

## **Beliefs about Internet: Methods of Elicitation and Measurement**

**Dora Capozza**  
**Rossella Falvo**  
**Egidio Robusto**  
**Annalisa Orlando**

Dipartimento di Psicologia Generale  
Via Venezia 8  
35131 Padova  
Italy  
E-mail: [dora.capozza@unipd.it](mailto:dora.capozza@unipd.it)

In this study new methods were proposed to elicit and measure the components of a social representation. To elicit the representation field – the structure of the beliefs relative to the object – we applied the laddering technique, devised by Bagozzi and Edwards (1998) to measure cognitive schemas. The use of indices, proposed in network literature (see, e.g., Faust & Wasserman, 1992), allowed us to measure salient features of the cognitive structure (the level of Abstractness, Prestige and Centrality for the elements). We also proposed a method, based on factor analysis of the individual implication matrices, to define whether the representation is shared in the examined group. Finally, multiple regression was applied to test the dependence of attitude on the elements of the representation field. As an object of representation the use of Internet was considered.

### **Introduction**

#### **The concept of social representation**

The aim of this study is methodological; our intention is to propose methods aimed at eliciting social representations and measuring their components. As an object of representation

we considered Internet and its use, given the wide diffusion of this technology in modern society.

Social representations are systems of values, ideas, knowledge and practices which are formed through ordinary communication, that is, immediate conversation or conversation mediated by mass media (Moscovici, 1961/1976, 1981, 1984). These have a two-fold function: they enable individuals to orient themselves and master their material and social world; they facilitate communication by providing members of a community with a shared code which allows them to interpret the various aspects of their world and to understand their individual and collective history. The term 'social' indicates that the representations are the outcome of a permanent dialogue and that they are constructed and transformed in the flow of personal interactions (Moscovici, 1961/1976, 1984). Moreover, they are shared images: consensus also derives from the fact that in making familiar the unfamiliar the members of a community refer to pre-existing shared beliefs (anchoring process, see also Jodelet, 1984, 1989).

Moscovici (1961/1976) identifies three components in social representations: information, namely, the combination of opinions and knowledge concerning the object; the field of representation, that is, the structure of the relations amongst these opinions and knowledge; attitude, namely, the affective disposition, positive or negative, towards the object (see Le Bouedec, 1984 and, for the elicitation of the three components, Capozza, Robusto & Busetto, 1999; Capozza, Robusto, Squarza & De Carlo, 1995; Galli & Nigro, 1992; a salient work which proposes methods for measuring social representations is Doise, Clémence & Lorenzi-Cioldi, 1993). Even though the approach of social representations is different from that of 'social cognition' (see, e.g., Bonnes, 1999; Moscovici & Markova, 1998), the 'social cognition' concept of cognitive schema is close to that of field of representation. This affinity, as we will see, allows methods proposed in the cognitive approach to be applied to assess components and attributes of social representations.

The cognitive schema is the structure of the knowledge, ideas and values which are linked to the object (Fiske & Taylor, 1991). When the object is a technology and its use, as for Internet, the basic units of the schema are the beliefs regarding the goals which the object allows to achieve, where goal is intended as the representation of an end towards which the action is directed (Pervin, 1989, p. 474). Anderson (1983) termed these units 'declarative knowledge' Bagozzi and Edwards (1998, p. 607) hypothesize that, in the cognitive schema, goals are organized in a hierarchical system. At the bottom there are the most concrete goals, such as 'allows me to travel' for the object-money; at the top there are the most abstract goals, such as 'allows self-fulfilment'. Goals in the middle channel the effects of the more concrete goals onto the more abstract ones; it could be claimed, for example, that travelling leads to feeling fulfilled, because it enriches knowledge and experiences (intermediate goal). The relationships between the goals have been defined 'procedural knowledge' (Anderson, 1983). These are 'if-then' propositions, such as 'if when travelling people have manifold experiences, they will feel personally fulfilled'. The cognitive schema allows people to interpret new information and to make inferences which go beyond the data available.

To elicit the schemas, Bagozzi and collaborators (see, e.g., Bagozzi & Dabholkar, 1996; Bagozzi & Edwards, 1998) proposed a technique defined 'laddering technique'. The respondent is asked to supply reasons for pursuing a particular goal (e.g., to stop smoking) or for being in favour of a technology (e.g., the use of Internet). He/she is asked, then, to explain why these reasons are important to him/her. In the final phase, the respondent is solicited to justify the last explanations supplied. For each respondent, therefore, an idiographic matrix is obtained. On the basis of the principles of network analysis (see, e.g., Faust & Wasserman, 1992; Freeman, 1979), a hierarchical structure is constructed; this reproduces the cognitive schema and includes the goals which can be achieved through the act and the relationships (linkages) between these

goals. Through multiple regression, moreover, it is possible to detect the existing connection between cognitive structure and attitude, that is, the determining effect that goals and linkages have on attitude. When the object of a representation is a person (e.g., president Clinton, in the study by Bagozzi & Dabholkar, 1996) or an institution (a political party; United Europe), the units of the schema are: the beliefs regarding the attributes of the object, and the values which the object allows to be realized, if one is favourable to it; the values which the object hinders, if one is contrary to it.

