principal component analysis. Indeed, in this specific case, PCA generates systematic oppositions on the factors that interfere with the interpretation of the results. More precisely, such a result is the consequence of the characterization technique in itself, as it consists in realizing independent, exclusive and opposite groups of items. Therefore, the use of the PCA to process this kind of data would lead to results that correspond more to a statistical artifact.

According to Deschamps (2003, pp. 179-180), the CORR. F. A. "allows us to simultaneously compute what can be considered as independent variables (whether they are invoked or caused) and lexical productions of our participants" (see also Oliveira & Amaral, 2007). This represents a key point especially when one wants to study the effect of social anchoring on the organization of a given representational field.

This method is therefore relevant with regard to the processing of data characterized by frequencies, which is the case, for example, with data obtained by the procedure of verbal associations. In the field of social representations, an important number of studies[1] were conducted on content of this nature (e.g., Deschamps, 2003; Guimelli & Deschamps, 2000; Lo Monaco & Guimelli, 2008). However, although the characterization questionnaire provides frequencies data, the CORR. F. A. has never been considered for processing data collected by means of this questionnaire. On the same basis, cluster analysis, which is also suitable for the processing of frequencies data would have been able to be considered. However, such an analysis can only consider one independent variable at a time and requires additional analysis in order to establish correspondences. In this way, the CORR. F. A. can be considered as more efficient. Moreover, the nature of the data also excludes the possibility of using the multidimensional scaling (MDS) as this analysis is based on the processing of means. Consequently, despite its strong accuracy (Doise et al., 1993; Clémence, 2003; Spini, 2002), this kind of analysis would lead to a loss of information in the case of data obtained by characterization questionnaires.

Hence this contribution proposes to illustrate the advantages of using the CORR. F. A., but also how to produce such an analysis. Indeed, we have just seen that the CORR. F. A. could constitute an appropriate method of data analysis for the processing of lexical data collected by means of verbal association procedures. We also saw that the CORR. F. A. is applicable when both independent and dependent variables are categorical in nature. However, Abric (2003) emphasizes the fact that results from characterization questionnaires can be highlighted by examining three patterns of distributions. For each pattern, we find the number of participants for each response modality ("very little characteristic" vs. "not selected" vs.

[1] Doise, Clémence and Lorenzi-Cioldi (1993) and Deschamps (2003) propose a presentation of CFA in the framework of the study of social representations.

"very characteristic"). In connection with these distributions, it is possible to ascertain, for each item, how many people have indicated a given item as the most characteristic, or less characteristic or even how many people have not chosen it. In this way we can obtain a contingency table (the Burt table, see below) with on the one hand, in rows, the different items characterized by the three response modalities, and on the other hand, in columns, the modalities of the independent variables. Finally, the number of participants is given at each intersection of rows and columns.

Thus, the number of observations submitted to analysis is always equal to:

N(items)*N*(modalities of response).

The construction of a specific table in which the characterization items and the independent variables are in columns and the subjects in rows is then necessary to edit the Burt table (i.e. a contingency table). Therefore, from this table it is possible to edit the Burt table that will help to achieve the CORR. F. A.

Once the Burt table has been produced, the processing of data as well as the CORR. F. A. decision criteria are identical to those proposed in the literature[2]. To decide if a term or an observation contributes to the definition of one or more factors, we refer to the proposals made by Deschamps (2003) concerning the contributions by factor (CF). According to the author, we consider that a term or an observation participates in the constitution of the factor if its contribution is greater than the average contribution[3] respectively for the modalities of variables and the observations submitted to analysis.

In connection with data collected from the characterization questionnaire, the use of the CORR. F. A. offers the advantage of revealing the variables which are most strongly associated with a particular modality of response about an item. This approach therefore highlights social anchoring (see Doise, 1992; Doise et al., 1993) and thus proves very useful with regard to understanding how the object is represented in relation to social categories. Until now, we have seen that such an analysis has not been envisaged for the treatment of data collected by means of the characterization questionnaire. Nevertheless, it is clear that attempts in this direction have been undertaken. Remember, Salesses (2004) established a comparison of distributions from the Kolmogorov-Smirnov test based on levels of practices maintained in relation to the Internet. One thinks also of Guimelli (1989) who used the Student t-test for this purpose. And finally, Abric (2003) proposed distribution patterns to establish the existence of subgroups.

The CORR. F. A. takes into account all these points and at the same time, allows not only the identification of subgroups, but also reveals the items and the variables which organize the data. This could be useful both in exploratory and experimental perspectives. Moreover, the three or more modalities indicating the level of salience of the item in the representational field (e.g., "very little characteristic" vs. "not selected" vs. "very characteristic") provides additional information on the nature of the content which differentiate populations.

In short, CORR. F. A. reveals social anchoring and provides information in terms of representations in the identified subgroups. To illustrate the relevance of this methodological contribution we decided to report two examples concerning two objects related to consumer studies. These were the "good supermarket" and the "good wine". The characterization technique was used to collect the data in connection with these two objects. Note that in each research, a preliminary study was conducted with a free association task, but to be as brief as possible we decided not to report these results because they did not concern directly what we had to show within the framework of this contribution. Thus, firstly and for each one of the objects under study, we identified a corpus of quality cues for the good wine as well as a corpus of characteristics of the good supermarket. Secondly, we applied the method proposed in this contribution. Consequently, a first sample of consumers was questioned about the "good wine" quality cues. A second sample was questioned about the characteristics of the "good supermarket". For each object, the questionnaire included fifteen items.

Method

Participants

Concerning the study carried out on the "good wine", 100 consumers of wine (mean age = 41.51; *SD* = 13.83) were interviewed in wine sections of supermarkets in the south of France. The sample was composed of 55 men and 45 women. Despite the constraints encountered, we tried to have a balanced distribution of participants in terms of socioprofessional categories (SPC) between a lower one (SPC-; *N* = 54) and a higher one (SPC+; *N* = 46). Note that we divided the population concerning this criterion by

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[2] See Deschamps (2003) for a detailed presentation of the CORR. F. A. and decision criteria concerning the contribution of both modalities of variables and observation to the construction of the factors.

[3] In the Statistica package software the sum of the CF is equal to 1 and corresponds to 100%. In fact, if two variables modalities contributed as much to the definition of the factor, they would obtain each one the value of .50, thus 50%. We obtain the average contribution following this way: "1/number of modalities" for the variables and "1/number of observations" for the observations.

referring to the grid of the French National Institute for Statistics and Economic Studies (see Desrosières & Thévenot, 1988). Furthermore, in order to have at our disposal an additional independent variable and not to limit our study to only one category of wine, the participants were divided into two categories. Fifty participants were questioned about the "good red wine", and the fifty remaining about the "good rosé wine".

Concerning the study carried out on the "good supermarket", 128 participants (mean age = 41.07; *SD* = 12.95) were interviewed in a town center in the south of France. They were not asked to complete the questionnaire near supermarkets to avoid a spontaneous reference to the name of a specific supermarket chain. Identically to the first study on the "good wine", we balanced the distribution between men (*N* = 64) and women (*N* = 64). The SPC distribution was also balanced between the lower one (SPC-; *N* = 64) and higher one (SPC+; *N* = 64). The participants were also asked whether (*N* = 70) or not (*N* = 58) they had children. Age was taken into account and split among four categories: 20-29 years old (*N* = 32); 30-39 years old (*N* = 32); 40-49 years old (*N* = 32) and finally 50 years old and over (*N* = 32).

Material and procedure

Apart from the place of recruitment of participants, the procedure was strictly identical in both cases. Respondents were invited to take part in a survey. From a methodological viewpoint, we used the characterization technique. This questionnaire consisted of fifteen criteria chosen among the most frequent and important participants' free associations collected during the preliminary study. With regard to the empirical procedure, it should be remembered, that this questionnaire required participants to sort a list of items (i.e., fifteen quality cues in the case of the "good wine"; fifteen characteristics/expectations in the case of the "good supermarket"). Firstly, we asked the participants to choose the five that they felt were the most important for choosing a good wine (good red wine, good rosé wine depending on the condition) or to describe a "good supermarket". Secondly, they had to indicate the five they considered as being the least important. Finally, five indicators remained because they were not chosen as "most important" or "least important". Finally, they had to fill out a document allowing certain socio-demographic criteria and the level of practice with regard to the object to be checked. For each participant, we have encoded "1" the five items considered as most important or most characteristic, "-1" the five items as least important or least characteristic, and finally, '0' the five remaining items.