### **Aims of the study**

As already stated, the aim of this study, which considers Internet as an object of representation, is methodological. Our intention is, in fact, to test the efficacy of new methods in detecting the components of a representation. In particular, given the close affinity between the concept of schema and that of field of representation, to assess the latter the technique proposed by Bagozzi for the schemas will be used (laddering technique; see Bagozzi & Edwards, 1998). Moreover, a procedure will be applied to establish whether the field of representation is shared in the group of respondents considered. Finally, by use of multiple and stepwise regression we will uncover the connection which exists between field of representation and attitude, this latter measured with semantic differential scales (see, e.g., Capozza, Robusto & Busetto, 1999); we will, that is, assess which cognitive elements (beliefs regarding goals and relationships between goals) influence the affective disposition (attitude) towards Internet. Concerning the component information (beliefs and knowledge regarding the object), this will be elicited by using the laddering technique. In the procedure which we propose, therefore, respondents spontaneously express their beliefs and are not forced to choose from a range of possibilities established beforehand by the researcher. Prefixing the beliefs may have as a consequence the elicitation of a structure, which does not fully reproduce the field of representation.

## **Method**

### **Participants**

Eighty students attending the Faculty of Psychology at Padova University participated in the study, all Internet users to a different extent and favourable to its use. Respondents, 20 males and 60 females (mean age 23.11), were approached by the researcher at the end of a lesson. Participation in the study was voluntary; the test was individual. Data were collected in May 1999.

### **Instrument**

A questionnaire was used which included 1. an idiographic matrix to elicit: the beliefs concerning the goals which can be achieved through the use of Internet; the relations between these goals; 2. semantic differential scales to measure attitude.

*Idiographic matrix.* In the first part of the questionnaire a grid was presented composed of 12 boxes: three columns of four boxes. In the instructions the participant was told that he/she had to list four reasons for his/her being in favour of Internet, writing them in the first column entitled 'Reasons'. Next, he/she was instructed to consider the first reason provided and to write why it was important to him/her; the reply was written in the first box of the second column entitled 'Why-1'. Finally, the participant had to justify the explanation given in 'Why-1', that is, he/she had to indicate why the reason supplied in 'Why-1' was important to him/her. The reply

was written in the first box of the third column entitled 'Why-2'. The task was repeated for the other three reasons. Each respondent could, therefore, express a maximum of twelve reasons for being in favour of Internet, corresponding to the goals which can be achieved through its use, and eight linkages between goals. In the studies carried out by Bagozzi and collaborators (e.g., Bagozzi & Edwards, 1998), the idiographic matrix is more complex, organized into five rows and three columns. We simplified it to make the respondents' task easier.

*Attitude.* Although attitude is, generally, conceptualised as one-dimensional (see, e.g., Ajzen, 1996; see also Moscovici, 1961/1976), it is possible to distinguish two components: the evaluative component and the affective one. Recent studies have proved the validity of this distinction (see, e.g., Ajzen & Driver, 1991; Bagozzi, Lee & Van Loo, 2001; Capozza, Cesco, Dazzi, Voci & Martines, 1999; Crites, Fabrigar & Petty, 1994; Trafimow & Sheeran, 1998). It has, therefore, been hypothesized that also attitude towards Internet is organized in a two-dimensional configuration. To measure the affective component we chose the scales: pleasant/unpleasant, beautiful/ugly, agreeable/disagreeable; to measure the evaluative component: beneficial/harmful, wise/foolish, useful/useless. The concept was: My use of Internet; on the seven-point scale, 1 was given to the negative and 7 to the positive pole. The response alternatives contained the following words: 'very', 'quite', 'slightly', 'neither', 'slightly', 'quite', 'very'.

## Results

### The field of representation

Two judges, who knew the aims of the study, analysed the responses concerning the idiographic matrices. Beliefs were identified regarding the goals which can be achieved using Internet. The two coders classified the goals into 10 categories. The category Greater social relations includes for instance [Internet allows people]: 'new friendships'; 'better social relations' (e.g., 'to communicate with friends who are far away'). Disagreements were resolved by discussion. The 10 categories are reported in Table 1.

The next step was to detect the structure of the linkages existing amongst goals. A 10 order squared matrix ( $F$ ) was constructed, defined implication matrix. In this, each element  $f_{ij}$  corresponds to the number of times respondents proposed the goal  $i$  as the source of the goal  $j$  (Table 2). The relation, for example, Rapid and extended communication which leads to Greater social relations was mentioned with frequency:  $f_{ij} = 33$ . In the matrix, for each goal, two measures are reported: 'in degrees' and 'out degrees'. The first indicates how often a goal is an end in the relations amongst goals, 'out degrees' indicates how often a goal is a means. With these two measures, for each goal, the index of abstractness can be computed, that is, the ratio of 'in degrees' to the sum of 'in degrees' plus 'out degrees'. The higher the abstractness ratio (range from 0 to 1), the more the goal is an end rather than a means through which other ends can be achieved.

On the basis of the implication matrix a representation of the hierarchical goal structure can be constructed. To this end, it is necessary to choose a cut-off level, namely, to follow a criterion to select the linkages. We chose to consider the linkages named by at least five per cent, that is, by four or more participants.<sup>1</sup> Using this procedure, 23 out of the 51 linkages

---

<sup>1</sup> Using this cut-off criterion, the number of linkages is reduced to 45 per cent of those with a frequency equal to or greater than 1. Moreover, the sum of the frequencies regarding the linkages chosen corresponds to 86 per cent, namely to a high portion, of the sum of all the frequencies of the implication matrix (Table 2).

**Table 1**  
Categories of goals which can be achieved through Internet

1. RAPID AND EXTENDED COMMUNICATION <i>Rapid communication</i> Extended communication Useful communication	6. KEEPING UP WITH MODERN TIMES <i>Keeping up with modern times</i> Feeling integrated in today's society Adapting to social standards
2. RECENT AND RAPID INFORMATION <i>Recent information</i> Rapid information Difficult to obtain information	7. DEMOCRACY <i>Democracy</i>
3. GREATER SOCIAL RELATIONS <i>Better social relations</i> New friendships	8. SELF-EXPRESSION <i>Self-expression</i> Satisfying personal interests
4. AMUSEMENT <i>Amusement</i> Stimulates imagination Pastime	9. PROFESSIONAL SELF-EXPRESSION <i>Professional expression</i> Efficiency at work Efficiency in studying
5. INCREASE IN PERSONAL KNOWLEDGE <i>Deepening personal culture</i> Up-dating personal knowledge Knowing different cultures	10. BETTER QUALITY OF LIFE <i>Quality of life</i> Makes everyday life easier Saving time Psychological well-being

*Note:* The goals in italics represent the most frequently named goal in the category.

quoted by at least one respondent were selected; moreover, the goal Democracy was eliminated because it was involved in linkages mentioned by less than four respondents. Figure 1 presents the structure of the relations amongst the goals. It was obtained by considering the linkages selected; the frequency of each linkage is taken from Table 2. In the figure, the placement of the goals along the vertical axis is based on the abstractness ratio; the arrows indicate the direction of the linkages: in general, from the more concrete goals to the more abstract ones.

It is interesting to know the means-end relations which may lead to being in favour of Internet. To quote a few: Internet promotes a rapid and extended communication, allowing people to make use of recent information and improve their quality of life; it is fun to use Internet, therefore, it improves quality of life; Internet widens social relations, thus improving quality of life; the up to date information and greater knowledge which Internet allows favour personal and professional self-expression, thus improving quality of life. Also the most abstract goal, Better quality of life, is considered a means, as well as an end; it allows a person: to widen knowledge, deepen personal relations, be professionally more efficient (reciprocal feedback loops).

To assess the importance of the single goals in the mental representation, apart from the abstractness ratio, the indices of Prestige and Centrality are used. The Prestige index is equal to the ratio of "in degrees" (number of times in which, in the linkages, the goal is an end) to the total frequency in the implication matrix, that is the sum of all its elements ( $n = 327$ ). The higher the score, the more the goal is an end to which people aspire. Increase in personal knowledge, but above all Better quality of life are the most profound reasons for using Internet (Table 3). The Centrality index, on the other hand, is equal to the ratio of the sum of "in degrees" plus "out degrees" to the total frequency in the implication matrix. It expresses the degree to which a goal is involved in linkages with other goals. The most central goal is Increase in personal knowledge: in five cases it is an end, in six cases it is a means which allows the realization of

**Table 2.**  
Implication matrix for the goals associated with the use of Internet

Abstractness ratio	Goals	1	2	3	4	5	6	7	8	9	10	Out degrees
0.08	1 Rapid and extended communication		7	0	0	10	33	1	3	2	4	60
0.16	2 Recent and rapid information	1		0	1	32	1	10	10	3	28	86
0.25	3 Democracy	0	0		0	0	0	0	2	0	1	3
0.46	4 Amusement	0	0	0		1	0	0	0	0	6	7
0.51	5 Increase in personal knowledge	1	8	0	1		6	8	20	10	16	70
0.59	6 Greater social relations	3	0	0	1	16		0	0	2	10	32
0.63	7 Professional self-expression	0	0	0	0	1	0		1	1	16	19
0.69	8 Self-expression	0	0	0	2	7	2	0		2	4	17
0.73	9 Keeping up with modern times	0	0	1	0	0	0	3	2		2	8
0.78	10 Better quality of life	0	1	0	1	6	5	10	0	2		25
	In degrees	5	16	1	6	73	47	32	38	22	87	327
	Mentions per goal	65	97	6	18	151	127	57	48	32	126	
	Number of people mentioning the goal at least once	52	69	5	13	69	61	35	39	25	60	
	Per cent	65.00	86.25	6.25	16.25	86.25	76.25	43.75	48.75	31.25	75.00	

*Note:* The numbers in the matrix express how often the goal indicated in the row leads to that indicated in the column. For example, Rapid and extended communication as a result of using Internet leads to Greater social relations in 33 instances. The measure in degrees indicates how often a goal was an end in the relations; the measure out degrees indicates how often a goal was a source or means. The goals have been ordered on the basis of the abstractness ratio.

other ends (Figure 1). In the cognitive structure, therefore, Increase in personal knowledge is central, the final goal is Better quality of life (Table 3).