Results

Results regarding the "good wine"

We used the CORR. F. A. to study the relevant correspondences between our observations (i.e., frequencies for each response modality and, for each item) and modalities of the mobilized independent variables. Analysis revealed two factors which accounted for 87.24% of total inertia (Factor 1 = 64.08%; Factor 2 = 23.16%). Factor 1 consisted of "Gender" and "SPC" variables whereas Factor 2 received the contribution of the "questionnaire type" variable (i.e. "good red wine" vs. "good rosé wine"). To decide if a variable or an observation contributes to the definition of one or more factors, CF were computed (Deschamps, 2003). According to Deschamps' recommendations, one may consider that a model fits the factor definition if its contribution is higher than the average contribution of the variables introduced into the analysis. In our case, Factor 1 received a major contribution from the "Gender" variable: AFC (men) =.17 + AFC (women) =.31 and the "SPC" variable: AFC (SPC+) =.16[4] + AFC (SPC-) =.19. Thus, the total contribution of these two variables in the definition of this factor is equal to .83 (i.e. 83%). Concerning the Factor 2, we noted a contribution of the "questionnaire type" variable: AFC (good red wine) = .42 + AFC (good rosé wine) = .42. Thus, the total contribution of this variable in the definition of this factor is equal to .84 (i.e. 84%). Considering these contributions, we could refer to Figure 1 to see how these variables and quality cues were organized.

As we can see on the Figure 1, the CORR. F. A. offers the possibility to have a simple and synthetic view of the results. Participants' responses seemed to be strongly linked to their socioprofessional position and to their gender (i.e. Factor 1). We noted that SPC+ and men focused their choice of quality cues more on knowledge (e.g. "prior knowledge"; "grapes"; "year" and "fame" are regarded as important for evaluating the quality of a wine) than SPC- and women. Then, men and SPC+ rejected aesthetic cues more frequently (e.g. "label") and those which reflected a lack of knowledge (e.g. "price"), than SPC- and women. These results suggested the existence of a more important perceived level of expertise among men and SPC+ than among women and SPC-. Moreover, marketing literature acquaints us of the fact that these criteria allow consumers to develop expectations in relation to the product and that they are used differently depending on the consumers' position in society (Darwar & Parker, 1994; Jacoby, Olson, & haddock, 1971; Zeithaml, 1988). We also confirm the opposition between intrinsic vs. extrinsic cues (Charters & Pettigrew, 2007; Verdù Jover, Lloréns Montes, & del Mar Fuentes Fuentes, 2004). The

[4] Note that the average contribution is equal in this case to .17 (thus, 17%). However, this modality is enough relevant to be conserved despite its difference of 1% from the average contribution.