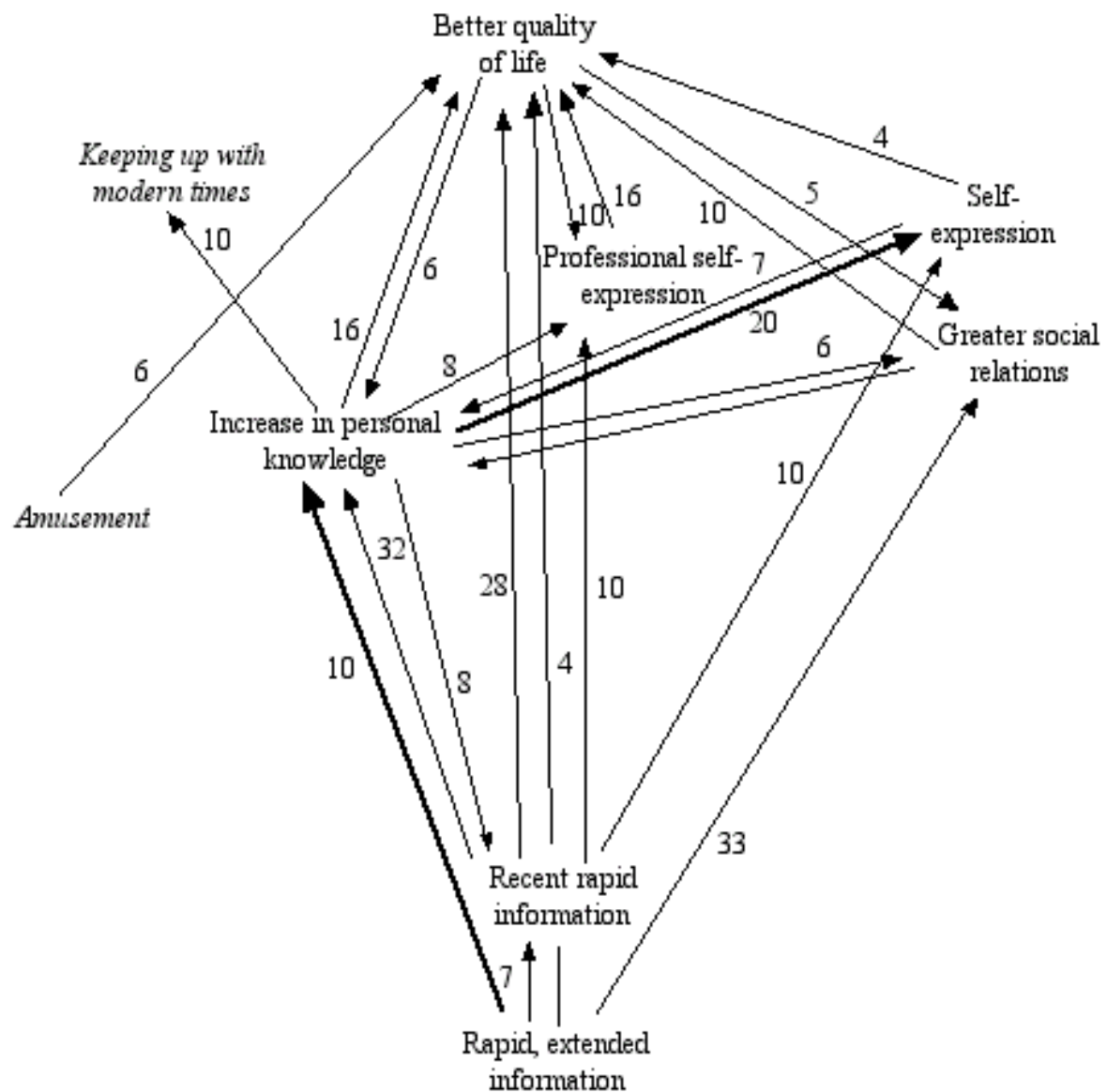


Figure 1  
Hierarchical structure of the linkages amongst the goals which can be achieved using Internet.

Note: The number besides the arrow indicates the frequency with which the designated linkage was mentioned (see Table 2). The two goals in italics and the two linkages, represented as bold arrows, determine the attitude of favour towards Internet (affective attitude).

### The sharing of Internet representation

To test the hypothesis that the representation of Internet, particularly the field of representation, was shared in the group examined, the following procedure was applied. The 80 implication matrices were randomly divided into eight groups of 10. For each group, the sum of

the 10 matrices was calculated. From the linkages of each group, the ones concerning Democracy were excluded, it being a category eliminated as a result of the cut-off operation;

**Table 3**  
Indices of Abstractness, Prestige and Centrality

Goals	Abstractness	Prestige	Centrality
Better quality of life	0.78	0.27	0.34
Keeping up with modern times	0.73	0.07	0.09
Self-expression	0.69	0.12	0.17
Professional self-expression	0.63	0.10	0.16
Greater social relations	0.59	0.14	0.24
Increase in personal knowledge	0.51	0.22	0.44
Amusement	0.46	0.02	0.04
Democracy	0.25	0.003	0.01
Recent and rapid information	0.16	0.05	0.31
Rapid and extended communication	0.08	0.02	0.20

*Note:* The goals are ordered on the basis of the abstractness index, from the highest to the lowest index.

therefore, the correlations amongst the eight matrices were calculated considering as a source of variation the remaining linkages ( $n = 72$ ). The correlation matrix amongst the subgroups was submitted to factor analysis (principal components model). Only the first component presents an eigenvalue higher than 1 (Kaiser-Guttman criterion). The one-dimensional nature of the structure shows the close affinity which exists between the matrices and, thus, a consensual representation of the relations present among the goals which can be achieved through the use of Internet. The degree of sharing is expressed by the portion of variance absorbed by the first factor; this portion is high, equal to 64.74 per cent of the total variance.

### The structure of attitude

To test the hypothesized two-factor structure of attitude confirmatory factor analysis was applied (Jöreskog & Sörbom, 1996, LISREL 8). The factor model includes six observed variables and two latent variables (see Figure 2 for the meaning of the factors and their relations to the observed variables). It was hypothesized that the scales pleasant/unpleasant ( $x_1$ ), beautiful/ugly ( $x_2$ ), agreeable/disagreeable ( $x_3$ ) express the affective component of attitude, whereas the scales beneficial/harmful ( $x_4$ ), wise/foolish ( $x_5$ ), useful/useless ( $x_6$ ) express the evaluative component.

The adequacy of the model was evaluated with the chi-square test: the solution is adequate when chi-square is non-significant ( $p \geq .05$ ). However, given the dependency of this statistic on sample size, other measures of fit were considered. The strategy of the two indices by Hu and Bentler (1997) was followed, that is we considered the standardized version (SRMR, Bentler, 1995) of the root mean squared residual (RMR, index proposed by Jöreskog & Sörbom, 1981), and the comparative fit index (CFI) by Bentler. SRMR permits simple models to be detected, that is, models which are misspecified with respect to factor covariances, CFI permits complex models to be detected, that is, models misspecified with respect to factor loadings (Hu & Bentler, 1999). In an analysis on the criteria to follow in the combined use of the two indices, Hu and Bentler (1999) suggested applying a cut-off value close to 0.95 for CFI in combination with a cut-off value close to 0.09 for SRMR. We used as criteria:  $CFI \geq 0.95$ ,  $SRMR \leq 0.08$ . (For further discussions regarding these indices, see Marsh, Balla & Hau, 1996; Marsh & Hau, 1996; Rigdon, 1996.)



The two-factor model fits the data well (Figure 3); in fact, the goodness-of-fit indices are:  $\chi^2(8) = 6.14, p = .63$ ; SRMR = 0.054; CFI = 1.00. The factor loadings are all significant and between

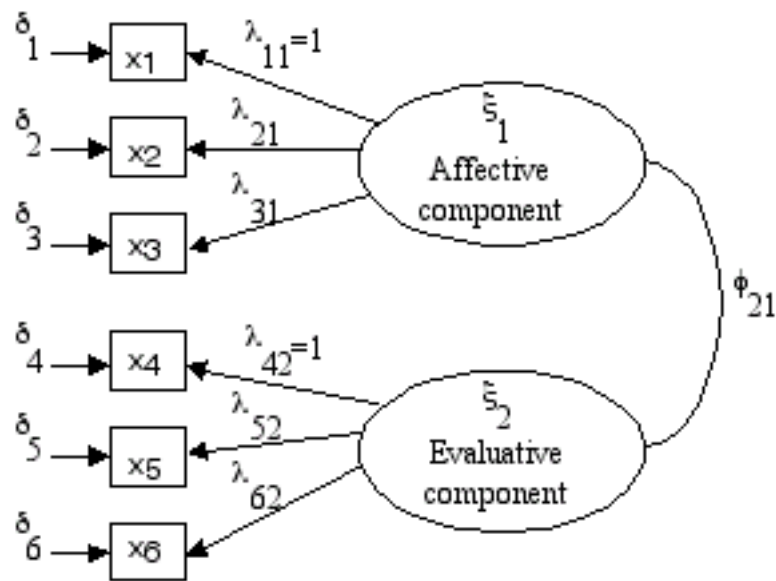


Figure 2  
Attitude structure: Confirmatory factor analysis.

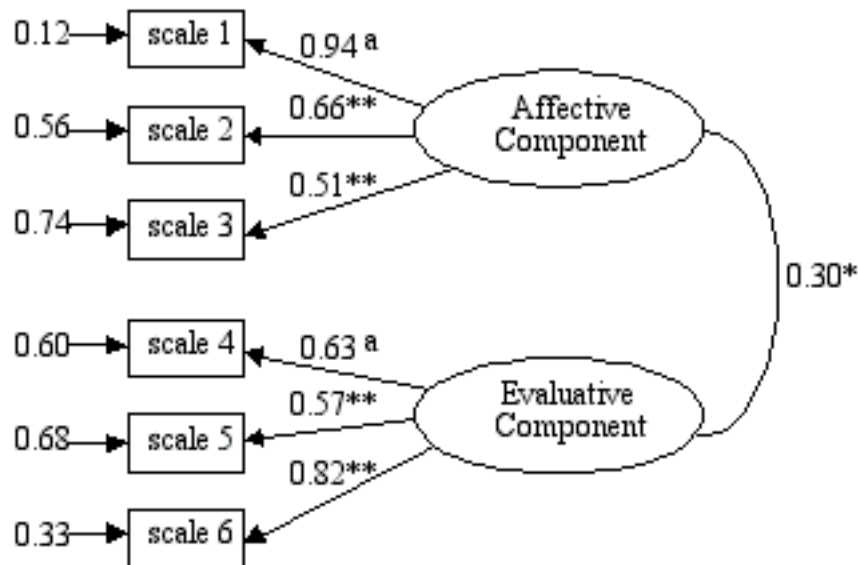


Figure 3  
Findings for test of the model of Figure 2.