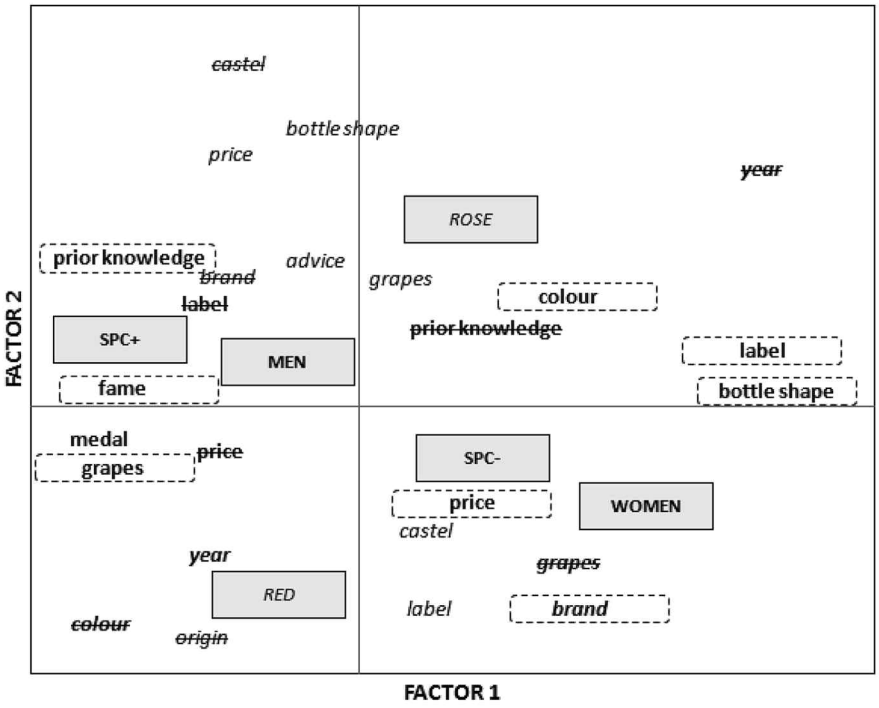

Figure 1. Graphical representation of the results from correspondence factor analysis (factors 1 and 2).
Note: It is important to read the figure following these instructions:
Abbreviations in capital letters which are inside grey frames represent the terms of independent variables
"**TERM**" means that the term of independent variables accounts for the construction of Factor 1
"*TERM*" means that the term of independent variables accounts for the construction of Factor 2
"**Item**" means that the item accounts for the construction of Factor 1
"*Item*" means that the item accounts for the construction of Factor 2
"**Item**" means that the item accounts for the construction of Factors 1 and 2
Items which are inside dotted frames represent the items which are considered as very important
Crossed-out items represent the items which are not considered as important
Items which are neither inside dotted frames nor crossed-out represent the items which are considered neither as important nor as not important.

first ones refer to the physical part of the product which cannot be changed without changing the product itself. Indeed, a change concerning an intrinsic characteristic would result in a change concerning the product as a whole (Olson, 1977). The second ones, by contrast, are directly linked to the product, but are not physically part of it (Olson, 1977). They are developed following marketing strategies. In reference to the collected data, it seemed that men and SPC+ felt themselves to be more expert (according to their perception) than women and SPC-. In fact, in accordance with the literature, the first ones mobilized preferentially intrinsic attributes (Maheswaran, 1994) referring to knowledge of the product. Inversely, the second ones seemed to be more concerned about extrinsic criteria and more seduced by packaging.

Furthermore, the extrinsic criteria referred to the aesthetic dimension and marketing (e.g. "bottle shape"; "label"; "colour"; "brand") and were often more regarded as important by women and SPC- than by men and SPC+. These cues also reflected a lack of confidence in the choice (e.g. price is considered important). In addition, women and SPC- considered as less important the criteria that related to knowledge of the product and its technical aspects (e.g. "prior knowledge", "grapes", "year") compared to men and SPC+. To summarize, if men and SPC+ were looking for a "good wine", women and SPC- were more interested in buying a "nice bottle of wine".

Concerning Factor 2, the organization allowed conclusions based on the type of questionnaire offered to the participants. The same criteria were not used for judging the quality of good red and good rosé wines. For example, for the good rosé wine, the year cue was rejected and the brand cue was designated as important by the people who answered the good red wine questionnaire. Note that no cue is preferentially considered as important in frequency between these two types of wine; their distinction was more decided on the basis of the cues selected and considered as significant.