\* indicates a fixed parameter; \* $p < .06$ ; \*\* $p < .001$ .

Note: The test of the model was carried out by using the covariance matrix. The standardized parameters are reported.

moderate and very high. Moreover, the two factors are only weakly correlated (the coefficient  $\rho_{21}$  is marginally significant,  $p < .06$ ). The one-factor model, instead, does not represent an adequate explanation of the relations which exist amongst the variables:  $\chi^2(9) = 42.84$ ,  $p < .00$ ; SRMR = 0.15; CFI = 0.66. Therefore, the hypothesis that attitude is organized into an affective and an evaluative component cannot be excluded.

Reliability of the measures was calculated by the use of the formula:  $\alpha = (\sum \lambda_i^2) / [(\sum \lambda_i^2) + \sum \sigma_i^2]$ , where  $\lambda_i$  is the  $i$ th factor loading and  $\sigma_i^2$  is the  $i$ th error variance (the standardized solution is assumed). The coefficient  $\alpha$  is similar to the coefficient alpha; the two measures are different because, in calculating  $\alpha$ , equal weight is not assigned to the items, which are weighted by their respective factor loadings (see, e.g., Bagozzi & Edwards, 1998). The  $\alpha$ s of the two factors indicate a satisfactory reliability: they are in fact, respectively, 0.76, for the affective component, and 0.72, for the evaluative one. The composite score, for the affective component, is  $M = 5.84$ , for the evaluative component  $M = 5.73$ ; both are different from the neutral point, namely from 4:  $t(79) = 19.00$ , for the affective component,  $t(79) = 16.46$ , for the evaluative one,  $p < .001$  in both cases. The use of Internet, therefore, is judged pleasant and useful.

### The cognitive determinants of attitude

To detect which goals and linkages between goals determine attitude, multiple regression was applied, considering as dependent variables the two components. In particular, the procedure developed by Appelbaum and Cramer (1974) for the evaluation of non-orthogonal designs was used (see Bagozzi & Edwards, 1998). A first stepwise regression was carried out wherein the dependent variable was the composite score of the affective component and the independent variables were the nine goals, namely the number of times they were mentioned by each respondent (Democracy was excluded from the analysis). The effect of three goals, which together account for 17 per cent of variance in affective attitude, was significant (see Table 4).

A second stepwise regression was then carried out, considering as independent variables the linkages ( $n = 23$ ; those mentioned by less than four participants were excluded). The effect of four linkages, which account for 22 per cent of variance in attitude, was significant (Table 4). To eliminate the problem of statistical dependency between goals and linkages, hierarchical regression was applied (see Appelbaum & Cramer, 1974). First, a multiple regression was conducted, considering as independent variables the goals (Model 1, Table 4) and linkages (Model 2, Table 4) which were significant in the stepwise regressions; goals and linkages (Model 3, Table 4) together account for 35 per cent of variance in attitude. To establish whether it is goals, linkages or both which have a determining effect, Model 1 and Model 2 were compared to Model 3, which includes them. The effect of linkages (Model 4) is tested by comparing Model 1 with Model 3; the effect of goals (Model 5) by comparing Model 2 with Model 3 (Table 4). The following expression of  $F$  was used (Formula 1):

$$F = \frac{(R_2^2 - R_1^2) / h}{(1 - R_2^2) / (N - k - 1)} \quad (\text{Formula 1})$$

In formula 1:  $R_2^2$  and  $R_1^2$  express the portion of variance in attitude explained, respectively, by Model 3 ( $R_2^2$ ), which includes goals and linkages, and by Model 1 or 2 ( $R_1^2$ );  $h$  is the difference in degrees of freedom between Model 3 and Model 1 or 2;  $N$  is the sample size;  $k$  is the number of independent variables in Model 3. The results indicate that both goals and linkages influence affective attitude (Table 4). In particular, from the significant  $\beta$ s (Model 3) it emerges that affective attitude is predicted by two goals: Amusement (standardized  $\beta = 0.37$ ,  $p$

< .02), Keeping up with modern times (standardized  $\beta = 0.22$ ,  $p < .03$ ), and by three linkages: Rapid and extended communication which leads to an Increase in personal knowledge (standardized  $\beta = 0.32$ ,  $p < .004$ ), Increase in personal knowledge which fosters Self-expression (standardized  $\beta = 0.27$ ,  $p < .009$ ), Increase in personal knowledge which leads to have Recent information (standardized  $\beta = -0.27$ ,  $p < .02$ ).<sup>2</sup> Thus, the components of the cognitive structure which lead to a favourable attitude towards Internet were specified.