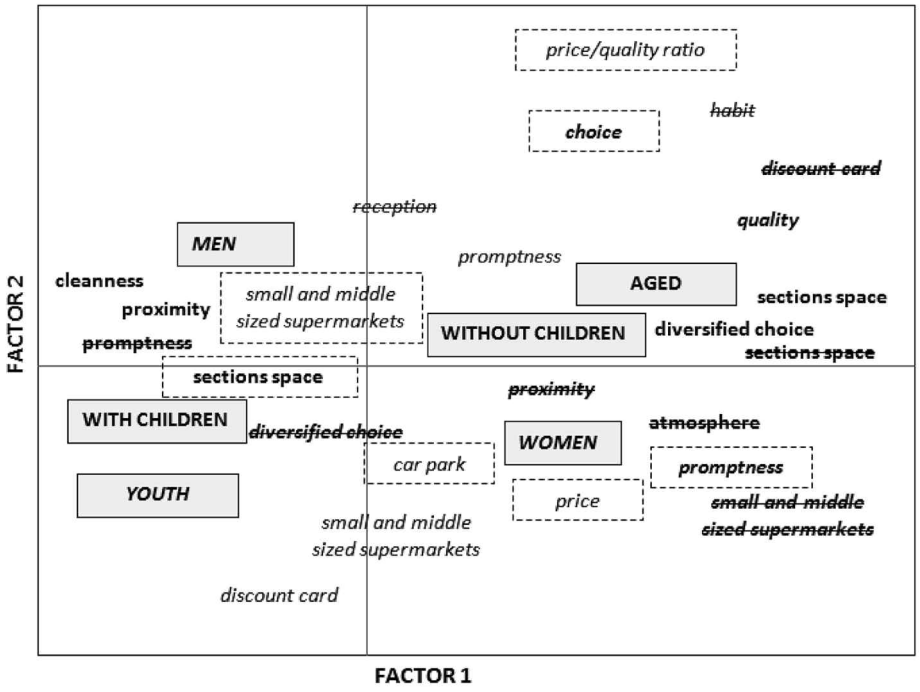

Figure 2. Graphical representation of the results from correspondence factor analysis (factors 1 and 2).
Note: It is important to read the figure following these instructions:
Abbreviations in capital letters which are inside grey frames represent the terms of independent variables
"**TERM**" means that the term of independent variables accounts for the construction of Factor 1
"*TERM*" means that the term of independent variables accounts for the construction of Factor 2
"**Item**" means that the item accounts for the construction of Factor 1
"*Item*" means that the item accounts for the construction of Factor 2
"Item" means that the item accounts for the construction of Factors 1 and 2
Items which are inside dotted frames represent the items which are considered as very important
Crossed-out items represent the items which are not considered as important
Items which are neither inside dotted frames nor crossed-out represent the items which are considered neither as important nor as not important.

Results regarding the good supermarket

CORR. F. A. revealed two factors which accounted for 67.69% of the total inertia (Factor 1 = 41.57%; Factor 2 = 26.12%). We observed both in Factors 1 and 2 a contribution of the "gender" variable which contrasted "men vs. women" modalities and of the "age" variable represented by the "20-29 years old" modality. Then, concerning Factor 1, there were contributions of the "child" variable which contrasted "without children" vs. "with children" and the "age" variable represented by the modality "50 years old and more". We did not find other contributions exceeding the threshold in terms of average CF neither of the "SPC" variable nor of the "30-39 years old" and "40-49 years old" modalities of the "age" variable. In terms of CF, Factor 1 received the following contributions: AFC (men) = .11 + AFC (women) = +.11 + AFC (20-29 years old) = .15 + AFC (50 years old and over) = .25 + AFC (without children) = .13 + AFC (with children) =. 10. Thus, the total contribution in the definition of this factor is equal to .85 (i.e. 85%). Factor 2, received the following contribution: AFC (men) =.25 + AFC (women) = .25 + AFC (20-29 years old) = .18. Thus, the total contribution to the definition of this factor is equal to .68 (i.e. 68%).

Considering these contributions, we can refer to Figure 2 to see how these variables and characteristics/expectations were organized.

By showing that the gender, the age and the fact of having children (or not) leads to significantly different characterization choices, results clearly revealed that expectations expressed towards supermarkets were socially constructed and regulated. The analysis showed the importance of the contrast between men and women. We should note that such a contrast could have been found with an ANOVA but it would have required a specific hypothesis focused on the impact of the gender. Nevertheless, here, the CORR. F. A. allows us to find such a contrast without any previous hypothesis. This underlines the exploratory function

of the CORR. F. A. that could lead to discover an unexpected impact of a given independent variable and show how it organizes the representation that is studied. Thus, the "gender" variable operated as social anchoring in the way of representing this object. More precisely, women's expectations reflected a more intensive practice of this task. Expectations considered as very characteristic by women (i.e., frames with dotted lines, see Figure 2) were more pragmatic than those of men. Furthermore, women seemed to be more concerned about some aspects of products sold by supermarkets while men appeared to be more interested in the environment of the store and its practical aspects. Age also played an important role in the social regulations of the expectations related to this object. Most young people (i.e. 20-29 years old) did not actually have particular expectations, the question of choice was not decisive compared with the older population (i.e. 50 years old and over). For young people and for men, whose profiles were very similar, this seemed to translate into a very distant relationship with the object, characterized by low levels of involvement, knowledge and practice (see Abric, 2001b; Dany & Abric, 2007). Finally the question of children appeared to be decisive and joined the idea of the distinction between internal environment store expectations, its size, the arrangement of its sections and therefore its functional aspects and its practical dimension. Such expectations demonstrated a motivation not to put up with the store. Furthermore, expectations in terms of ease and accessibility (i.e. parking) or perceived benefits (i.e. price/quality ratio), return the idea of a desire to optimize the time spent on this activity (i.e. shopping by buying good products in limited time and with a minimum level of constraint). Given the organization of the expectations and the variables, it seemed that men and young people expected a practical store paying little attention to products, while women and older people were waiting for an "optimal" store combining quality, competitive prices and high practicality.

Discussion

As we have just illustrated, processing data from a characterization questionnaire by means of CORR. F. A. improves the analysis of the object under study. Indeed, it provides information about the relationships existing between the items with the terms of the independent variables used in the analysis. In this context, the different profiles of answers (i.e. item as characteristic vs. not chosen vs. not characteristic) provided by the characterization questionnaire procedure allowed us to identify the "chosen vs. not chosen vs. rejected" items by individuals. At this level, the CORR. F. A. can distinguish the contribution of the various variables in the construction of the factors and reveals the existing social regulations which are responsible for the different ways of representing the object.