**Table 4.**  
Test of model comparisons

Model	Dependent variable: affective attitude
1. Goals	
$R^2$	0.17
df	(3, 76)
2. Linkages	
$R^2$	0.22
df	(4, 75)
3. Goals plus linkages	
$R^2$	0.35
df	(7, 72)
4. Test of linkages	
F-value	5.16**
df	(4, 72)
5. Test of goals	
F-value	4.94*
df	(3, 72)

\*  $p < .01$ ; \*\* $p < .001$

Regarding the evaluative component, it is influenced by only one goal (Model 1) and by none of the linkages (Model 2). The goal: Internet allows Professional self-expression (standardized  $\beta = 0.23$ ,  $p < .04$ ) explains a very small portion of variance in attitude ( $R^2 = 0.05$ ).<sup>3</sup>

## Discussion

In this study we have proposed new methods to measure the components of a social representation. For the field of representation, the laddering technique was used; this is a technique which has recently been developed by Bagozzi and collaborators (see, e.g., Bagozzi & Dabholkar, 1996; Bagozzi & Edwards, 1998) to elicit cognitive schemas. In this way, we

<sup>2</sup> The negative sign of this last  $\beta$  coefficient does not depend on problems of multicollinearity. In fact, in the model tested, the VIF values ('variance inflation factor') are all lower than 10 (see Myers, 1990), the mean of the VIFs ( $M = 1.10$ ) is close to 1.00 (see Bowerman & O'Connell, 1990) and the tolerance statistics ( $1/VIF$ ) are all much higher than 0.20 (see Menard, 1995). The negative sign depends on a result not easy to interpret: the respondents who do not mention the linkage - Increase in personal knowledge  $\rightarrow$  Recent and rapid information - have a more favorable attitude towards Internet than the respondents who mention it,  $t(78) = 2.08$ ,  $p < .05$ .

<sup>3</sup> When the concept, evaluated on the semantic differential scales, is: The use of Internet, instead of My use of Internet, affective attitude is predicted by the following goal and linkages: Amusement; Rapid and extended communication which leads to Greater social relations; Rapid and extended communication which leads to an Increase in personal knowledge. The evaluative attitude is predicted by the linkage: Self-expression which leads to Better quality of life.

transferred an instrument, devised within the social cognition approach, to social representations; the close affinity between the two concepts (schema and field of representation) enables this generalization. When the object of representation is a technology, like Internet, both the schema and the field of representation are the hierarchical structure of the goals which can be achieved through its use. In the theory of social representations, however, the cognitive structure does not derive from individual processes of information elaboration, but is the result of continuous episodes of communication which lead to the construction of shared images in a social context.

We also proposed a procedure to establish whether the field of representation is shared in the group analysed (see also Capozza et al., 1995; Capozza, Robusto & Busetto 1999). To reduce the number of variables, the 80 implication matrices were divided into eight groups of 10; for each group, the sum of the 10 matrices was calculated. The correlations between the matrices obtained were factor analysed (principal components model). A single component was identified: there exists, therefore, a close affinity between the implication matrices; that is, in the group analysed there is a consensus regarding the goals which can be achieved through the use of Internet and the linkages among these goals. The high proportion of variance absorbed by the single factor (64.74 per cent) expresses the high degree of sharing in the group analysed.

It should be noted that the laddering technique (Bagozzi & Edwards, 1998) allows also the information component of the representation to be elicited (beliefs and knowledge concerning the object). This is an effective procedure because respondents are free to express their beliefs and are not forced to choose from a range of pre-established possibilities. Pre-establishing beliefs can result in a structure which does not fully reproduce the field of representation.

The proposal to use regression to uncover the connections which exist between attitude and cognitive structure is also new. The elements (goals and linkages) which lead to an evaluation of the use of Internet as pleasant (affective attitude) or wise (evaluative attitude) were identified. However, whilst the cognitive elements explain a substantial portion of variance of the affective attitude, they explain a very low portion of variance of the evaluative attitude. This finding may depend on the fact that, while constructing reasons for the pleasant aspects of an object is immediate, experience is needed to understand the reasons for its usefulness, and respondents had only recent experience in using Internet.

Thus, Internet allows people to communicate rapidly, to have up to date information available, to widen their personal knowledge; it allows amusement and extended social relations; it permits self-expression. These goals, concrete and intermediate in the hierarchical structure, all contribute to the achievement of an ultimate goal: improving the quality of life (see the high Prestige index of this goal in Table 3). Such an image is interesting for a technology of recent diffusion. In this study respondents were users of Internet, at least occasional users, and in favour of its use; their beliefs could be a point of reference in promoting the diffusion of this technology which offers manifold opportunities. Of course, for suggesting communication strategies, it would be useful to know the belief structure of people who refuse the use of Internet. This assessment will be the aim of further studies, carried out using the procedures which have been proposed in the present paper.

## References

- Ajzen, I. (1996). The social psychology of decision making. In E.T. Higgins & A.W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 297-325). New York: Guilford.

- Ajzen, I. & Driver, B.L. (1991). Prediction of leisure participation from behavioral, normative, and control beliefs: An application of the theory of planned behavior. *Leisure Sciences*, 13, 185-204.
- Anderson, J.R. (1983). *The architecture of cognition*. Cambridge, MA: Harvard University Press.
- Appelbaum, M.I. & Cramer, E.M. (1974). Some problems on the nonorthogonal analysis of variance. *Psychological Bulletin*, 81, 335-343.
- Bagozzi, R.P. & Dabholkar, P.A. (1996). Structure and function of political person perceptions: The public's view of President Clinton. Unpublished paper, The University of Michigan.
- Bagozzi, R.P. & Edwards, E.A. (1998). Goal setting and goal pursuit in the regulation of body weight. *Psychology and Health*, 13, 593-621.
- Bagozzi, R.P., Lee, K.H. & Van Loo, M.F. (2001). Decisions to donate bone marrow: The role of attitudes and subjective norms across cultures. *Psychology and Health*, 16, 29-56.
- Bentler, P.M. (1995). *EQS structural equations program manual*. Encino, CA: Multivariate Software.
- Bonnes, M. (1999) (Ed.). *Moscovici. La vita, il percorso intellettuale, i temi, le opere*. Milano: Angeli.
- Bowerman, B.L. & O'Connell, R.T. (1990). *Linear statistical models: An applied approach* (2<sup>nd</sup> edition). Belmont, CA: Duxbury.
- Capozza, D., Cesco, V., Dazzi, C., Voci, A. & Martines, D. (1999). Verifica di teorie delle intenzioni tramite modelli di equazioni strutturali. *Testing Psicometria Metodologia*, 6, 133-146.
- Capozza, D., Robusto, E. & Busetto, G. (1999). La représentation sociale du leadership. *Papers on Social Representations*, 8, 1-18. [<http://www.psr.jku.at/>]
- Capozza, D., Robusto, E., Squarza, R. & De Carlo, N. A. (1995). La représentation sociale de l'argent. *Papers on Social Representations*, 4, 85-104. [<http://www.psr.jku.at/>]
- Crites, S.L., Fabrigar, L.R. & Petty, R.E. (1994). Measuring the affective and cognitive properties of attitudes: Conceptual and methodological issues. *Personality and Social Psychology Bulletin*, 20, 619-634.
- Doise, W., Clémence, A. & Lorenzi-Cioldi, F. (1993). *The quantitative analysis of social representations*. Hemel Hempstead: Harvester Wheatsheaf.
- Faust, K. & Wasserman, S. (1992). Centrality and prestige: A review and synthesis. *Journal of Quantitative Anthropology*, 4, 23-78.
- Fiske, S.T. & Taylor, S.E. (1991). *Social cognition* (2<sup>nd</sup> edition). New York: McGraw Hill.
- Freeman, L.C. (1979). Centrality in social networks: Conceptual clarification. *Social Network*, 1, 215-239.
- Galli, I. & Nigro, G. (1992). La représentation sociale du pouvoir chez les enfants. *Bulletin de Psychologie*, 45, 217-222.
- Hu, L. & Bentler, P.M. (1997). Selecting cutoff criteria for fit indexes for model evaluation: Conventional versus new alternatives (Tech. Rep.). Santa Cruz: University of California.
- Hu, L. & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Jodelet, D. (1984). Représentation sociale: Phénomènes, concept et théorie. In S. Moscovici (Ed.), *Psychologie sociale* (pp. 357-378). Paris: Presses Universitaires de France.
- Jodelet, D. (1989). Représentations sociales: Un domaine en expansion. In D. Jodelet (Ed.), *Les représentations sociales* (pp. 31-61). Paris: Presses Universitaires de France.
- Jöreskog, K.G. & Sörbom, D. (1981). *LISREL 5: Analysis of linear structural relationships by the method of maximum likelihood*. Chicago: National Educational Resources.

- Jöreskog, K.G. & Sörbom, D. (1996). LISREL 8 user's reference guide. Chicago: Scientific Software International.
- Le Bouedec, G. (1984). Contribution à la méthodologie d'étude des représentations sociales. *Cahiers de Psychologie Cognitive*, 4, 245-272.
- Marsh, H.W., Balla, J.R. & Hau, K.-T. (1996). An evaluation of incremental fit indices: A clarification of mathematical and empirical properties. In G.A. Marcoulides & R.E. Schumacker (Eds.), *Advanced structural equation modeling: Issues and techniques* (pp. 315-353). Mahwah, NJ: Erlbaum.
- Marsh, H.W. & Hau, K.-T. (1996). Assessing goodness of fit: Is parsimony always desirable? *The Journal of Experimental Education*, 64, 364-390.
- Menard, S. (1995). *Applied logistic regression analysis*. Sage university paper series on quantitative applications in the social sciences, 07-106. Thousand Oaks, CA: Sage.
- Moscovici, S. (1961/1976). *La psychanalyse: Son image et son public*. Paris: Presses Universitaires de France.
- Moscovici, S. (1981). On social representations. In J.P. Forgas (Ed.), *Social Cognition* (pp. 181- 210). London: Academic Press.
- Moscovici, S. (1984). The phenomenon of social representations. In R. Farr & S. Moscovici (Eds.), *Social representations* (pp. 3-70). Cambridge: Cambridge University Press.
- Moscovici, S. & Markova, I. (1998). Presenting social representations: A conversation. *Culture and Psychology*, 4, 371-410.
- Myers, R. (1990). *Classical and modern regression with applications* (2<sup>nd</sup> edition). Boston: Duxbury.
- Pervin, L.A. (1989). Goal concepts: Themes, issues, and questions. In L.A. Pervin (Ed.), *Goal concepts in personality and social psychology* (pp. 473-479). Hillsdale, NJ: Erlbaum.
- Rigdon, E.E. (1996). CFI versus RMSEA: A comparison of two fit indexes for structural equation modeling. *Structural Equation Modeling*, 3, 369-379.
- Trafimow, D. & Sheeran, P. (1998). Some tests of the distinction between cognitive and affective beliefs. *Journal of Experimental Social Psychology*, 34, 378-397.