Concerning an object such as wine and its quality cues, the use of this methodology allowed us to highlight the effects of gender, socio-economic level and the type of wine on the quality cues used by respondents to evaluate a wine as a good wine. Such effects reflected different ways of representing the object, which are particularly likely to be expressed in practice (Guimelli, 1994; Lo Monaco & Guimelli, 2008). Indeed, according to the results obtained for example on the representation of the supermarket, it appears that men's expectations are focused on stores' environments and practical aspects and those of women on the products sold. In connection with the social representation theory, according to Moscovici (2008) social representations guide practices, so the observed difference at a representational level should be observed at a behavioral level. Thus, men, for example, would prefer supermarkets close to their home while women's preference would be to visit supermarkets offering a wide selection of products. From an applied perspective these results are therefore useful when we have to implement a managerial strategy or as in our example, identify the expectations of various populations. In addition, the conditions of application of this methodology focus essentially on the nature of the mobilized variables and allow the study of any object when this methodological condition is fulfilled. Thus, the similar study presented in the second example which concerned the representation of supermarkets argues in favor of the wide application of this methodology. In this example, the information obtained also shows that the representation of the same object may vary from one sub-group to another. However, the main difference between this example and the first one consists in the fact that we had no specific hypotheses concerning the social anchoring that underlies different ways of representing the object. The use of this methodology that we have presented therefore allowed us to identify social anchoring that the literature (see Abric, 2003; Guimelli, 1989, 1998; Salesses, 2004) on the subject had not reported up to that point. It therefore illustrates the double interest in processing the characterization questionnaire data by means of the CORR. F. A.: firstly, a confirmatory interest in the sense that this methodology is used to confirm the existence of established social anchoring, and secondly, an exploratory interest as it is possible to identify the factors at play in social regulations in ways that objects under study are regarded. However, we note the existence of two limitations in relation to this contribution. The first relates to the fact that the analysis produced considers the independent variables but does not take into account their crossings and their potential effects. Nevertheless, it would be desirable when hypotheses allow, to consider these crossings in order to study these phenomena more accurately. In this context, various methodologies allow us to study such crossings (see Guttman Effect; Flament & Milland, 2003, 2005, 2010; Gaymard, 2006; Lo Monaco & Guimelli, 2011). However, this analysis could not be performed because it requires a much larger sample.

Beyond this first limit, from which we were able to provide some elements of answers, we also note that, despite that the fact that the characterization questionnaire initially provides identification of the structural status of the representational elements (Abric, 2003), the use of this methodology in this context, presents a problem of reliability related to the nature of the questioning when the existence of different subgroups is assumed (Vergès, 2001). Consequently, the location of social anchorings by means of CORR. F. A. should be complemented by a centrality measure in the different subgroups identified. Such a methodological triangulation (cf. Apostolidis, 2003) would be able to help us to highlight, with certainty, the representational structure for each different subgroup identified. However, beyond a triangulation which presents the disadvantage of requiring several surveys, an alternative solution could consist of processing data by the "calling-into-question" technique (Moliner, 1989, 1994), or by means of the test of context independence (Lo Monaco, Lheureux, & Halimi-Falkowicz, 2008), or even the basis cognitive schemes model (Guimelli, 2003; Guimelli & Rouquette, 1992; Rouquette & Rateau, 1998). Indeed, the data resulting from these tests which are able to highlight the structural status of a representational element (central vs. peripheral), have the advantage of allowing the creation of dependent variables whose terms would correspond to the acceptance or rejection of various elements as being part of the central core of a given representation endorsing the use of the CORR. F. A. Such a methodology would then allow the formulation of reliable hypotheses about the structural status of a representational element in the different subgroups. The development of such a processing data will be the object of our future research.

In conclusion, it appears that the integrative perspective of the multiple treatments usually carried out in parallel, would allow us to foresee new opportunities for research by means of the characterization questionnaire and more broadly speaking, different methods of studying social representations. In addition, this data processing method will be very useful in the framework of research which focuses on the impact of social regulations on how individuals and groups regard the object under study. Thus, this methodology paves the way for multiple applications in several fields of application, such as consumer psychology and studies of images, as evidenced by the presented empirical illustrations, but also in health psychology and environment psychology.

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